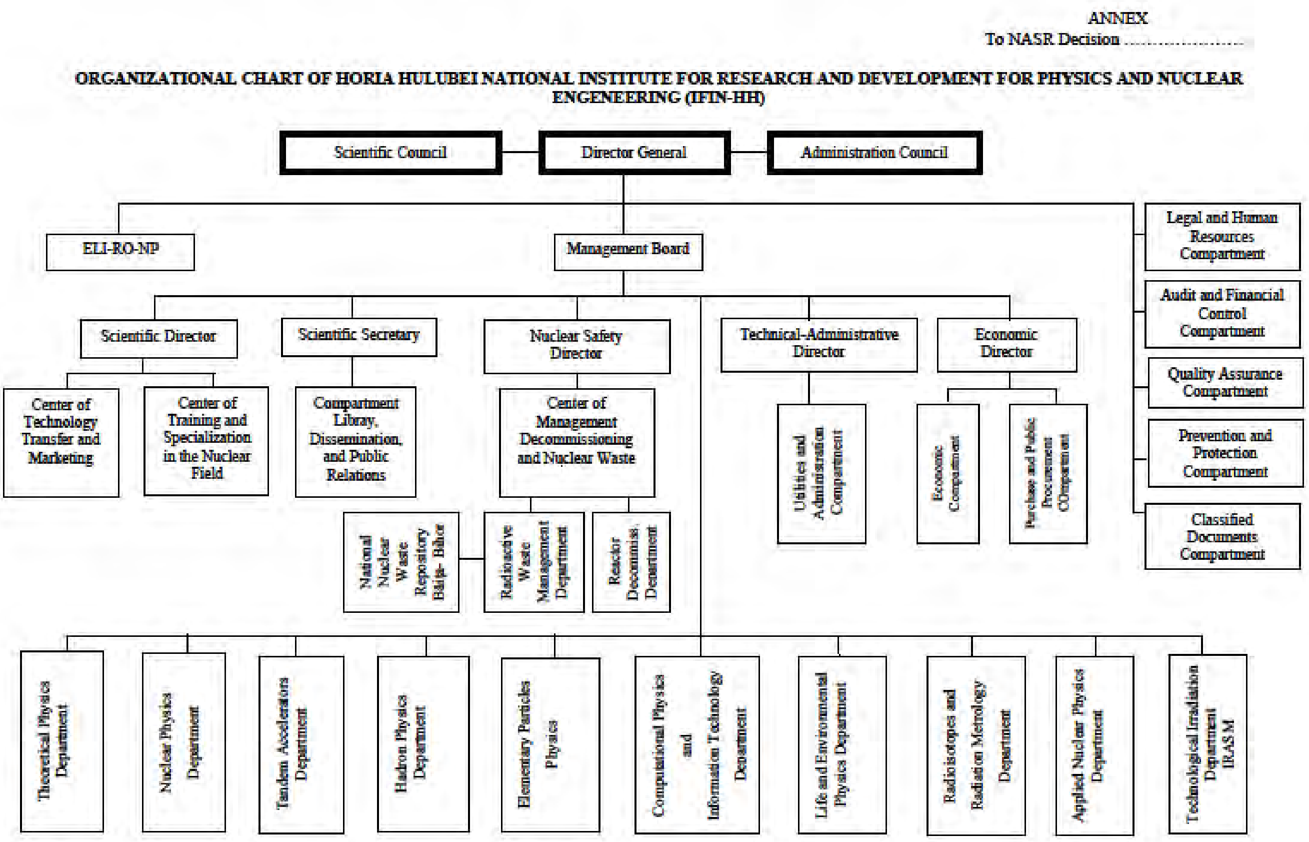
SELF-ASSESSMENT REPORT
AND INSTITUTIONAL DEVELOPMENT PLAN

2. Self-assessment report for the previous 4 years

2.1. Administrative structure diagram of the institution

The diagram will include the management structure, the scientific council, the various departments, research labs or groups, as well as the technical or auxiliary support structures.



2.2. General activity report of the institution

The largest R&D institute in Romania – in terms of assets and personnel, *'Horia Hulubei' National Institute of Physics and Nuclear Engineering* (IFIN-HH) covers almost 10% of the national scientific output. The institute addresses a comprehensive spectrum of research and development activities in fundamental and applied Nuclear Physics and in related areas including Astrophysics, Particle Physics, Atomic Physics, Life and Environmental Physics, Theoretical Physics, Nuclear Techniques, and Advanced Communication Systems. Featuring a variety of facilities of national interest, including a Tandem Van de Graff accelerator, a Cyclotron, a Multipurpose Irradiation Facility Center, a Radioactive Waste Processing Plant, National Radioactive Waste Repository, the institute is an important part of the Romanian research infrastructure. IFIN-HH consists of 12 departments (http://www.nipne.ro/research/departments/) and 15 certified laboratories within these departments (http://www.nipne.ro/facilities/laboratories/).

While focusing its mission on advanced investigations in atomic and sub-atomic Physics, IFIN-HH was also committed to widening the positive impact of the Nuclear on industry, other business areas, as well as on the society at large, via a diversified offer of unique professional services. Various applications of nuclear physics and technology enable the institute to not only to play an active role as promoter of domestic progress and modernity, but also to bring a significant contribution to the public acceptance of the Nuclear.

To turn its strength to the best account, the institute has concentrated its resources on two directions: (i) to steadily develop a sound in-house capability to get and stay in the forefront of the current nuclear science and technology; and (ii) to substantively participate in the European collaborative endeavors centered on Large Scale Facilities such as GSI-Darmstadt (Germany), GANIL-Caen (France), CERN (Geneva), JINR (Dubna). This was and is still believed to be a common-sense and mitigative strategy meant to harmonize limited domestic resources with the tall orders of the contemporary, top-level nuclear physics research, and the imperative need for Continental co-operation and integration. Along these lines, IFIN has successfully participated over the past 4 years in more than 200 national projects and in more than 20 international projects of the European Commission's Framework Programmes 6 and 7.

It is worth mentioning that during 2010, notwithstanding the international economic crisis, Romania, through IFIN-HH, succeeded to fulfill three most outstanding research projects: joining as founding members the FAIR and ELI pan-european projects and becoming a candidate for acception as CERN member-country.

There are several major achievements in the last four years:

- Excellent research at international level (over 300 articles per year in international journals)
- increasing the share of applied research and turning the results to good account via certified services (15 new laboratories, RHODOS, Kit for emergency planning and decision making, etc)
- starting the decommisioning process of the nuclear research reactor and forming a competent team in the field.
- efficient, substantial participation in the major nuclear and subnuclear physics projects going on at Europe’s main experimental facilities, both under EU Framework Programs and other international collaborations
- attaining symmetric mobility and reciprocity in academic exchanges with other countries
- improving the status of the IFIN-HH facilities of national relevance and integrating them in the emerging structure of Small-Scale European Facilities

- improving the contribution at the activities of the European academic structures (NuPECC, APECC, EPS, IUPAP)
- ellaborating the Strategy of the institute (2007) and the Strategy of Nuclear Physics in Romania (2011)

The investements in the last four years can be grouped in four categories:
- Renewing the general infrastructure (utilities, buildings)
- substantially improving the research infrastructure including 15 new certified laboratories for nuclear activities, the Tandem van de Graaff accelerator, Radioactive Waste Processing Plant and National Repository
- New laboratories dedicated to collaborations with FAIR (NUSTAR and CBM) and to radiological environmental studies
- New accelerators dedicated to applications of nuclear techniques (1 MV Tandetron dedicated to Accelerator Mass Spectrometry, 3 MV Tandetron dedicated to Ion Beam Analysis and 19 MeV Cyclotron dedicated to radiopharmaceutical studies).

Securing a solid and competitive pool of research staff has been the main objective followed by the management of the institute during the whole period of time. In this respect, the operative Human Resources Policy and Recruitment activities have been built on two major components:

1. Constantly employing of college graduates on research assistants positions and encouraging them, even from the beginning, to follow the PhD programmes. The graduates have been offered concrete and unique possibilities by the institute, such as: entering into PhD programmes under the direct coordination of the senior scientists working in the institute and being members of research teams conducting research projects including the PhD thesis thematic; participating at national and international collaboration and being part of inter/ multidisciplinary teams of scientific research, benefiting from the scientific expertise, knowledge and infrastructure of the institute; social and financial support (such as housing facilities, scholarships). The annual number of research assistants has been kept in the same range (80-100) through the whole period 2007-2011 due to the fact that the ones obtaining the PhD thesis and promoting in the positions of junior researchers were constantly being replaced by at least the same number of graduates.

2. Organizing several recruitment competitions per year for junior and senior researchers as a method through which two important accomplishments are being achieved: promoting the existing staff to higher research positions and attracting research staff from abroad, mainly Romanian researchers who have completed specific training programmes in various fields of research related to the research directions of the institute. During 2007-2011, a number of 21 competitions for experienced research staff have been organized and successfully finalized (10 for junior researchers, eight for senior researchers, seven for junior engineers of technological development and six for senior engineers. In this context, a number of 116 positions of junior and senior researchers have been occupied during 2007-2011 as a result of the competitions, including both the promotion of the existing research staff and the employment of new researchers from abroad, the latter consisting mainly of Romanian researchers returning to Romania after the completion of various forms of specific training (such as doctoral and postdoctoral fellowships) or after finalizing their work in different fields of scientific expertise.

An important component which has been developed during this time is the one related to the new type of positions introduced by the relatively recent law regulating the statutes of the research personnel: technological development Engineers and Technicians. Due to the lack of an appropriate law in establishing specific requirements and skills for these positions, special efforts have been allocated to elaborate a set of regulations comprising selection and evaluation criteria in hiring and promoting these types of personnel. Starting with the existing practices and needs and taking advantage of having inside the institute a recognized and experienced Training Center, the competition rules for hiring and promoting both types of personnel have been already demonstrated its efficiency in practice (13 finalized competitions for engineering staff and 10 ongoing competitions for technicians).

Another important accomplishment in the field of attracting and recruitment scientific staff is the one related to the return of junior researchers of the institute after the completion of specific trainings abroad lasting at least one year, as a result of the attractiveness of the research environment established in IFIN-HH due to the improvement of the research infrastructure (equipments, facilities, offices etc.) and also to the competitive remuneration established in accordance with the involvement in R&D projects.

The technology transfer activity was carried out both independently and together with other related tasks such as dissemination of information, PR and through the library department). The Center of Technology Transfer and Marketing was established since mid-2011.

- Assistance for technology transfer and marketing
  - Market research studies;
  - Promoting certain products or services belonging to the Institute;
  - Counseling about the advertising of such products or services;
  - Access to means of promotion and advertising such as trade fairs, exhibitions, etc.

- Activities for promoting the image of the Institute:
  - Developing promotional materials (brochure of the Institute, leaflets, posters, data sheets and video presentations for products and services based on discussions held with researchers);
  - Updating the web page with information on accredited laboratories and rendered services;
  - Achieving the necessary material presentation of the research Institute in the White Paper;
  - Drawing up the database processed and structured by the designer and IT specialists in order to obtain attractive presentations.

- Participation in fairs and exhibitions:
  - Organizing the IFIN-HH booth;
  - Product training presentations, according to each specific exhibitions;
  - Meetings and discussions with potential domestic and foreign clients, meetings with officials.

  Attended exhibitions:
  - Internationally: Hannover Messe Industrial Fair International (2008, 2010, 2011), Germany, Research Fair in Paris (2008), France, Prentice Hall in Geneva (2011), Switzerland salon in Brussels (2011), Belgium. During these exhibitions, Romanian inventors of the Institute have received many awards and medals, as well as some high praise from the foreign officials.
  - Domestic: Attending annual national shows such as “Research Fair”, 2007-2011; Participating to Bacau Research Salon 2011; Organizing CERN’s 2011exhibition in Bucharest.

- Preparing a set of procedures (undergoing) aimed at putting the base for an efficient technology transfer with rules and regulations for the products and services’ listing and potential users’ identification.

IFIN-HH is regularly organizing scientific events of national and international level – conferences, workshops, seminars a.s.o. - covering the main research themes in its domains of expertise (http://www.nipne.ro/events/conferences/), highlighting its involvement in the major contemporary international collaborations and illustrating the wide spectrum of activities pursued in Nuclear Physics and related areas, from fundamental research to specific applications of societal interest. As examples we may quote the March 2011 ELI-NP Workshop “The Way Ahead”, with the participation of most of the outstanding personalities in laser- and nuclear physics, aand also in the same year, the July R2D2P, organized jointly with the International Atomic Energy Agency, Vienna, the meetings of the European Committee for Future Accelerators, organized jointly with CERN (July) and the Meeting on Tritium Accidents - EMRAS II - Approaches for Assessing Emergency Situations Working Group 7 (September). Also during September 2011, the CERN-JINR European School of High-Energy Physics was held at Cheile Gradistei and the CERN Exhibition was organized by IFIN-HH in Bucharest.

It is worth mentioning that IFIN-HH is also hosting and fully supporting the activities of the National Physics Library and the editorial offices of the physics journals Romanian Reports in Physics and Romanian Journal of Physics (ISI Impact Factor 0,494 and 0,340, respectively), thus playing a major role as promotor of both scientific information for as well as of the achievements of the Romanian physics community as a whole.

Committed to its role as science communicator, IFIN-HH hosted the live broadcasting of the LHC inauguration (October 2008) and was an important source of information (results and estimates on its site) during the 2011 Fukushima Earthquake and Nuclear Accident. Also since 2010 it developed various communication activities related to the ELI-NP project, the Romanian participation to the CERN research program at LHC and to other major research infrastructures and collaborations (FAIR, SPIRAL2, JINR a.o.).

During 2007-2011, IFIN-HH was an active presence in TV and Radio programs: TVR, ProTV and Antena 1, Realitatea TV and Radio Romania (Actualitati, Cultural, Bucuresti FM).

At the initiative of IFIN-HH, three events (in 2007, 2008 and 2010) were organized at the Romanian Parliament under the title “FAPT - Physics, Business, Politics, Technology”, offering the possibility to meeting together of the most important factors defining science research and applications in any country: members of the scientific, political, business and high technology communities.

IFIN-HH has organized every year since 2009 a Science Fest (usually in the frame of the European event “Researchers Night”), attended by thousands of visitors, thus offering the general public the opportunity to watch and participate directly in live science experiments. It has also been the co-organizer (2008 and 2010) of two meetings with the Romanian scientific diaspora. In 2011 IFIN-HH organized together with the Bucharest Central University Library the first presence in Romania of the CERN Exhibition. It hosted regularly documentary visits of faculty and school students.

IFIN-HH has initiated and produced during 2007-2011 a wealth of promotional activities - documentary films, brochures, posters, exhibitions - presenting the activity and the most important results of its Departments as well the milestones of the more than 60 years of Physics history at Magurele.

2.3. Activity report by team

2.3.1. E-1: Dynamics of Open Nuclear Systems Team Activity Report (2007-2011)

2.3.1.1. Introduction

One of the most active fields of the modern nuclear physics is the investigation of exotic nuclear systems, like proton/neutron rich nuclei by using radioactive beams and fission, or superheavy elements through fusion, α-decay, proton or two-proton emission processes. An intense research activity of exotic nuclei is performed in many international laboratories (GANIL-Caen, GSI-Darmstadt, JINR-Dubna). Most of these nuclei are weakly bound systems of few nucleons, coupled to a relatively more stable core. Proton-neutron pairing interaction was also intensively investigated, but still the interplay between isovector and isoscalar pairing was nor clarified. Nuclear reactions were studied in the last decade. One of the most intriguing aspects is the connection between the nuclear dynamics and the statistical regime. Therefore, concepts as friction or thermalization were introduced in this field. In the low energy domain, where the velocity of the nucleons in the mean field are much greater than the velocities for the modifications of the generalized coordinates, the quantum statistic must intervene. Up to now, a clear response was not given to the modality in which the dissipation energy intervenes in a quantum assembly. The first step to be overcome is to write down of some time dependent equations for the intrinsic variables. To do that, the variational principle can be used or the Heinsenberg form of the equations of motion.

2.3.1.2. Present status of experimental research, theoretical understanding

I. The α-particle, as the lightest shell structure, has enough large binding energy to "survive" as a correlated cluster in various nuclei [1]. Nuclear matter calculations revealed that α-particles can exist only at densities below 10% of the nuclear equilibrium density. Thus, α-particles can appear only at small densities in the nuclear surface region.

- Hindrance factors corresponding to α decay from two quasiparticle isomeric high K states were evaluated in superheavy nuclei [2]. We found that the hindrance factors are very sensitive to the deformations and, therefore, they may constitute a powerful tool to extract spectroscopic information in these nuclei. The hindrance factors turn out to be very large, specially for nonaligned configurations. This indicates that if one of such states is reached the parent nucleus may become isomeric.

- The analysis of experimental reduced widths evidenced a clear dependence upon the difference between the Coulomb barrier and Q-value. Such a relation was derived by supposing an α-cluster, described by a Gaussian on the nuclear surface [3]. We have shown that it is fulfilled by all emission processes (proton emission, alpha and cluster decay).

- In a recent paper [4] there were evidenced in ^{212}Po exotic non-natural parity states: 4^-, 6^-, 8^-, connected to the usual natural parity states 4^+, 6^+, 8^+ by strong E1 transitions. Moreover, the intra-band E2 transitions predicted by shell model calculations are by one order of magnitude lower than experimental values. Thus, an important α-cluster component should exist on the surface of heavy nuclei and theoretical investigations are necessary.

- Proton-neutron (p-n) correlations above the Z=50 shell closure were investigated with the aim of understanding the behavior of the 2^+ and 4^+ states in Te and Xe isotopes, which remain at a rather constant energy as one approaches the shell closure at N=50 [5]. Our calculations reveal that standard QRPA calculations, involving quadrupole-quadrupole (QQ) interaction with constant strengths, cannot explain this feature. It turns out that an increased p-n QQ interaction increases the collectivity (i.e., B(E2) values) when approaching the N=50 region, whereas an increased p-n pairing interaction decreases the collectivity. Thus the ratio between the B(E2) value and 2^+ energy is a “fingerprint” of p-n collectivity and it should be determined in future experiments concerning light Te isotopes. Based on this criterion, we concluded that the available experimental data indicate an enhanced p-n pairing interaction by approaching doubly magic Z=N=20 and Z=N=28 regions.

II. In principle, the time dependent Hartree-Fock approximation treats the residual interactions exactly only if the mean field is allowed to break all symmetries. Such approximation leads to huge computational difficulties. To solve this problem, in general, two dynamical approaches are used. On one hand, the generator coordinate method assumes that the internal structure of the evolving systems is equilibrated at each step of the collective motion. Some attempts were realized to extend the time dependent Hartree-Fock method to include collision terms. These approximations were developed and lead to the extended mean field and to the stochastic time dependent Hartree-Fock equations. In this context, we can mention results:

- The fine structure in the fission cross section was explained with dynamical single particle effects, without appealing to the triple humped barrier. An excellent agreement with experimental data was obtained in the Th region [6].

- The time dependent pairing equations were generalized by including the Landau-Zener effect. A new time dependent system of coupled channel equations for mixing seniority one configurations was deduced. It is demonstrated that The Landau-Zener equation for systems without residual equations and the time dependent pairing equations (generically named also time dependent Hartree Fock Bogoliubov equations) are two particular cases of the new system. The formalism is valid for anty kind of mean field approximation that includes a monopole pairing field. The new equations give the possibility that the system reaches the ground state after the disintegration for seniority one nuclear systems [7].

- Realization of the superasymmetric versions of the two-center shell model based on modified oscillators and Woods –Saxon potentials. The first version of the two center model was made by developing the Nilsson model. It was proved able to treat extreme mass asymmetries compatible to cluster decay as superasymmetric fission [8,9,10]

- A new dynamical pair breaking effect that explains the odd-even effect in cold fission was evidenced. This new effect take into account the rearrangement of the nuclear levels during the large amplitude deformation of the nucleus. The interaction in the avoided crossing regions produces the pair breaking, as in the case of the level slippage phenomenon [11].

2.3.1.1 D.S. Delion, *Theory of particle and cluster emission*, Springer-Verlag, Berlin (2010).

2.3.1.2 D.S. Delion, R.J. Liotta, R. Wyss, Physical Review C **76**, 044301 (2007).

2.3.1.3 D.S. Delion, Physical Review C **80**, 024310 (2009).

2.3.1.4 A. Astier, P. Petkov, M.-G. Porquet, D.S. Delion, P.Schuck, Phys. Rev. Lett. **104**, 042701 (2010)

2.3.1.5 D.S. Delion, R. Wyss, R.J. Liotta, Bo Cederwall, A. Johnson, and M. Sandelius, Physical Review C **82**, 024307/1-8 (2010).

2.3.1.6 M. Mirea, et al., Physical Review C **76**, 064608 (2007)

2.3.1.7 M. Mirea, Physical Review C **78**, 044618 (2008)

2.3.1.8 M. Mirea, D. S. Delion and A. Sandulescu, EPL **85**, 12001 (2009)

2.3.1.9 M. Mirea, D.S. Delion and A. Sandulescu, Physical Review C **81**, 044317 (2010)

2.3.1.10 M. Mirea, A. Sandulescu, and D.S. Delion, Nuclear Physics A **870-871**, 23 (2011)

2.3.1.11 M. Mirea, Physics Letters B **680**, 316 (2009)

2.3.2. E-2: apoma Laboratory of Condensed Matter and Theoretical Physics

Activity Report (2007-2011)

2.3.2.1. Presentation

Team #2 DTP-IPNE (Department of Theoretical Physics-Institute for Physics and Nuclear Engineering) consists at present of two retired 1st class researchers (N. Angelescu, M. Bundaru), one 1st class part-time researcher (F. Buzatu, age 54, 2 hours per day), one 3rd class researcher (L. Cune, age 40) and the team leader M. Apostol (MA, 1st class researcher, age 62). The main activity lies in Theoretical Physics, Condensed Matter Physics and Multidisciplinary Physics, together with collaborators from other Institutes of Research at Magurele-Bucahrest (E. Preoteasa, G. Vaman – IPNE, M. Ganciu – Institute of Materials, M. Nedelcu – retired, O. Dobrescu – University of Bucharest, etc). The activity of team #2 can be found at http://www.theory.nipne.ro/CMP/ and http://www.theory.nipne.ro/~apoma/

2.3.2.2. Quantitative activity

During 2007-2011 MA has published 19 papers in international ISI (Institute for Scientific Information, Thomson-Reuters) journals and 10 papers in Romanian journals, a few of them with his collaborators (see above). MA has also published cca 40 papers in his own J. Theor. Phys. ("non-accredited", free at http://www.theory.nipne.ro/CMP/jtp.html), a few with the same collaborators, and 11 books in his own ("non-accredited") publishing house ***apoma*** (http://www.theory.nipne.ro/CMP/books.html). During 2007-2011 MA has given 8 talks at the General Seminar of the IPNE and Institute for Atomic Physics at Magurele-Bucharest. In line with his capacity of Professor of Theoretical Physics, MA continues to hold, for those interested, a General Seminar (since 1985) and a Special Seminar (since 1994) within the ("non-accredited") ***apoma*** Laboratory of Condensed Matter and Theoretical Physics at Magurele-Bucharest.

L. Cune is the author of an original, published theory of matter aggregation, accounting for the formation of nanostructures and large supra-molecular aggregates. This is the only consistent theory for nanostructures, being a great achievement of the Condensed Matter theory. F. Buzatu is co-author (with international co-authors) of a theoretical description of phase transitions in latticial liquids. N. Angelescu and M. Bundaru deal with specific problems in Mathematical Physics (usually with international co-authors). These members of the team add another 5 publications in international ISI journals during 2007-2011. The collaboration within the team proceeds by discussions, seminars, cross-checking of the results, etc.

2.3.2.3. Qualitative activity

The main achievements of team #2 DTP-IPNE (MA):

1 explanation of the van der Waals isotherms, a famous subject of classical physics (2.3.2.2)

2 quantum transitions in non-inertial motion, explanation of the impossibility of quantizing the gravitation (not the gravitational waves) (2.3.2.4,5)

3 explanation and derivation of the correct quanta of conductance (2.3.2.6)

4 the new concept of densitons in liquids, explaining spectroscopic anomalies in light scattering (2.3.2.14,16)

5 a new concept of pulsed thermoelectricity, with great potential practical applications (2.3.2.11,24)

6 a new phase transition in polarizable matter, due to quantum phases, explaining formation of new entities called coherence domains (to be seen, 2.3.2.15))

7 a new method in classical electromagnetism, by which the polariton dynamics has been explained (reflection, refraction, surface plasmons and plasmon-polaritons, light

scattering on small particles, nano-plasmonics), as well as the molecular forces (van der Waals-London-Casimir) (2.3.18-2.3.23, 2.3.2.24,26)

8 the new concept of pulsed polariton in electron acceleration by high-intensity laser beams; the impossibility of nuclear gamma laser; X- and gamma coherent rays from Compton backscatering by the pulsed polariton; explanation and description of electron-positron pairs created from vacuum (the later being a famous, unsolved until now, subject in Quantum Electrodynamics) (2.3.2.27-20).

The last four points under #8 have been done in connection with the envisaged Extreme Light Infrastructure project of research to be developed at Magurele-Bucharest. One of these achievements has been highlighted by the Editors of the J. Appl. Phys. (http://jap.aip.org/, highlights January 2011).

2.3.2.4. Dynamics of research and research subjects, evolution of resources

Some of the research subjects approached by the team are 'hot" subjects, of great, current interest, amenable to the methods of the Theoretical Physics. However, the main thrust is directed, especially by MA, toward more basic subjects, of a larger breath and relevance. Very likely, the activity will diminish in quantitative terms in the next years, by natural causes. During 2007-2011 the team has not have any funded research project. MA failed recently to get by competition a research project, since the international referees of the funding body of the Romanian Government found MA's scientific activity not very visible internationally. In the vision of these referees, endorsed by the Romanian Government, the international visibility consists in the presence of foreign co-authors on publications. The human resources will get more scarce in the next future, not in the least because of the, comparatively, high professional standards imposed by the team leader, standards which the Romanian research authorities disavow. A young member-to-be of the team, with an American doctorate, has been removed recently from the institute, being jobless now, due to lack of activity. Similarly, a young research assistant, member-to-be of the team, has also been removed recently from the institute. The team has no notable international collaboration, due, mainly, to the team leader who preferred to try and develop his own important research subjects.

2.3.2.5. Others

MA is the recipient of the Institute Annual Award for Achievement (2008) and the Institute for Atomic Physics' Honor Award and Medal (2009).

References

2.3.2.1 Elastic scattering in short-range potentials, **M Apostol**, Roum. Reps. Phys. **59** 5 (2007

2.3.2.2 The condensation of matter-a model of phase transition of the first kind, **M Apostol**, Mod. Phys. Lett **B21** 893 (2007

2.3.2.3 Hadronization of the quark-gluon plasma, **M Apostol**, Roum. Reps. Phys. **59** 249 (2007)

2.3.2.4 Covariance, curved space, motion and quantizatioon, **M Apostol**, Progr. Phys. **1** 90 (2008) 2.3.2.5 Quantum transitions by change of parameters and in non-inertial motion, **M Apostol**, Res. Lett. Phys. Doi:10.1155/2008/570167 (2008

2.3.2.6 A new approach to the quantized electrical conductance, **M Apostol**, Phys. Lett. **A372** 5093 (2008)

2.3.2.7 On the gas-liquid transition, **M Apostol**, Roum. J. Phys. **53** 431 (2008)

2.3.2.8 Weber's coherent scattering and neutrino detection, **M Apostol**, Roum. Reps. Phys. **60** 315 (2008)

2.3.2.9 Electric flow through a ferromagnet-superconductior junction, Oana Ancuta Dobrescu, L. C. Cune and **M. Apostol**, Roum. Reps. Phys. **60** 327 (2008

2.3.2.10 Ferromagnet-superconductior junction, Oana Ancuta Dobrescu, L. C. Cune and **M. Apostol**, Roum. Reps. Phys. **60** 353 (2008)
2.3.2.11 Generalized theory of thermoelectric figure of merit, **M Apostol**, J. Appl. Phys. **104** 053704 (2008)
2.3.2.12 On some experimental observations of quantal beats in positronium three- and two-gamma annihilation in magnetic field, **M Apostol** and I Vata, Roum. Reps. Phys. **60** 453 (2008)
2.3.2.13 A model for the thermodynamics of simple liquids, **M Apostol**, Physica **B403** 3946 (2008)
2.3.2.14 Density oscillations in a model of water and other similar liquids, **M Apostol** and E Preoteasa, Phys.&Chem. Liquids **46** 653 (2008)
2.3.2.15 Coherence domains in matter interacting with radiation, **M Apostol**, Phys. Lett. **A373** 379 (2009)
2.3.2.16 Dynamics of collective density modes in multi-component molecular mixtures, **M Apostol**, Phys.&Chem. Liquids **47** 35 (2009)
2.3.2.17 Electric flow through an ideal ferromagnet-superconductor junction, O A Dobrescu, L C Cune and **M Apostol**, Physica **C469** 273 (2009)
2.3.2.18 Electromagnetic field interacting with a semi-infinite plasma, **M Aposto**l and G Vaman, J. Opt. Soc. Am. **A26** 1747 (2009)
2.3.2.19 Reflection and refraction of the electromagnetic field in a semi-infinite plasma, **M Apostol** and G Vaman, Optics. Commun. **282** 4329 (2009)
2.3.2.20 Reflected and refracted of the electromagnetic fielda in a semi-infinite body, **M Apostol** and G Vaman, Solid State Commun. **149** 1936 (2009)
2.3.2.21 Plasmons and polaritons in a semi-infinite plasma and a plasma slab, **M Apostol** and G Vaman, Physica **B404** 3775 (2009)
2.3.2.22 Plasmons and diffraction of an electromagnetic plane wave by a metallic sphere, **M Apostol** and G Vaman, Progr. Electrom. Res. (PIER) **98** 97 (2009)
2.3.2.23 Electromagnetic eigenmodes in matter. Van der Waals-London and Casimir forces, **M Apostol** and G Vaman, Progr. Electrom. Res. (PIERB) **B19** 115 (2010)
2.3.2.24 Pulsed thermoelectricity, **M Apostol** and M Nedelcu, J. Appl. Phys. **108** 023702 (2010)
2.3.2.25 Plasmons, polaritons and diffraction of the eletromagenic field for an infinite circular cylinder, **M Apostol** and G Vaman, Roum. J. Phys. **55** 493 (2010)
2.3.2.26 Atraction force between a polarizable point-like particle and a semi-infinite solid, **M Apostol** and G Vaman, Roum. J. Phys. **55** 764 (2010)
2.3.2.27 Coherent polarization driven by external electromagnetic fields, **M Apostol** and M Ganciu, Phys. Lett. **A374** 4848 (2010)
2.3.2.28 Polaritonic pulse and coherent X- and gamma rays from Compton (Thomson) backscattering, **M Apostol** and M Ganciu, J. Appl. Phys. **109** 013307 (2011)
2.3.2.20 Dynamics of electron-positron pairs in a vacuum polarized by an external, radiation field, **M Apostol**, J. Mod. Optics. **57** 611 (2011)

2.3.3. E-3: Nonlinear dynamical systems, integrability and applications Activity Report (2007-2011)

2.3.3.1. Introduction

The research in our team is foscused on nonlinear mathematical physics and applications. We are interested in the followingt main topics:

1. THEORY:

a) discrete and ultradiscrete nonlinear dynamical systems, singularity analysis using methods from algebraic geometry.

b) symmetries and integrability of continuous dynamical systems on curved spaces; methods from differential geometry and group theory .

c) study of homotopy algebras and applications to M-theory using theory of categories and algebraic geometry.

2. APPLICATIONS:

a) nonlinear dynamics of gene regulatory networks, cancer dynamics and virus dynamics.

b) deterministic and stochastic soliton dynamics in various models of fluids, plasmas and lattices.

2.3.3.2. The main theoretical results of the team

The main results obtained so far in the theoretical topics can be summarised as follows:

a) Deautonomisation and integrability of some nonlinear discrete systems (non-QRT type) using singularity confinement. We have got very important results about these type of systems and specially those obtained by reduction of nonlinear integrable partial discrete equations. [A1]
Then we obtained a simple from of the elliptic Painleve equation. This is the master equation of all discrete integrable systems and special functions.[A3]
Again in the topic of delay equations we were able to give the bilinear formulation of all the delay painleve equations known to date. This will allow construction of special solutions using determinants and we hope that this results will open a completely new topic of special functions described by delay equations (combining derivatives and finite shifts) [A7]
Another results is about classification of integrable mappings on rational elliptic surfaces . We have given a classification of two dimensional integrable mappings by studying the corresponding rational elliptic surfaces obtained by blowing-ups. The action of the mapping on the singular fibers of elliptic surfaces is extremely important. This classification provides a method to compute the invariants from the singularity structure of the two dimensional mapping obeying the singularity confinement criterion.

b) Here the main results are related to the algebraic structure of symmetries on various curved spaces. The role of Killing and Killing Yano tensors is crucial and it provides not only connection with Lax formalism (on which relies the whole theory of integrability) but also with presence of fermions on curved background. The main contributions are in [A14].

c) On this direction the first result describes extended gradings of open topological field theories in two dimensions in terms of skew categories, proving a result which alows one to translate between the formalism of graded open 2d TFTs and equivariant cyclic categories. As an application of this formalism, it is described the open 2d TFT of graded D-branes in Landau-Ginzburg models in terms of an equivariant cyclic structure on the triangulated category of 'graded matrix factorizations' introduced by Orlov. This leads to a specific conjecture for the Serre functor on the latter, which generalizes results known from the minimal and Calabi-Yau cases. It is also given a description of the open 2d TFT of such models which manifestly displays full grading induced by the vector-axial R-symmetry group.[A10]

Also it is studied extended Berezin and Berezin-Toeplitz quantization for compact Kahler manifolds, two related quantization procedures which provide a general framework for approaching the construction of fuzzy compact Kahler geometries. Using this framework, we showed that a particular version of generalized Berezin quantization, which we baptize "Berezin-Bergman quantization", reproduces recent proposals for the construction of fuzzy Kahler spaces. We also discussed how fuzzy laplacians can be defined in our general framework and study a few explicit examples. Finally, we used this approach to propose a general explicit definition of fuzzy scalar field theory on compact Kahler manifolds [A11]

2.3.3.3. The main results on the applications

The protein production for a gene regulatory network model with activation-repression links (cascade) is analysed In these networks this production depends on how proteins induce or repress the genes. Experiments show that networks of inducers or repressors exhibit bistability or oscillatory behaviour of protein production Here we report a completely novel aspect, namely for different promoter activity functions. protein production initially localised on a certain number of genes can propagate to the others in a "solitonic" way. In particular, the chemical rate equation for the cascade can be solved exactly and in the case of big number of operator sites the proteomic signal along the gene network is given by a superposition of perturbed dark solitons of defocusing semidiscrete modified Korteweg de Vries equation [C1,A2]

Another results is about modular network cascade with general activation/repression coupling. It is shown that in certain conditions (the Hill coefficient is unity) it is equivalent to a cascade made of the same type of gene, and moreover the dynamics is linearisable. The protein production is shown to be a travelling kink wave on the cascade showing a successive gene expression along it. Also a cellular automaton description for both open and closed (plasmid) cascades is provided. [A6]

The next result is related to a simple model for a vascularized non-necrotic tumor combining the ideas presented by Byrne and Chaplain several years ago. The steady state solution is found in the case of spherical symmetry and in the presence of an inhibitor. For an inhibitor free model the linear stability of the steady state is discussed and a general formula for the increment of the I-harmonic is obtained

The last important result is related to modulational instability (MI) in the class of NLS equations using a statistical approach (SAMI). A kinetic equation for the two-point correlation function is studied in a linear approximation, and an integral stability equation is found. The modulational instability is associated with a positive imaginary part of the frequency. The integral equation is solved for different types of initial distributions (delta-function, Lorentzian) and the results are compared with those obtained using a deterministic approach (DAMI). The differences between MI of the normal NLS equation and derivative NLS equations is emphasized.

Next Directions:

1. Algebraic geometric description of discrete Nahm equations (this will open a new direction on the algebraic geometry of integrable systems
2. Delay equations, isomonodromic deformations.
3. Ultradiscrete solitons and singularity analysis using tropical elliptic curves
4. Categorial approach to isomonodromic deformations. We intend to generalize the results of Joyce and Bridgeland related to stability conditions on abelian categories.

References:

[A1]. **A. S. Carstea**, A. Ramani, B. Grammaticos,Deautonomizing non-QRT mappings, Journal of Physics A: Math. Theor, 42, 485207, 2009

[A3]. B. Grammaticos, **A. S. Carstea**, A. Ramani, On the non-autonomouys form of the Q4 mapping and its relation with elliptic Painleve equation, J. Physics A: Math. 42,322003, 2009

[A7]. **A. S. Carstea**, Bilinear approach to delay-Painleve equations, Journal of Physics A: Math. Theor.44, 105202, 2011

[A14] B. Saha, **M. Visinescu**, String cosmological model in the presence of magnetic flux, Astrophysics and Space Science, 315, 99, 2008

[A10].**C. I. Lazaroiu**, Graded D-Branes and skew categories, Journal of High Energy Physics, 8, 088, 2007

[A11].**C. I. Lazaroiu**, D. McNamee, C. Saemann, Generalised Berezin quantisation, Bergmann metrics and fuzzy laplacians, , Journal of High Energy Physics, 9, 059, 2008

[A2]. **A. S. Carstea**, A. Ramani, K. M. Tamizhmani, B. Grammaticos, Proteomic signals in simple transcriptional cascades, Chaos Solitons Fractals, 41, 1823, 2009

[A6]. **A. S. Carstea, D. Grecu, A. T. Grecu**, Proteomic signals in modular transcriptional cascades; discrete time and cellular automata approach, Physica D, 239, 967, 2010

2.3.4. E-4: Binary Nuclear Systems. Synthesis and Decay) Activity Report (2007-2011)

2.3.4.1. Decay modes of superheavy nuclei

Calculations of half-lives of superheavy nuclei (SH) show [5.1] an unexpected result: for some of them heavy particle radioactivity (HPR) dominates over alpha decay --- the main decay mode of the majority of recently discovered SHs. The result is important for theory [5.2] and future experiments producing heavier SHs with a substantial amount of funding. The standard identification technique by alpha decay chains will be impossible for these cases. HPR [5.3] had been predicted in 1980 (see http://www.britannica.com/EBchecked/topic/465998/). All measured half-lives on ^{14}C, ^{20}O, ^{23}F, $^{22,24-26}Ne$, $^{28,30}Mg$, $^{32,34}Si$ radioactivities are in agreement with predicted values within our analytical superasymmetric fission model. Recently we changed the concept of HPR to allow emitted particles with atomic numbers $Z_e > 28$ from parents with $Z > 110$ and daughter around ^{208}Pb. Calculations for superheavy (SH) nuclei with Z=104-124 are showing a trend toward shorter half-lives and larger branching ratio relative to alpha decay for heavier SHs. New type of universal curve was developed [5.4] allowing to plot on the same line all kinds of HPR and alpha decay.

2.3.4.2. Two center and three center shell models

A formula describing the proton density dependence on macroscopic deformation energy for different fusion like shape configurations was derived. A smooth necking region between fission fragments was obtained [5.5] by rolling a sphere around the symmetry axis of the nuclear shape formed by two intersected spheroids. Also a microscopic potential was derived [5.6] in correlation with the necking region within the fission -like shape on the basis of potential theory. The whole microscopic potential is of the two-center type, yielding the evolution of proton and neutron level schemes from one parent to two completely separated fragment nuclei. Original aspects were elaborated by using potential theory and differential geometry leading to the adopted neck potential. Also a new concept is introduced by defining matching potential surfaces as regions of continuity in the multidimensional space of deformation. It was employed to study fusion channels producing SH nuclei. True ternary fission of superheavy nuclei was studied by developing a three-center shell model [5.7]. The three-center shell model is used to compute the transition toward three equal fragment partition. The levels are used to compute the shell corrections with the Strutinsky method. The liquid drop part is calculated using the Yukawa-plus-exponential model. The total deformation energy is then minimized over a multidimensional space of deformation. The dynamics is completed with the Werner–Wheeler tensor of inertia calculation, and cluster emission paths for binary and ternary splitting are obtained for Z=120 isotopes.

2.3.4.3. Atomic clusters deposited on a surface and fission of metallic clusters

The main idea of the program performed in cooperation with the Theoretical MesoBioNano Science Group at Frankfurt Institute for Advanced Studies, was to advance significantly the understanding of mechanisms of growth of atomic clusters deposited on planar surfaces, potentially applicable in nanotechnology, microelectronics or medicine. The electronic shell structure in monovalent free-electron metal clusters has shown a strong analogy with the single-particle states of atomic nuclei. The delocalized electrons of a metallic cluster may be considered to form a Fermi liquid like the atomic nucleus. Consequently several theories and computation techniques from nuclear physics could be adapted to atomic clusters.

By using scanning probe microscopy it is possible to observe the shapes of deposited clusters. The final shape of some of them may be approximated by a hemispheroid, giving us a motivation to develop a suitable shell model. The simplest shape we considered first was the hemispheroid, for which we calculated the deformation-dependent surface and curvature liquid drop model (LDM) energies [5.8]. We also studied the short and long spheroidal cap shapes. A new single-particle shell model of a three-dimensional harmonic oscillator with equipotential surfaces of the same shape was developed [5.9]. The energy levels of this model have been used as input data for shell and pairing corrections [5.10]. We have derived analytical relationships for the surface and curvature energies of oblate and prolate hemispheroidal atomic clusters and for the energy levels of the first version of the shell model as well. In the next steps we simulated better the experiments by considering more complex shapes, a term proportional to the square of angular momentum in the Hamiltonian, a variable surface tension, etc.

We obtained very interesting results concerning the stability of atomic cluster shapes deposited on a surface both in the liquid-drop model and after including the shell corrections. The single-particle shell model we developed is an original contribution to the quantum mechanics of new kinds of potential wells.

The neutron reach ^{264}Fm is an ideal cold fissioning nucleus leading to two identical doubly magic fragments ^{132}Sn. It poses a unique property having a deep minimum of shell correction energy at the same mass asymmetry h=0 with the minimum of the LDM deformation energy. On the other side, it was experimentally proven that the most important yield in fission of charged metallic atomic clusters is usually obtained when the light fragment is a singly charged trimer (the analog of an alpha particle with magic number of delocalized electrons n_e=2). Our calculations for the fission of $Ag^{2+}{}_{12}$, as well as for fission of various Cs clusters are showing that in this case both the shell corrections and the LDM deformation energy have minima at the same mass asymmetry which corresponds to the trimer emission. Charged metallic clusters are ideal emitters of singly ionized trimers because both LDM and shell correction are reaching a minimum for the same mass asymmetry corresponding to the emission of a charged particle with two delocalized electrons. Calculations of Q_2-values for Cs, Na, Au, and Cu atomic clusters multiply ionized (z=2, 4, 6, 8, 10) and spheroidally deformed prove that large dissociation energy is obtained for metallic clusters with high surface tension and low Wigner-Seitz radius (transition metals) [5.11].

The multidisciplinar character of our research comes both from the theoretical method which was previously used in nuclear physics, and from the possible applications in chemistry, nanotechnology, microelectronics, biophysics or medicine.

2.3.4.5. No-core shell model calculations and duble-beta decay mode

The first no-core shell model results for ^{48}Ca, ^{48}Sc and ^{48}Ti with derived and modified two-body Hamiltonians have been reported [5.12]. An oscillator basis with a limited range and a limited model space was used. It was found that the charge dependence of the bulk binding energy of eight A = 48 nuclei is reasonably well described with an effective Hamiltonian derived from the CD–Bonn interaction while there is an overall underbinding by about 0.4 MeV/nucleon. However, the resulting spectra exhibit deficiencies that are anticipated due to (1) basis space limitations and/or the absence of effective many-body interactions and (2) the absence of genuine three-nucleon interactions. Then an additive isospin-dependent central terms plus a tensor force was used to the Hamiltonian to achieve accurate binding energies and reasonable spectra for all three nuclei. The resulting no-core shell model opens a path for applications to the double-beta decay process [5.13,5.14].

In a next step the no-core shell model was applied to the nuclear structure of odd-mass nuclei straddling 48Ca [5.15]. Starting with the NN interaction, that fits two-body scattering and bound state data, the nuclear properties of A = 47 and A = 49 nuclei were evaluated while preserving all the underlying symmetries. Due to model space limitations and the absence of three-body interactions, phenomenological interaction terms were incorporated determined by fits to A = 48 nuclei. The modified Hamiltonian produces reasonable spectra for these odd-mass nuclei. In addition to the differences in single-particle basis states, the absence of a single-particle Hamiltonian in our no-core approach complicates comparisons with valence effective NN interactions. Purely off-diagonal two-body matrix elements were considered since they are not affected by ambiguities in the different roles for one-body potentials and we compare selected sets of fp-shell matrix elements of initial and modified Hamiltonians in the harmonic oscillator basis with those of a recent model fp-shell interaction, the GXPF1 interaction of Honma et al. While some significant differences emerge from these comparisons, there is an overall reasonably good correlation between the off-diagonal matrix elements and those of GXPF1.

References

5.1. Poenaru, D.N., Gherghescu, R.A., Greiner, Phys. Rev. Lett., **107** (2011) 062503.

5.2. Greiner, W., D.N. Poenaru, Neutron rich long-lived superheavies. Ch. 5 in M.Brenner, Ed., Cluster Structure of Atomic Nuclei, pp. 119-146. Research Signpost, Trivandrum, India, 2010.

5.3. Poenaru, D.N., Greiner, W., Cluster radioactivity, Ch. 1 in C.Beck, Ed., Clusters in Nuclei Vol. 1. Lecture Notes in Physics 818, pp. 1-56. Springer, Berlin, 2010.

5.4. Poenaru, D.N., Gherghescu, R.A., Greiner, W., Phys. Rev. C **83** (2011) 014601.

5.5. Gherghescu, R.A., Poenaru, D.N., Greiner, W., Phys. Rev. C **78** (2008) 024604.

5.6. Gherghescu, R.A., Poenaru, D.N., Carjan, N., Phys. Rev. C **77** (2008) 044607.

5.7. Gherghescu, R.A., N. Carjan, J. Phys. G: Nucl. Part. Phys. 36 (2009) 025106.

5.8. Poenaru, D.N., Gherghescu, R.A., Solov'yov, A.V., Greiner, W., EPL, **79** (2007) 63001; EPL **88** (2009) 23002

5.9. Poenaru, D.N., Gherghescu, R.A., Solov'yov, A.V., Greiner, W., Phys. Lett. A **372** (2008) 5448-5451.

5.10. Poenaru, D.N., Gherghescu, R.A., Plonski, I.H., Solov'yov, A.V., Greiner, W., Europ. Phys. J. D **47** (2008) 379-393. HIGHLIGHT PAPER

5.11. Poenaru, D.N., Gherghescu, R.A., Greiner, W., J. Phys. G: Nucl. Part. Phys. **37** (2010) 085101.

5.12. Vary, J.P., Popescu, S., Stoica, S., Navratil, P., J. Phys. G: Nucl. Part. Phys. **36** (2009) 085103.

5.13. Horoi, M., Stoica, S., Brown, B.A., Phys. Rev. C **75** (2007) 034302.

5.14. Horoi, M., Stoica, S., Phys. Rev. C **81** (2010) 024321.

5.15. Negoita, A.G., Vary, J.P., Stoica, S., J. Phys. G: Nucl. Part. Phys. **37** (2010) 055109.

2.3.5. E-5: [Nuclear Structure, double beta decay and atomic clusters] Activity Report (2007-2011)

2.3.5.1 Introduction

Nuclear structure development is reflected in the large number of proposed formalisms and the huge amount of accumulated data. In our group many interesting results concerning the collective properties in nuclei have been obtained over the last four years. The coherent state model proposed by the group leader in the beginning of 80's, has been substantially improved by adding the octupole degrees of freedom. The resulting formalism was further improved in order to describe the positive and negative parity bands in even-odd nuclei. We looked for signatures of static octupole deformation in even-even and chiral symmetry in odd-even nuclei.

2.3.5.2 Phase transitions in finite complex nuclei

The critical point of the transition SU(5)→SU(3) is described by the X(5) symmetry defined by the Schrödinger equation associated to the liquid drop Hamiltonian considered in the intrinsic frame, suplemented with an infinite square well for the β potential and an oscillator potential for the γ potential. Using a set of approximations for the rotational term, the differential equation is separable, each of the resulting equation being exactly solvable. Note that this model has two main drawbacks: i) the wave function in γ is not periodic and ii) the final Hamiltonian is not Hermitian with respect to the measure $|\sin 3\gamma| d\gamma$. Our group proposed a solution where the mentioned weak points are removed. The potential in β is replaced with sextic oscillator plus a centrifugal term, while the differential equation in γ is that of a spheroidal function. The results have been applied to several nuclei suspected to satisfy the criteria for a critical point of the phase transition mentioned above. Another transition considered is that from an oblate to a prolate shape with the critical point achieved in a triaxial shape. For this case the liquid drop Hamiltonian was expanded around $\gamma_0 = \pi/6$

and then some approximations were adopted in order that the two variables are decoupled. The resulting equation was supplemented with a sextic potential in β plus a centrifugal term. The equation in γ was reduced to the differential equation of the Mathieu function. The theory has been applied with positive results for six nuclei. Excitation energies in the ground, β and γ bands as well interband and intraband E2 transition probabilities have been calculated. Another phase transition which was recently investigated was that from a superfluid to a normal phase leading to the so called backbending phenomena. A set of deformed particles correlated by pairing interact with a deformed core. This Hamiltonian was diagonalized in an angular momentum projected basis from two product states: a deformed BCS state and a deformed quadrupole coherent state and 2qp deformed state and the mentioned deformed collective state. The yrast energies have been used to plot the moment of inertia versus the angular frequency squared. The experimental situation for

some isotones with N=90-94 has been nicely described. The phase transition is also reflected in the discontinuity in the behavior of the gyromagnetic factor.

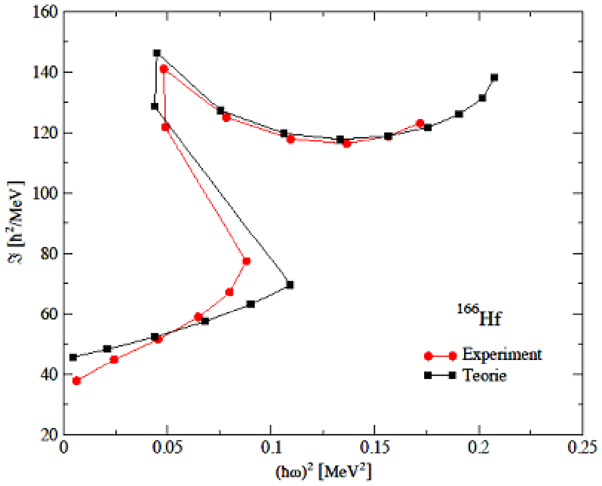


Fig. 1 For illustration we give the backbending of the moment of inertia for ^{166}Hf, obtained within our formalism.

2.3.5.3 New results obtained with the coherent state model

Recently, the CSM formalism has been used for describing the excitation energies in g, β and γ bands as well as the related BE(2) values in those nuclei which are suspected to exhibit the features of X(5) "symmetry" and triaxial nuclei. The agreement with the experimental data is very good. These results encouraged us to extend the CSM descriptions to other symmetries/nuclear phases and critical points. To make the task easier we obtained first compact formulas for energies and E2 transition probabilities for near vibrational and well deformed nuclei, respectively. These were successfully applied for 44 nuclei belonging to various symmetries. We obtained an overall good agreement with the available experimental data.

Another issue considered by our group was the extension of the CSM by adding the octupole degrees of freedom. Finally, the model is able to describe with a resonable small number of free parameters, eight rotational bands, four of positive and four of negative parity. Besides the E2 we also calculated the E3 and E1 transition probabilities. Calculating the first and second order energy displacement functions we searched for signatures for setling a static octupole deformation in the ground as well as in the excited bands, by depicting the zeros of the mentioned functions. It was found out that from a critical value of the total angular momentum the angle between the angular momenta carried by quadrupole and octupole bosons, respectively are orthogonal. Also studying the electric and magnetic properties of the dipole bands we concluded that the band 1^+ is of magnetic nature while for the 1^- band, the electric properties prevail over the magnetic ones. To a phenomenological core described by the extended CSM we added a set of particles which interact with the core by qQ and jJ interactions. For the even-odd system we described 6 rotational bands with $K^{\pi}=1/2^+,1/2^-,3/2^+,3/2^-,5/2^+,5/2^-$. The last bands seem to exhibit chiral symmetry, i.e. the angular momentum carried by the odd nucleon is perpendicular to the plane of the orthogonal angular momenta carried by the quadrupole and octupole bosons respectively.

Recently, by a semiclassical treatment of CSM we derived through the quatization of the classical equations of motion for the variables β and γ, the differential equations which are specific to SMA (sextic and Mathieu approach)

2.3.5.4 Nuclear multifragmentation

A method for identifying statistical equilibrium stages in dynamical multifragmentation path as provided by transport models, already successfuly tested for the reaction 129Xe+119Sn at 32 Mev/nucleon is applied here to a higher energy reaction, 129Xe+119Sn at 50 Mev/nucleon. The method evaluates the equilibrium from the point of view of the microcanonical multifragmentation model (MMM) and reactions are simulated by means of the stochastic mean field model (SMF). A unique solution, corresponding to the maximum population of the system phase space, was identified suggesting that a huge part of the available phase space is occupied even in the case of the 50MeV/nucleon reaction, in presence of a considerable amount of radial collective flow. The specific equilibrium time and volume are identified and differences between the two systems are discussed.

The results from ten statistical multifragmentation models have been compared with each other using selected experimental observables. Even though details in any single observable may differ, the general trends among models are similar. Thus these models and smilar ones are very good in providing important physics insight especially for general properties of the primary fragments and the multifragmentation process. Mean values and ratios of observables are also sensitive to individual differences in the models. In addition to multifragmentation models, we have compared results from five commonly used evaporation codes. The fluctuations in isotope yield ratios are found to be a good indicator to evaluate the sequential decay implementation in the code. The systems and the observables studied here can be used as benchmarks for the development of statistical multifragmentation models and evaporation codes.

2.3.5.5 New features of the 2nbb decay

A many body Hamiltonian involving the mean field for a projected spherical single particle basis, the pairing interactions for alike nucleons, a repulsive dipole-dipole proton-neutron interaction in the particle-hole (*ph*) channel and an attractive dipole-pairing interaction is treated by a gauge restored and fully renormalized proton-neutron quasiparticle random phase approximation (*GRFRpnQRPA*) formalism. The resulting wave functions and energies for the mother and the daughter nuclei are used to calculate the 2νββ decay rate and the process half life for the emitters: 48Ca, 7Ge, 82Se, 96Zr, 100Mo, 104Ru, 110Pd, 116Cd, 128,130Te, 148,150Nd, 154Sm, and 160Gd. Also the strengths distribution for the single β- and β+ transitions of the mother and daughter nuclei respectively, have been calculated. The log ft values for the single beta transitions of the intermediate odd-odd nuclei towards the mother and daughter nuclei respectively were evaluated. Results are compared with the available experimental data as well as with those provided by other theoretical methods. The Ikeda sum rule (*ISR*) is obeyed.

2.3.5.6 Collective properties of deformed atomic clusters.

Some properties of small and medium sodium clusters are described within the RPA approach using a projected spherical single particle basis. The oscillator strengths calculated with a Schiff-like dipole transition operator and folded with Lorentzian functions are used to calculate the photoabsorbtion cross section spectra. Agreement with the corresponding experimental data is very good for both the surface and volume plasmons. The results are further employed to establish the dependence of the plasmon frequency on the number of cluster components. Static electric polarizabilities of the clusters excited in an RPA dipole state are also calculated. Comparison of our results with the corresponding experimental data show an overall good agreement.

The energy weighted sum rule for an electric dipole transition operator of a Schiff type differs from the Thomas-Reiche-Kuhn sum rule by several corrective terms which depend on the number of system components, N . For illustration the formalsim was applied to the case of *Na* clusters. One concludes that the RPA results for Na clusters obey the modified TRK sum rule.

2.3.5.7 Semiclassical description of some boson Hamiltonians.

Using the time dependent variational principle of minimum action for a quadratic quadrupole boson Hamiltonian, classical equations of motion are found for two pairs of conjugate phase space variables. The third component of angular momentum corresponding to the intrinsic coordinates is a constant of motion. Quantizing the classical Hamiltonian in the reduced space one obtains a Scrödinger equation for the polar coordinate with the potential consisting of two terms, one armonic term and a centrifugal term. This is known in the literature as the Davidson potential. The potential depends also on the angular momentum of the system in the laboratory frame. The solution of the mentioned equations provides a very compact expression for energy as function of angular momentum which generalizes the Holmber-Lipas formula. This has been used for excitation energies in the ground state band with J going up to high and very high values (40+). Application for 44 nuclei belonging to different symmetries shows a very good agreement with the data.

The procedure has been extended to the fourth, sixth and eight order boson Hamiltonians which are exactly solvable.

2.3.6. E-6: Quantum Information and Nonlinear Mesoscopic Systems

Activity Report (2007-2011)

2.3.6.1. Introduction

The scientific objectives of the present team are connected with the understanding of the physical implications of the search of information carriers at the quantum level (opening the way toward the quantum computing), the understanding of efficient carrier vectors of the information transmission, and the development of specific tools for efficient and reliable processing of the digitized information occurring in the study of complex physical systems.

Quantum entanglement (inseparability or correlation) has been for the first time recognized by Einstein, Podolsky and Rosen, and by Schroedinger, as one of the most shocking characteristics of the quantum formalism, which after more than 70 years remains still fascinating, both theoretically and experimentally. In theory, inseparability producing nonclassical phenomena is typical for pure entangled (correlated) states. However, in laboratory, due to the uncontrollable interaction with the environment, there appear mixed states, rather than pure states. It is therefore very important to characterize the mixed states capable to produce quantum effects by their inseparability. Entanglement is considered a new fundamental physical resource in the theory of quantum information. It is crucial in the description, in a manner unknown to the classical physics, of the quantum information processing and transmission tasks, such as cryptography, teleportation, quantum computation, which will produce unpredictable changes in the present civilization. Understanding the way in which quantum information differs from the classical one implies the study of properties, implications and manipulation of the quantum entanglement and one of the most interesting aspects of the entangled states is that these states manifest correlations which do not have a classical analogue. By exploiting the uncertainty principle, entanglement and the inherent parallelism of quantum physics, physics of quantum information provides exciting capabilities for information processing and communication that cannot be achieved through non-quantum methods.

2.3.6.2 Quantum correlations in open systems

In the recent years there has been an increased interest to the study of Gaussian states of continuous variable systems used in quantum information processing and communication. Due to the decoherence phenomenon which takes place during the interaction of the system with its environment, the states describing the evolution of the system cannot preserve their purity and become mixed. The consistent description of the evolution of open systems was given in the framework of the theory based on completely positive quantum dynamical semigroups, which provides the only quantum theory satisfying all the fundamental properties of the density operator - positivity, trace preservation, hermiticity. We have described the time evolution of *quantum entanglement and quantum discord* for Gaussian states in open systems. The investigation of quantum correlations in open systems was done in order to clarify the role of the interaction between a system and its environment in the transmission of the information, in the context in which the quantum decoherence, determined by this interaction, leads to quantum information loss. We described the time evolution of quantum entanglement and quantum discord of two independent harmonic oscillators interacting with a common environment, characterized by diffusion and dissipation coefficients, and by temperature [7.1,7.2]. In certain circumstances, the environment enhances the entanglement and in others it suppresses it and the state describing the open system becomes separable. The structure of the environment may be such that not only the state of the open system become entangled, but also such that the entanglement is maintained for a definite time or a certain amount of entanglement survives in the asymptotic long-time regime.

2.3.6.3 Few-optical-cycle solitons

There have been performed numerous theoretical studies in the area of nonlinear optics and photonics: i) spatiotemporal effects in nonlinear optical media (spatiotemporal optical solitons in both conservative and dissipative physical settings), ii) vortex solitons in optics and in Bose-Einstein condensates, and iii) few-cycle optical solitons (including ultrashort light bullets) beyond the slowly varying envelope approximation [7.3,7.4]. These theoretical studies predicted the existence of stable three-dimensional spatiotemporal solitons and vortices supported by two-dimensional photonic lattices; it was found that the Hamiltonian-versus-soliton norm diagram exhibits a two-cusp structure and, correspondingly, a swallow-tail shape (a unique "swallow-tail" bifurcation), which is a rare physical phenomenon. This unique feature is a generic one: it has been also found in radially symmetric Bessel lattices, a result suggesting a promising approach to generate stable "light bullets" in optics and stable three-dimensional solitons in attractive Bose-Einstein condensates. The recent work was concentrated on the adequate description of *vector few-optical-cycle solitons* beyond the slowly varying envelope approximation, in order to exploit the vectorial nature of the electric field and to put forward unique polarization effects and the generic decay scenarios of unstable vector solitons. This work is currently performed in collaboration with scientists from France. Note that in recognition of his contributions in nonlinear optics and photonics, the International Commission for Optics (ICO) granted Prof. Dumitru Mihalache the 2009 Galileo Galilei Award "for his achievements in the field of theoretical nonlinear optics".

2.3.6.4 Nonlinear dynamics of Bose-Einstein condensates

It was investigated the formation of surface waves in parametrically driven *Bose-Einstein condensates*, by introducing: i) an accurate, effectively one-dimensional treatment of high-density cigar-shaped condensates and ii) a variational recipe that reduces the dynamics of the condensate (namely, the collective modes of the bulk and the emergence of the surface wave) to the level of a few ordinary differential equations [7.5].

2.3.6.5 Efficient processing of the digitized information

Typical illustrations are the investigations of the *two-band two-dimensional Hubbard model* of the high-temperature superconductivity in cuprates and the *Bayesian automatic adaptive quadrature*. The Hubbard model is spanned by an intricate Clifford algebra involving both fermionic (single particle) and bosonic (singlet) Hubbard operators. Significant steps have been made toward a model formulation yielding energy spectra overall consistent with the expected doping dependence of the various cuprate families. Rigorous mathematical solution of the generalized mean field approximation (GMFA) of the 4x4 Green function matrix of the model has been obtained [7.6]. The statistical correlations following from this solution show that the Anderson's conjecture concerning the spin-charge separation in cuprates is embedded in the model predictions. The cuprate symmetries were shown to damp out the potential energy correlations such that the exchange mechanism of the superconductivity in cuprates originates in the kinetic correlations of the singlet hopping conduction with the surrounding charge distribution. These four-particle charge-charge correlations have been rigorously proved to be equivalent to an effective Cooper pair correlation. Finally, the GMFA spectrum of the superconducting phase points to an overall spectrum displacement toward lower energies, in agreement with very precise optical measurements. The achieved progress opens the door to precise numerical evaluations and to adequate formulation of the Dyson equation of the model to unveil the kinematical correlations in the strong coupling limit.

2.3.6.6 Global analysis of bound and resonant states

The analytical properties of the S-matrix provide a comprehensive method for investigating the problem of *quantum scattering*. Due to their close connection to the bound and resonant states the distribution of the poles for various potentials as a function of potential strength was extensively investigated by choosing a particular path in the complex plane and calculating the corresponding trajectory of the S-matrix poles. A global method for all S-matrix poles analysis, named Riemann surface approach to bound and resonant states has been applied to various complex potentials. The Riemann surface approach to bound and resonant states has been generalized to the case of a two-channel model [7.7].

2.3.6.7 Numerical and analytical approximation methods

The central idea is to describe the behaviour of some realistic physical systems through realistic *numerical or analytical approximations*. This approach is justified by the fact that, in spite of their great conceptual interest, the exactly solvable models can describe only a small part of the physically interesting phenomena. In physics of low-dimensional systems, which present a special interest due to their ability to characterize heterojunctions, quantum wells, wires and dots, there is a large number of Monte Carlo simulations, but few analytic results. At the same time, some problems of nanophysics can be satisfactorily approached as simple quantum mechanical problems, whose solving requires however a high precision. A large number of interesting results have been obtained in quantum mechanics, for instance the exact solution of the Schroedinger equations for coupled channels, the efficient evaluation of the Airy propagator, the analytic approximation of the quartic oscillator in external field. In problems of statistical mechanics or many-body physics, analytical results for thermal phase transitions in 2D systems and quantum phase transitions in 1D systems have been obtained [7.8,7.9]. Prof. Liviu Ixaru, a pioneer of research in computational physics in Romania, is the winner of the prestigious High Performance Computing Prize (2006).

2.3.6.8 References

7.1 A. Isar, Phys. Scripta **82**, 038116 (2010)
7.2 A. Isar, Open Syst. Inf. Dynamics 18, 175 (2011)
7.3 H. Leblond, D. Mihalache, Phys. Rev. A **79**, 063835 (2009)
7.4 H. Leblond, H. Triki, F. Sanchez, D. Mihalache, Phys. Rev. A 83, 063802 (2011)
7.5 A.I. Nicolin, Phys. Rev. E (2011) (accepted for publication)
7.6 Gh. Adam, S. Adam, J. Phys. A: Math. Theor. 40, 11205 (2007)
7.7 C. Grama, N. Grama, I. Zamfirescu, J. Math. Phys. 51, 122106 (2010)
7.8 V. Barsan, Philos.Mag. 91, 477 (2011)
7.9 R. D’Ambrosio, L. Gr. Ixaru, B. Paternoster, Comput. Phys. Commun. 182, 322 (2011)

2.3.7. E-7: Structure and Dynamics of Nuclei and Neutron Stars: Activity Report (2007-2011)

2.3.7.1. Introduction

The research of our group is focused on the developing of theoretical models aimed to describe the properties of atomic nuclei and neutron stars. It includes nuclear structure studies as well as dynamics of collective mode and heavy ions collisions in a wide range of energies. The research topics and our most recent contributions to the field are listed below.

2.3.7.2. Pairing correlations in nuclei.

The most known pairing phenomenon is the superconductivity of electrons in metals, described by the BCS theory. Compared to electronic systems, nuclear systems present special features because they involve two kinds of fermions, neutrons and protons. Therefore in nuclear systems one can have not only Cooper pairs of like fermions, such as neutron-neutron and proton-proton pairs , but also two types of proton-neutron pairs, i.e., isovector (isospin T=1) and isoscalar (isospin T=0) pairs. One of the most debated topic in nuclear physics, stimulated by the recent advances in the radioactive beams facilities, it is the competition between the isoscalar and isovector proton-neutron superfludity in nuclei . Thus, fingerprints of isoscalar proton-neutron superfluidity are currently investigated in the ground state of self-conjugate (N=Z) nuclei and in the response of nuclei to the rotation. On theoretical side, the most common formalism to treat the competition between T=1 and T=0 pairing is the generalized HFB approach. The drawback of HFB is that it does not conserve exactly the particle number and the total isospin of the nucleus. Related to these issues we have performed the following studies: a) We have analyzed the performance of particle number restoration BCS (PBCS) approximations in exactly solvable models [8.4,8.5]. We have shown that the PBC approximations , when applied in a limited window of the Fermi level, are very accurate for the pairing among like-particles but not for the proton-neutron pairing ; b) We have made a systematic study of the competition between the isovector and isoscalar pairing based on a simplified shell model Hamiltonian, which includes T=1 and T=0 pairing as well as the quadrupole degrees of freedom, and we have shown that the isoscalar pairing has a small influence on the excitation spectra of pf-shell nuclei [8.1]; c) We have shown that the isovector pairing interaction can be accurately described by a condensate of alpha-type quartets formed by two neutrons and two protons coupled to the total isospin T=0 and total spin S=0 [8.10]. In addition, in the last years we have also studied the spatial localization of pairing correlations in nuclei [8.3,8.7]. Through these studies we have shown that in nuclei the pairing coherence length is much smaller than it was generally believed.

2.3.7.3. Density matrix renormalization group (DMRG) applied to nuclear structure.

The majority of DMRG calculations in nuclear structure have been done in the m-scheme, which breaks the rotation symmetry. Our contribution was to develop a DMRG calculation scheme in which the rotation symmetry is exactly preserved. We have shown that the DMRG is able to give accurate description of nuclear properties in small spaces compared to shell model calculations [8.6].

2.3.7.4. Neutron Stars Studies.

Our contribution to this field consist in a microscopic *calculation* of superfluid and thermal properties of the inner crust baryonic matter of neutron stars. Thus, we have studied the influence of pairing on the structure [8.9] and on the thermalisation process of the inner crust [8.2, 8.8]. We have shown that the crust thermalisation time, in the case of a fast cooling scenario, depends significantly on the intensity of pairing correlations [8.2].

2.3.7.5. Nuclear dynamics from Coulomb to ultra-relativistic energies

1. *Fusion dynamics, excitation of collective modes during the pre-equilibrium stage of heavy ions collisions at low and intermediate energies within microscopic transport models.* Based on microscopic transport models fusion dynamics and giant dipole modes were investigated in a self-consistent manner. The research stimulated experimental investigations that validated some of the predictions. As a result, we were invited in international collaborations to substantiate theoretically the experimental findings, see Refs. [8.12],[8.14],[8.16], [8.17],[8.24].

2. The dynamics of nuclear multifragmentation, the kinetics of phase transition and the role of instabilities in asymmetric nuclear matter. We described for the first time within microscopic transport models, both analytically and numerically, the spinodal decomposition mechanism in binary systems as asymmetric nuclear matter. The model was applied to characterize nuclear multifragmentation at Fermi energies, see ref. [8.19].

3. New fragmentation modes in semi-peripheral collisions at Fermi energies. Was described the neck fragmentation mechanism within Stochastic Mean-Field Model. The predictions stimulated experimental investigations within CHIMERA collaborations in which we were involved on the theoretical side. The results have been published in Physical Review C, Nuclear Physics A, Int. Jour. of Modern Phys. E, see Refs. [8.12],[8.20].

4. The role of the symmetry energy and isospin dynamics in reactions with exotic nuclei. Various mechanisms and processes were studied in connection with the symmetry energy dependence both in non-relativistic and relativistic regimes (Refs. [8.15] and [8.21], a topical review)

5. The role of chiral symmetry breaking on Quark-Gluon Plasma (QGP) collective properties. Within a relativistic microscopic transport approach we studied the collective features of the expanding QGP in realistic conditions associated with RHIC experiments. Results were published recently in Physics Letters B and Journal of Physics: Conference series see the Refs. [8.18] and [8.23]. The phase diagram including the QGP phase transition was studied within various models in papers published in Physical Review C, Progress in Particle and Nuclear Physics, see Refs. [8.15],[8.21],[8.22].

References

2.3.8.1 Y. Lei, S. Pittel, **N. Sandulescu**, A. Poves, B. Thakur, and Y. M. Zhao, Phys. Rev. C 84, 044318 (2011).

2.3.8.2 M. Fortin, F. Grill, J. Margueron, Dany Page, and **N. Sandulescu**, Phys. Rev. C 82, 065804 N.

2.3.8.3 Pillet, **N. Sandulescu**, P. Schuck, and J.-F. Berger (2010), Phys. Rev. C 81, 034307 (2010).

2.3.8.4 **N. Sandulescu**, B. Errea, and J. Dukelsky, Phys. Rev. C 80, 044335 (2009).

2.3.8.5 **N. Sandulescu** and G. F. Bertsch, Phys. Rev. C 78, 064318 (2008).

2.3.8.6 B. Thakur, S. Pittel, and **N. Sandulescu**, Phys. Rev. C 78, 041303 (2008).

2.3.8.7 N. Pillet, **N. Sandulescu**, and P. Schuck, Phys. Rev. C 76, 024310 (2007).

2.3.8.8 C. Monrozeau, J. Margueron, and **N. Sandulescu**, Phys. Rev. C 75, 065807 (2007).

2.3.8.9 F. Grill, J. Margueron, **N. Sandulescu**, Phys. Rev. C, accepted.

2.3.8.10 **N. Sandulescu**, J. Dukelsky, D. Negrea, J.Phys.Conf.Ser.321:012001,2011

2.3.8.11 J. Rizzo, M. Colonna, **V. Baran**, et.al., **Nucl. Phys. A** 806, 79-104 (2008).

2.3.8.12 B. Martin, D. Pierrousakou,C. Agodi,.**V. Baran** et al., **Phys. Lett. B** 664, 47-51 (2008).

2.3.8.13 M. Colonna, **V. Baran,** M. Di Toro, H. H. Wolter **Phys. Review C** 78, 064618 (2008).

2.3.8.14 **V. Baran**, C. Rizzo, M. Colonna, et. al., **Physical Review C** 79, 021603 (2009).

2.3.8.15 M. Di Toro, **V. Baran**, et al., **Prog. in Part. and Nucl. Phys.** 62, *389-401 (2009).*

2.3.8.16 D. Pierroutsakou, B. Martin,...,**V. Baran** et al., **Physical Review C** 80, 024612 (2009).

2.3.8.17 A. Corsi, O. Wieland,…, **V. Baran, Physics Letters B** 679, 197-202 (2009).

2.3.8.18 S. Plumari, **V. Baran,** M. Di Toro, G. et.al, **Phys. Lett. B** 689, 18-22 (2010).

2.3.8.19 M. Colonna, **V. Baran,** M. Di Toro, V. Giordano, **Nucl. Phys. A** 834, 527-530 (2010).
2.3.8.20 P. Russotto,...,**V. Baran** et al., (Chimera Inter. Coll.), **Phys.Rev. C** 81, 064605 (2010).
2.3.8.21 M. Di Toro, **V. Baran,** M. Colonna, V. Greco, **Journal of Physics G: Nuclear and Particle Physics** 37, 083101 (2010), *Topical Review.*
2.3.8.22 M. Di Toro, Liu Bo, V. Greco, **V. Baran,** M. Colonna, S. Plumari, **Physical Review C** 83, 014911 (2011).
2.3.8.23 S. Plumari, **V. Baran**, M. Di Toro, V. Greco, **Journal of Physics: Conference Series** 270, 012061 (2011).
2.3.8.24 C. Rizzo, **V. Baran**, M. Colonna, A. Corsi, et al. **Phys. Review C** 83, 014604 (2011).

2.3.8. E-8: High Energy and Mathematical Physics
Activity Report (2007-2011)

2.3.8.1. Introduction

The start of LHC represents a milestone in the recent history of High Energy Physics. With the data collected within only a couple of years it will be possible to confirm or refute the existence of the Higgs bosson, the only missing piece of the Standard Model (SM) of Particle Physics. With more data collected, further precision tests of the SM are envisaged and also signs of new physics are expected to appear. Other experiments (for example dark matter or neutrino experiments) are expected to collect data which will have a direct impact on the SM or on the models of physics beyond the standard model (BSM). Therefore the field of High Energy Physics will experience very dynamic developments in the next period and in this context, theoretical high energy physics is expected to play a key role. The High Energy and Mathematical Physics group at IFIN-HH has expertise and will focus in the following research directions

1. Standard Model Physics (perturbative and nonperturbative methods, precision predictions)
2. Physics Beyond the Sandard Model and String Theory (phenomenology, model building, extra dimensions, non-perturbative effects in string theory)
3. Mathematical Physics (geometric and combinatorial methods in quantum mechanics, field theory and quantum gravity)

2.3.8.2. Standard Model Physics

The Standard Model of Particle Physics was tested with high accuracy. Now, in the LHC era, even better precision is needed in order to have correct interpretations of the data provided by the experiments. Our group focuses on precision tests of the SM as well as flavour physics.

One direction of research concerns the investigation of low-energy properties of the SM, in particular of its Goldstone bosons, the pi mesons, using Chiral Perturbation Theory, dispersive methods and numerical simulations on lattice. The study performed in [9.1] reveals the pitfalls of the analytic continuation of the pion-pion amplitude, in connection with the precise determination of the mass and width of the lowest resonance of QCD, the σ meson. In the framework of perturbative QCD, a set of new expansion functions were defined and the formalism was applied to the Adler function in massless QCD, allowing a precise determination of the strong coupling from the hadronic decays of the τ lepton [9.2]. We also worked on improving the knowledge of the electromagnetic and weak form factors of special interest in flavour physics [9.3,9.4]. Using perturbative and nonperturbative QCD, stringent model independent constraints were derived for the shape of the semileptonic form factors, allowing in particular a precise determination of the element V_{ub} of the CKM matrix [9.3]. Among the future interests of the group we mention studies in perturbative QCD, accurate determination of the CKM matrix elements and of other flavour physics parameters, and the transition between the soft and the hard regimes of QCD.

2.3.8.3. Physics Beyond the Standard Model and String Theory

Although the Standard Model of particle physics has so far been extremely successful, it is agreed that it leaves too many open questions to be considered an "ultimate theory". For this reason, the study of models of physics beyond the SM is of great interest. Such models, like non-commutative field theory, supersymmetry, large extra dimensions or string models, can provide a better understanding of the fundamental theory.

A possible fundamental extension of the SM is to consider that in the regime of short distance physics, the space time becomes non-commutative. The first implementation of this idea was quantum field theory (QFT) on the noncommutative Moyal space. This implies, on a combinatorial level, building QFT with ribbon graphs and is in direct relation with matrix models and thus with two-dimensional quantum gravity. Renormalizability of these QFTs is higly non-trivial, because of the appearance of a new type of divergence with respect to commutative QFTs, the (in)famous UV-IR mixing. An important result in the field was obtained in [9.5], where a scalar model with a modified propagator on the Moyal space was proposed and proved renormalizable at any order in perturbation theory. A future research direction is represented by the generalization of these matrix models to the three- and four-dimensional case - random tensor models.

We also studied effective Lagrangians for noncommutative mechanics, depending also on accelerations, which result from integrating over the momentum in the Feynman path integral [9.6]. Classical and quantum noncommutative mechanics, in the case of nonconstant symplectic form and the phase space collapse was also investigated. In [9.7] we analysed field theories on noncommutative spaces and the discretization induced in some cases by the representation of position operators, wave propagation and finiteness of the classical theory. We also studied causality in classical and quantum noncommutative field theories, which is a controversial issue due to the nonlocality of such theories [9.7].

Supersymmetry provides a solution to the hierarchy problem and a popular extension of the SM. In [9.8] we tested the idea of supersymmetry as a solution of the hierarchy problem in the minimal supersymmetric standard model (MSSM) by evaluating the electroweak scale fine tuning, at two-loop level. The possible signals for supersymmetry that favour low fine-tuning were identified in the context of the LHC first run. We showed that minimal fine-tuning and dark matter consistency predicts a Higgs mass near the LEPII bound. A particular problem of the SM and the MSSM is the Higgs sector and the mass of the lightest Higgs boson. The implications of physics beyond the SM or the MSSM on the Higgs sector were studied in detail in [9.9], using an effective operators approach. Operators of dimensions d=5 and d=6 were considered and their implications for phenomenology were investigated. Finally, a consequence of supersymmetry breaking is the presence of goldstino and its superpartner sgoldstino. In [9.10] we studied in detail the couplings of the goldstino superfield to the MSSM fields, together with the implications for phenomenology.

In the context of string phenomenology one problem is the issue of moduli stabilisaton. An important result in this direction was the possibility to obtain fully stabilised Minkowski vacua in type II string compactifications on manifolds with SU(3) structure [9.11]. New fluxes, which are important for moduli stabilisation, often make their presence via string dualities. In [9.12], new features in the heterotic – type IIA dualities with fluxes were discovered and it turned out that for certain types of fluxes one needed to go to M-theory, or even F-theory, rather than type IIA, in order to find the dual setup. Another rather important aspect in string phenomenology is understanding non-perturbative effects in D-brane models. Euclidean branes can generate new couplings (Majorana masses for neutrinos, μ terms, new superpotential terms, terms which break supersymmetry, fermion masses) which are perturbatively forbidden. We studied stringy instantons which generate corrections to the superpotential [9.13] and explicit models with nonperturbative linear or mass terms [9.14]. In future our group will continue to focus on string phenomenology, M and F theory models, as well as cosmology in string inspired models.

2.3.8.4. Mathematical Physics

Mathematical physics is of central importance in theoretical physics due to its role of laying on rigorous mathematical basis various developments in physics. In connection with the very dynamical field of high energy physics, the significance of mathematical physics is much increased.

One interest of our group was the study of coherent states and the Jacobi group. We defined coherent states related to the Jacobi group based on the associated homogeneous spaces, Siegel-Jacobi domains. Among the most important results we mention: the realisation of the Jacobi algebra on differential opperators defined on Siegel-Jacobi domains; the determination of the Kähler two-form on the Siegel-Jacobi disc and on the upper half-plane Siegel-Jacobi. We determined the space of holomorphic functions on which the scalar product is defined; we studied the basis of functions on which the reproducing kernel is expanded; we studied squeezed states using the Jacobi group [9.15]; we constructed the discrete holomorphic series for the Jacobi group and the representations on coherent states based on Jacobi-Siegel domains. These representations admit explicit bosonic realizations for nuclear models of Bohr-Mottelson type.

An important aspect when looking for new theories is to find consistent couplings at quantum level. In [9.16] we have investigated the consistent interactions between tensor fields and gravity and found that there can be such couplins for tensors with mixed symmetry (2,2) and (3,1).

Recently our group also focused on a new approach - based on the Epstein–Glaser causal formalism - to perturbative quantum field theory. We showed in this way that minimal supersymmetry leads to anomalies [9.17] and proved that massive gravity can be consistently quantised using cohomological methods. However in the classical limit the resulting theory differs from general relativity [9.18]. In [9.19], a rigorous approach to some aspects of the theory of quantum strings was formulated. In future, we will continue the study of Yang-Mills theories and quantum gravity in the causal approach at higher orders of perturbation theory.

References

2.3.9.1 I. Caprini, Phys.Rev. D **77** (2008) 114019 .

2.3.9.2 I. Caprini, J. Fischer, Phys.Rev. D **84** (2011) 054019 .

2.3.9.3 C. Bourrely, I. Caprini, L. Lellouch, Phys. Rev. D **79**, (2009) 013008 .

2.3.9.4 B. Ananthanarayan, I. Caprini, I.Sentitemsu Imsong, Phys. Rev. D**83** (2011) 096002.

2.3.9.5 R. Gurau, J. Magnen, V. Rivasseau, A. Tanasa, Commun. Math. Phys. **287** (2009) 275.

2.3.9.6 C. S. Acatrinei, J.Phys.A40:F929,2007; J.Math.Phys.**49** (2008) 022903.

2.3.9.7 C. S. Acatrinei, J.Phys.A41:215401,2008; Rom.J.Phys.**53** (2008) 1007.

2.3.9.8 S. Cassel, D.M. Ghilencea, S. Kraml, A. Lessa, G.G. Ross. JHEP **1105** (2011) 120; S.Cassel, D. M. Ghilencea, G. G. Ross, Nucl. Phys. B **835** (2010) 110; Phys. Lett. B **687** (2010) 214.

2.3.9.9 I. Antoniadis, E. Dudas, D. M. Ghilencea, P. Tziveloglou, Nucl.Phys. B**848** (2011) 1; Nucl. Phys B **831** (2010) 133.

2.3.9.10 I. Antoniadis, E. Dudas, D. M. Ghilencea, P. Tziveloglou. Nucl. Phys. B **841** (2010) 157.

2.3.9.11 A. Micu, E. Palti, G. Tasinato, JHEP **0703** (2007) 104.

2.3.9.12 O. Aharony, M. Berkooz, J. Louis, A. Micu, JHEP **0809** (2008) 108; A. Micu, JHEP **1010** (2010) 059.

2.3.9.13 C. Angelantonj, C. Condeescu, E. Dudas, M. Lennek, Nucl. Phys. B**818**, 52-94 (2009).

2.3.9.14 P. G. Camara, C. Condeescu, E. Dudas, M. Lennek, JHEP **1006** (2010) 062.

2.3.9.15 S.Berceanu, A. Gheorghe, Rom. J. Phys. **56** (2011) 1056; Int. J. Geom. Meth. Mod. Phys. **v8** (2011) N8; Romanian J. Phys. **53** (2008) 1013.

2.3.9.10 C. Bizdadea, E. M. Cioroianu, S. O. Saliu, E. M. Babalic, Fortschr. Phys. **58**, No. 4 - 5, 341, 2010; Int. J. Mod. Phys. A**25** 1211, 2010

2.3.9.17 D. R. Grigore, G. Scharf, Annalen der Physik (Berlin) **17** (2008) 864.

2.3.9.18 D. R. Grigore, G. Scharf, Class. Quant. Gravity **25** (2008) 225008; D. R. Grigore, Class. Quant. Gravity **27** (2010) 015013.

2.3.9.19 D. R. Grigore, Rev. Math. Phys. **19** (2007) 749.

2.3.9. E-9: [Theoretical, computational and experimental methods in the analysis of exotic and rare nuclei] Activity Report (2007-2011)

2.3.9.1. Introduction

The last twenty years witnessed an increasing effort in understanding the nuclear dynamics under extreme conditions. Both theoreticians and experimentalists focused on the investigation of light exotic or superheavy nuclei produced in laboratories, or the highly exotic nuclear matter present in the interior of neutron stars and the explosive stage of supernovae. From theoretical point of view the accomplishment of such an ambitious task requires the improvement of the nuclear structure and reactions models, previously designed to describe stable nuclei. The nuclear structure models, such as the shell model required modifications in order to deal with nuclei possessing spatially extended neutron/proton halos or have so many protons (superheavies) that the traditional magic numbers are substantially changed. On the reaction model side there is a strong demand for new optical potentials to be used for generating distorted waves in the DWBA description of peripheral transfer reactions. They are necessary over a very wide range of projectile and target masses, and there are many compilations in the literature providing the real and imaginary components of the potential for some light projectiles (e.g. alpha) and heavier target (with A > 40). The hindrance to fusion at low energy phenomenon, discovered a decade ago, is also pointing to a modification of the traditional optical potential mainly in the interior of the Coulomb barrier. The putative existence of exotic nuclear matter in stellar environment prompted many theoreticians to take a fresh look to the properties of finite and infinite systems of alpha or heavier clusters in a neutron rich environment. In view of the complexity of such a many-body problem, new models should be designed or even just borrowed and adapted from other fields such as condensed matter physics. The experimental signatures of clustering and "fine structure" far from stability are supported by data from selective excitation in nucleon and α-transfer reactions, α-decay, heavy cluster decay, and by rotationally spaced energy levels, enhanced transition strengths and intensities, and appreciable emission width for the resonant states above the decay threshold. Last but not the least the theoretical and experimental developments mentioned above require a tremendous amount of computational effort.

2.3.9.2. Experimental analysis and theoretical interpretation of nuclear reactions involving exotic nuclei (F. Carstoiu and L. Trache)

The ground state of the proton-rich nucleus ^{23}Al has been studied by one-proton removal on a carbon target the EXOGAM + SPEG experimental setup at GANIL[10.1]. We confirm the ground state spin and parity of ^{23}Al as $J^{\pi}=5/2^{+}$. The production of ^{22}Na in ONe novae can be influenced by the ^{22}Mg(p,γ)23Al reaction[10.2]. To investigate this reaction rate at stellar energies, we have determined the asymptotic normalization coefficient (ANC) for ^{22}Mg+$p\rightarrow^{23}$Al through measurements of the ANCs in the mirror nuclear system ^{22}Ne+$n\rightarrow^{23}$Ne. Optical model parameters for use in the DWBA calculations were obtained from measurements of the elastic scatterings ^{22}Ne+^{13}C and ^{22}Ne+^{12}C. The cross section of the radiative proton capture reaction on the drip line nucleus ^{12}N was investigated using the asymptotic normalization coefficient (ANC) method [10.3]. We have used the ^{14}N(^{12}N,^{13}O)^{13}C proton transfer reaction to extract the ANC for ^{13}O→^{12}N+p and calculate from it the direct component of the astrophysical S factor of the ^{12}N(p,γ)^{13}O reaction. The ^{12}N(p,γ)^{13}O reaction was investigated in relation to the evolution of hydrogen-rich massive Population III stars, for the role that it may play in the hot *pp*-chain nuclear burning processes.

2.3.9.3. Fusion Reactions at extremely low energies (S. Misicu and F. Carstoiu)

In 2007, in collaboration with H. Esbensen from Argonne National Lab., S. Misicu extended a study that explained the steep falloff in the fusion cross section at energies far below the Coulomb barrier for the symmetric dinuclear system ^{64}Ni+^{64}Ni to another symmetric system, ^{58}Ni+^{58}Ni, and the asymmetric system ^{64}Ni+^{100}Mo[10.4]. Within the coupled-channels method, including couplings to the low-lying $2^+$and 3^- states in both target and projectile as well as mutual and two-phonon excitations of these states, we calculated and compared with the experimental data the fusion cross sections, *S* factors, and logarithmic derivatives for the above-mentioned systems and found good agreement with the data even at the lowest energies. Next, we analyzed the fusion data for ^{16}O+^{208}Pb [10.5]. Recent fusion reaction data for the systems ^{36}S + ^{48}Ca, ^{48}Ca + ^{48}Ca, and ^{96}Zr + ^{48}Ca were analyzed by us in [10.6]. We also analyzed the astrophysical relevant reactions ^{12}C+ ^{12}C, ^{12}C+ ^{16}O, ^{16}O+ ^{16}O [10.7]

2.3.9.4. Exotic Nuclear Matter in stellar environment (S. Misicu, F. Carstoiu, M. Rizea)

The ground state energy of ideal α-matter at T=0 was analyzed within the framework of variational theory of Bose quantum liquids [10.8,10.9]. The energy per particle of α matter was evaluated in the cluster expansion formalism up to four-body diagrams, and using the HNC/0 and HNC/4 approximation for a Bose liquid. Double folding alpha-alpha potentials were constrained to reproduce the l=0 resonance in ^{8}Be.We showed that under such assumptions we achieve a rapid convergence in the cluster expansion, the four-body contributions to the energy being smaller than the two-body and three-body contributions by at least an order of magnitude. In [10.10] we focused on the continuum-mechanical treatment of the oscillatory behavior of a viscoelastic solid globe. The efficiency of this method has been demonstrated for astrophysical models like degenerate compact stars (dwarfs, pulsars).

2.3.9.5. Numerical methods in nuclear reactions (M. Rizea, F. Carstoiu, I. Silisteanu, S. Misicu)

An important issue investigated by our team concerns the possibilities to increase the accuracy of the numerical solution of the one-dimensional TDSE [10.11]. In particular, a higher order Crank–Nicolson method based on an exponential fitting Numerov formula and transparent boundary conditions have been developed. In [10.12] we considered bi-dimensional axially symmetric nuclear shapes, allowing the treatment of both spherical and deformed nuclei. The solution of TDSE in two spatial dimensions was obtained by a grid-based method, using a discretization of the Hamiltonian by special finite difference approximations of the derivatives. The main computational challenges were the solution of algebraic eigenvalue problems and of linear systems with large sparse matrices, for which we have employed appropriate procedures. We also proposed an accurate computation of the eigensolutions of systems of coupled channel Schrodinger equations as they appear in studies of real physical phenomena [10.13]. We used a specific technique to compute the solution near the singularity in the origin, while on the rest of the interval the solution was propagated using a piecewise perturbation method. Such a method allowed us to take large steps even for high energy-values. The eigenvalues are determined by a shooting technique.

2.3.9.6. Neutron emission in scission and proton decay (M. Rizea and N. Carjan**)**

The investigation of scission neutrons plays an important role both for the fundamental understanding of the last fission stage and for various applications. The shape, structure and dynamics of fissile nuclei at scission are essential in determining many fission properties: the total kinetic energy of the fission fragments, their masses and their excitation energies, the rate of emission of ternary particles (like scission nucleons and alpha particles) etc. In ref. [10.14-10.15] we were concerned to assess the influence of the change of the nuclear shape on the nucleonic motion. We evaluated numerically physical quantities, like the number of emitted neutrons per scission event and the primary fragments' excitation energy. For proton emission, the most important calculable quantities are: the tunneling probability and the decay rate. We revealed the influence of the deformation on the decay rate [10.16].

2.3.9.7. Structure and decay of superheavy nuclei (I. Silisteanu and A. I. Budaca**)**

The systematics of decay half-lives of super heavy nuclei with Z=102-120 and N=150-180 vs decay energy or number of valence nucleons was investigated in several approximation schemes in ref. [10.17]. Half-lives given by self-consistent models for the clustering and resonance scattering are compared with empirical estimates. The very small widths of resonances observed experimentally in fusion-evaporation reactions, are interpreted as resonance levels of radioactive products, and such a correlation contributes directly to the study of the nuclear structure on the basis of decay data. From the ratio between experimental and theoretical results we can obtain preformation factors.

2.3.9.8. Exotic Modes of Neutron-rich nuclei (S. Misicu**)**

Within the nuclear core-layer model, the macroscopic excitation mechanism of the electric pygmy dipole resonance (PDR) was considered [10.18].The estimates for the PDR energy centroid and the total excitation probability throughout the nuclear chart are in good agreement to the data.

References

2.3.10.1. Banu A., **Trache L**., **Carstoiu F**. et al., Phys. Rev. C **84** (2011) 015803.
2.3.10.2. Al-Abdullah T., **Carstoiu F**., Chen X., ..., **Trache L**. et al., Phys.Rev. C **81** (2010) 035802.
2.3.10.3. Banu A., ..., **Carstoiu F**, ..., **Trache L.** et al., Phys. Rev. C **79** (2009) 025805.
2.3.10.4. **Misicu S**., and Esbensen H., Phys. Rev. C **75** (2007) 034606.
2.3.10.5. Esbensen H. and **Misicu S.**, Phys. Rev. C **76** (2007) 054609.
2.3.10.6. **Misicu S**. and **Carstoiu F.**, Phys. Rev. C **83** (2011) 054622.
2.3.10.7. **Misicu S**., and **Carstoiu F**., Nucl. Phys. A **834** (2010) 180C.
2.3.10.8. **Carstoiu F.** and **Misicu S.**, Phys. Lett. B **682** (2009) 33.
2.3.10.9. **Carstoiu F**., **Misicu S**., **Rizea M**. and Lassaut M., Int. J. Mod. Phys. E **20** (2011) 885.
2.3.10.10. Bastrukov S., Chang H., **Misicu S.** et al., Int. J. Mod. Phys A **22** (2007) 326.
2.3.10.11. **Rizea M**., J. of Math. Chem., **48** (2010) 55.
2.3.10.12. **Rizea M**., **Carjan N**., Comm. Comp. Phys **9** (2011) 917.
2.3.10.13. Ledoux L., **Rizea M**., …, and **Silisteanu I**., J. of Comp. and App. Math. **228** (2009) 197.
2.3.10.14. **Rizea M**., ..., **Carjan N**., Comp. Phys. Comm. **179** (2008) 466.
2.3.10.15. **Carjan N**., and **Rizea M**., Phys. Rev. C **82** (2010) 014617.
2.3.10.16. **Rizea M**., **Carjan N**., Comp. Phys. Research Trends, Nova Science Publishers (2007) 185.
2.3.10.17. **Silisteanu I**., **Budaca A**. **I**., and Silisteanu A. O., Rom. J. Phys. **55** (2010) 1088.
2.3.10.18. Bastrukov S., Molodtsova I., Podgainy D., and **Misicu S**., Phys. Lett. B **664** (2008) 258.

2.3.10. E-10: Nanophysics and Emerging Materials Team Activity Report (2007-2011)

2.3.10.1. Introduction

Nanophysics is a relatively recent development in scientific research embracing fundamental physics and a large range of applications and technological developments from electronics to medicine. Its interdisciplinary connection to materials science became clear from the beginning of 80-s with the invention of scanning tunneling microscope and discovery of fullerenes. The main reason nanophysics and its interdisciplinary connections hold a great potential for the future is that when things get small, quantum and finite-size effects start to show up and this opens completely new areas of physical phenomena to investigate and unprecedented possibilities for applications. Feynman's foresight that "there is plenty of room at the bottom" is overwhelmingly confirmed.

Novel materials and structures, modern superconducting devices, ultra-sensitive detectors, nanomagnetism & spintronics are just a few prospective areas [11.1].

A major challenge is also posed to theory and requires new approaches and methods to achieve understanding of the new phenomena at the nanoscale.

2.3.10.2. Present status of experimental research, theoretical understanding

One of the important consequences of device miniaturization is that their properties differ significantly from those of the bulk systems. For instance, in magnetic nanostructures (particles, clusters, wires etc.) size reduction can be beneficial for magnetism due to the decrease of demagnetization field and suppression of domain wall formation. At the nanoscale these factors can outweigh the destructive impact of fluctuations which is generally known to increase with smaller size or dimensionality. At the same time, nano-composite materials show magnetic behavior at odds with a long-standing theory. Thus, experimental research has shown that the famous Bloch law of magnetization is not valid for ferromagnetic clusters and nano-particles and one usually has to resort to a phenomenological formula instead. Moreover, recent experiments reported a sudden increase of magnetization at relatively high temperatures in Fe and Co nanoparticles which was interpreted as a BEC phenomenon, raising a great deal of controversy.

In addition to quantum effects, small size brings about strong particle correlation effects, as has become clear from the studies of other kind of novel materials with low-dimensionality which support high-temperature superconductivity (e.g. cuprates and pnictides). High critical temperatures *Tc* (presently over *135 K* at ambient pressure in $Hg_{0.2}Tl_{0.8}Ca_2Ba_2Cu_3O_8$), magnetic fields (dozens of Tesla) and supported electric currents (10^{11} A/m^2), as well as the quantum coherent nature of the superconducting state, are at the origin of their multiple applications. Among many of their unusual properties, experiments have revealed their intrinsic inhomogeneity (Cooper pairs, lattice, magnetic, charge density etc.) with a typical modulation in the nanoscale range. The key reason behind this and other puzzling properties, not described by conventional BCS or Fermi liquid theories, is the presence of strong electron correlations, pervading even the "normal" state: existence of pseudogap in the single-particle spectrum, the resistivity which is proportional to the temperature, temperature dependent Hall coefficient, non-Korringa nuclear-spin relaxation rate, anomalous doping-dependent isotope shift, violation of standard sum rules (e.g. the Luttinger theorem), unexplained doping dependent accumulation of a large optical spectral weight in the "intra-gap", anomalous softening of some phonon modes, unaccounted by ab-initio LDA calculations, presence of kinks in the electronic dispersion etc. The underlying mechanism of pairing remains a puzzle and a comprehensive theory of high-Tc continues to be a "hot topic" of condensed matter physics.

Due to the strong confinement, the quasiparticles and excitations in nanoscopic objects and nano-devices undergo changes of dimensionality as the temperature decreases, typically in a temperature range of the order of 1 K or below. These changes of dimensionality produce in general dramatic changes in the thermal and transport properties of these objects which maybe used with success in applications in many different areas, like the construction of ultra-sensitive nano-devices [11.2-4], q-bits for quantum computing, nano-resonators, etc. Moreover, the quasiparticles do not obey anymore the typical boson and fermion exchange symmetries, but a more general anyon symmetry [11.5-6]. Similarly, the Pauli Exclusion Principle turns into the more flexible fractional exclusion statistics [11.7].

2.3.10.3. Recent results

Starting from an original approach to finite discrete systems, a consistent quantum microscopic theory of magnon gas in ferromagnetic nanoparticles has revealed a different generalized form of the Bloch law [11.8] which contrasts the present phenomenological description of experimentally observed behavior and explains the observed behavior. This approach will be developed further to address the new experimental results on magnetic and lattice properties of nanoparticles and nanocomposite materials.

To account for the correlation effects on the nanoscale in the emerging materials with high Tc we have proposed and studied a semi-phenomenological model which takes into account electron interaction with phonons and other excitations [11.9-10]. This has revealed the existence of unexpected connections between apparently unrelated anomalies such as low and high energy kinks and the “waterfall” structure of the angle resolved photoemission, large softening of some phonon modes seen by inelastic neutron and X-ray scattering, large unexplained peak in the mid-infrared region of optical absorption and Raman scattering. We have developed a theoretical basis for the implementation of phonons as a momentum resolved probe of electronic density excitations in these materials. The utility of this probe is that it covers the energy down from infrared, inaccessible by existing probes. An interesting open issue the study of newly discovered, but having challenging similarities, pnictide superconductors, as well as the class of electron doped cuprates where magnetic excitations seem to play a crucial role.

We studied also the physical properties and performances of ultra-sensitive nanoscopic detectors, designed for space-born astrophysical observations [11.11-13]. We observed a change in the dimensionality of the phonon gas distribution in these devices, which occurs below 1 K, and which has a strong influence on the thermal properties, the heat transport, the interaction of phonons with other quasiparticles and defects. All these findings determine the design of the detectors.

Many nano-devices are made of amorphous materials, obtained by atomic layer deposition on a substrate. Such materials have dynamic defects, which are described as two-level systems. Nevertheless, the standard models, developed for macroscopic amorphous materials are not suitable for the description of nanoscopic objects. In Ref. [11.14-15] we developed a new model for the description of the two-level systems, with general applicability, and we employed it for the heat transport calculations in nano-devices [11.10]. Beside that, the model was applied to explain the anisotropic glassy properties of disordered crystals [11.16-18], a phenomenon that has not been explained for more than two decades.

We studied also the fractional exclusion statistics (FES), which is an extension of the typical Pauli exclusion principle. We showed that the FES formalism was incomplete [11.19-20] and we proposed a revision of this theory [11.21] 18 years from its formulation by F.D. M. Haldane [11.7]. This reformulation opened completely new areas for application of FES [11.22-27] which have not been envisioned before.

References

2.3.11.1 *Trends in Nanophysics: Theory, Experiment, and Technology*. Eds.: A. Aldea, V. Barsan, Springer, 2010.

2.3.11.2 D. V. Anghel, J. P. Pekola, M. M. Leivo, J. K. Suoknuuti, and M. Manninen, Phys. Rev. Lett. **81** (1998) 2958.

2.3.11.3 D. V. Anghel, A. Luukanen, and J. P. Pekola, Appl. Phys. Lett. **78** (2001) 556.

2.3.11.4 T. Kuhn, D. V. Anghel, J. P. Pekola, M. Manninen, and Y. M. Galperin, Phys. Rev. B **70** (2004) 125425.

2.3.11.5 J. M. Leinaas and J. Myrheim, Nuovo Cim. **B37** 1 (1977).

2.3.11.6 F. Wilczek, Phys. Rev. Lett. **49** (1982) 957.

2.3.11.7 F. D. M. Haldane, Phys. Rev. Lett. **67** (1991) 937.

2.3.11.8 S. Cojocaru, Phil. Mag. **91** (2011) 4053.

2.3.11.9 S. Cojocaru, Phys. Rev. B **75** (2007) 014516.

2.3.11.10 S. Cojocaru, Phys. Rev. B **75** (2007) 220502(R) .

2.3.11.11 T. Kuhn, D. V. Anghel, Y. M. Galperin, and M. Manninen, Phys. Rev. B **76** (2007) 165425.

2.3.11.12 D. V. Anghel, T. Kuhn, and Y. M. Galperin, Series in Micro and Nanoengineering **11** (2007) 286.

2.3.11.13 D. V. Anghel and T. Kuhn, J. Phys. A: Math. Theor. **40** (2007) 10429.

2.3.11.14 D. V. Anghel, T. Kuhn, Y. M. Galperin, and M. Manninen, Phys. Rev. B **75** (2007) 064202.

2.3.11.15 D. V. Anghel, Rom. J. Phys. **54** (2009) 65.

2.3.11.16 D. V. Anghel and D. V. Churochkin, Phys. Rev. B **78** (2008) 94202.

2.3.11.17 D. V. Anghel and D. V. Churochkin, J. Pyhs.: Conf. Series **150** (2009) 012002.

2.3.11.18 D. V. Anghel and D. V. Churochkin, EPL **83** (2008) 56004.

2.3.11.19 D. V. Anghel, J. Phys. A: Math. Theor. **40** (2007) F1013.

2.3.11.20 D. V. Anghel, Phys. Rev. Lett. **104** (2010) 198901.

2.3.11.21 D. V. Anghel, EPL **87** (2009) 60009.

2.3.11.22 D. V. Anghel, Phys. Lett. A **372** (2008) 5745.

2.3.11.23 G. A. Nemnes and D. V. Anghel, J. Stat. Mech. **P09011** (2010).

2.3.11.24 D. V. Anghel, EPL **90** (2010) 10006.

2.3.11.25 D. V. Anghel, Rom. J. Phys. **54** (2009) 281.

2.3.11.26 D. V. Anghel, Rom. J. Phys. **53** (2008) 689.

2.3.11.27 D. V. Anghel, Rom. Rep. Phys. **59** (2007) 235.

2.3.11. E-11: Nuclear structure studies using gamma and particle spectroscopy

Studies on Nuclear Structure are traditionally one of the most important and productive fields of research of the NPD. During the last five years new and important results were obtained, most of them already published in mainstream journals. These experimental activities can be formally split into those accomplished at the IFIN-HH Tandem accelerator and those performed at large European facilities (GANIL, GSI, CERN-ISOLDE, INFN, etc). An appropriate balance was kept between these two research components, with the in-house activity benefiting of a strong development of the experimental infrastructure and ingeniously exploiting niches in the nuclear structure knowledge that provide very interesting case studies, and the later addressing top nuclear structure problems, especially concerning the structure of nuclei far from stability and often even near drip lines, accessible at these facilities.

2.3.11.1. Nuclear structure studies at the Bucharest Tandem van de Graaff accelerator

NPD has as main research infrastructure a 9 MV Tandem van de Graaff accelerator. The accelerator was completely refurbished during the recent years, and delivers now, in reliable and reproducible conditions, a large variety of ion beams from protons to medium mass (~60) nuclei (including ^{4}He). The beams can be also pulsed with either a nanosecond pulsing system, or an electrostatic chopper in the range from millisecond to hundreds of seconds. The main nuclear structure activity is based on in-beam γ-ray spectroscopy. During the last 5 years a mixed array of hyper-pure Germanium (HPGe) and $LaBr_3$:Ce fast scintillator detectors has been installed. At present it comprises 8-12 detectors of each of the two types, additional neutron and/or particle detectors being added as needed for different in-beam measurements. Until the end of 2012 a 25 HPGe (of average relative efficiency of 55%) array (ball) will be installed, which can also accommodate up to about 20 $LaBr_3$:Ce detectors, thus reaching an absolute efficiency of around 1% with the HPGe and up to 2% with the fast detectors. Another important experimental development during the last 5 years has been a modern recoil-distance (plunger) apparatus, with piezoelectric computer-controlled movement. The development of the experimental infrastructure immediately triggered the interest of the international nuclear physics community and now the TANDEM Laboratory of IFIN-HH is one of the important experimental centres for the study of nuclear structure in Europe. The research directions pursued with this modernized infrastructure contributed with new results and insights for nuclear structure for many nuclei that could be reached with the available beams. Significant results are as follows.

Determination of lifetimes of excited nuclear states. The most important recent achievement of the NPD is an *original development of the in-beam fast-timing method* that can be used in in-beam measurements, and exploits the full capacity of the mixed γ-ray array, basically employing an off-line procedure for precisely aligning the time signals from the fast $LaBr_3$:Ce detectors. The range of this method was shown to cover half-lives from about 40 ps to several nanoseconds, which is not accessible to large HPGe-only detector arrays, and hardly accessible to other methods, but it is very important because most of the important structure changes are associated with increased lifetimes of the excited states that often fall within this interval. With the actual efficiency and sensitivity of our array, even weak reaction channels with fusion-evaporation or transfer reactions could be approached down to about 5% from the total cross section. Being the only permanent in-beam fast-timing device available at present in the world, the mixed HPGe-$LaBr_3$:Ce was intensively used in the last years in many successful experiments proposed by Romanian and international groups. Results were already published that validate the single-particle character of low-lying states in ^{103,105,107}Cd and ^{199}Tl [2.3.12.1-2], and there is a wealth of results concerning many other nuclei and structure phenomena, a few examples being: the properties of intruder states in ^{34}P (a nucleus close to an island of inversion) and in the neutron-rich ^{67}Cu nucleus. A very sensitive method has recently been developed to analyze Doppler broadened gamma-ray lineshapes measured with the low-recoil, non-selective (α,n) reaction, and applied to determine a large number of lifetimes in the sub-picosecond range in

^{118,120,122}Te [2.3.12.3]. With the new plunger device, the differential plunger method was used to determine the half-life of the 3^- state in the N=Z nucleus ^{44}Ti (of interest to determine the isospin breaking by measuring the interdicted E1 transition from this state), and of some levels in ^{85}Sr.

Measurements of nuclear level scheme characteristics. The existing array allowed to bring important additions to level schemes of different nuclei, such as high-spin and isomeric states in ^{85,86}Y [2.3.12.4], characterization of shape coexistence in ^{72}As, low-spin states assessing E(5) symmetry properties in ^{64}Zn and ^{124}Te, or the observation, for the first time, of excited states of the odd-odd nucleus ^{150}Pm.

Measurements of reaction cross-sections. A target stack activation technique was developed, based on γ-ray activity measurements with a setup of ~50% absolute efficiency, in order to measure cross-sections for the (α,γ) reaction on the ^{115,116,117}Sn nuclei in an energy range of astrophysical interest; other similar measurements are envisaged for this reaction or the (p,γ) reaction.

2.3.11.2. Structure of nuclei far from stability studied experimentally at large facilities

The members of NPD actively participate in international collaborations. Results obtained in some of these, involving large-scale European facilities such as GANIL (Caen), GSI (Darmstadt) (the Rising and PRESPEC collaborations), ISOLDE (CERN), INFN (Legnaro), and JINR (Dubna) will be briefly summarized.

Using the GANIL accelerating complex, SISSI and ALPHA fragment separators and SPEG spectrometer combined with the Chateau de Crystal gamma multidetector, the method of *double fragmentation* [2.3.12.7] was used to obtain spectroscopic information on far from stability nuclei. Thus, the N=28 ^{42}Si nucleus was produced and studied [2.3.12.8]. It was found that, contrary to previous information indicating it as a spherical, near magical nucleus, its 2_1^+ state is rather low (E_x = 780 keV), making this nucleus a good candidate for a group of nuclei called generically “the second island of inversion” around N=28, where, due to the large neutron excess, the magicity of the neutron number breaks down. In similar experiments the proton rich ^{36}Ca showed however that the proton magic number N=20 is preserved even at high neutron excess (its 2_1^+ at E_x = 3036 keV). Other experiments were devoted to the *gamma and conversion electron spectroscopy* of far from stability nuclei. In ^{44}S the second 0+ state was detected at 1365 keV having a predominant spherical structure, while the ground state is deformed, a behavior typical for a nucleus from the second island of inversion [2.3.12.9]. The *beta decay* of ^{34}Al revealed the existence of an isomeric 0_2^+ state in ^{34}Si at 2.7 MeV with an oblate deformation while the g.s. is spherical (clear signs of closeness to the first island of inversion around N=20) and a 1^+ β-isomer (26 ms) of intruder type in ^{34}Al that populates a similar isomeric state in ^{34}Si; the spectroscopy of ^{26}F (similar in structure to the magic ^{24}O) for which an excited 2^+ state has been assigned for the first time. Another research line was the study of *two proton decay* of the few existing candidates using a very performing experimental device: a time projection chamber (TPC) that can visualize (measure) the parameters of the two emitted protons [2.3.12.10]. Three nuclei were measured: ^{45}Fe, ^{54}Zn and ^{43}Cr. The data, clearly indicating a symmetric energy partition between the two protons, were successfully corroborated with a sophisticated three body theoretical model [2.3.12.11]. An interesting finding is the situation in ^{43}Cr in which beta delayed three proton emission could be clearly observed together with one and two proton decay. Elastic scattering of ^{17}Ne on protons in inverse kinematics at zero degrees allowed the determination of a number of resonances in the unbound nucleus of astrophysical interest ^{18}Ne, that changed the expectation for observing galactic gamma rays coming from the ^{18}F(p,α)^{15}O reaction in the sense of drasticaly decreasing such probability [2.3.12.12].

Within the Rising campains at GSI-Darmstadt relativistic beams obtained with the fragment separator (FRS) were used to perform spectroscopic measurements of exotic nuclei. Spin alingnment was observed for the first time in nuclei produced in fission and fragmentation reactions, both at relativistic beam energies, and used to measure g-factors of isomeric states in ^{126,127,128}Sn and ^{192}Pb (the g-Rising project at GSI). Beta-delayed and isomer spectroscopy was performed for neutron-rich Ta and W nuclei produced also in relativistic energy fragmentation of a ^{208}Pb beam, leading to the observation of a possible subshell effect at A≈190.

A variety of nuclear spectroscopy studies has been performed at INFN-Legnaro, mainly with the CLARA γ-ray array + PRISMA spectrometer setups, and recently with the AGATA demonstrator. The isospin mixing was investigated for the mirror nuclei ^{35}Ar – ^{35}Cl and ^{67}As – ^{67}Se [2.3.13.5]; the former case, for example, revealed striking assymetries between the analogue states of the two level schemes, that could be explained by large-scale shell model calculations as due to multiple Coulomb and and relativistic electromagnetic spin-orbit interactions. By bombarding ^{238}U with the neutron-rich beams like ^{64}Ni or ^{48}Ca, a number of exotic neutron-rich nuclei could be populated by multinucleon transfer reactions and studied. The very neutron-rich nucleus ^{96}Kr nucleus was populated in the fission of ^{238}U induced by a ^{136}Xe beam, and its 2_1^+ state was assigned [2.3.12.6], thus allowing for the first time to follow the evolution of the collectivity of the Kr isotopes up to N=60, that reveals a relatively sudden onset of deformation similar to that in the Zr and Sr chains. Other results concern the level schemes of neutron-rich nuclei ^{40,41}S, ^{51}Ca, ^{52}Sc, and ^{168,170}Dy, and measurements of isomeric states in ^{125,127,129}Sn nuclei.

At ISOLDE/CERN our researchers have recently started to participate at experiments with radioactive beams, such as Coulomb excitation measurements of neutron-rich Kr isotopes, and lifetime determinations with the fast timing method in beta-gamma coincidences. The experience gained in Bucharest concerning the use of $LaBr_3$:Ce γ-ray detectors is being used to increase the sensitivity and efficiency of such measurements at ISOLDE. Several very interesting physics results were obtained in the last two years using the "fast timing" technique by the Romanian group involved in the ISOLDE collaboration, good examples in this sense being the determination of new level half-lives and isomeric states in very neutron-rich nuclei around ^{81}Ga and ^{66}Fe.

The collaboration with spectroscopy groups from JINR-Dubna, employing a γ-ray array and the Vassilissa recoil spectrometer led to the detailed study of level schemes of heavy nuclei in the trans-Fermium region, such as ^{253}No and its daughters. Such improved and reliable level scheme are important in order to validate and constrain nuclear models in this region.

One should also mention that the NPD has started, during this time period, activities related to the preparation and testing of detector and different other spectrosopy measuring setups within the frame of our participation at FAIR (GSI-Darmstadt). In this respect the studies performed in IFIN-HH about the new fast scintillators has also proved of interest for future detector developments within the NUSTAR collaboration at FAIR.

References

2.3.12.1. N. Marginean *et al.*, Eur Phys J. A **46** 329-336 (2010).
2.3.12.2. S. Kisyov *et al.*, Phys. Rev. C **84**, 014324 (2011).
2.3.12.3. C. Mihai *et al.* Phys. Rev. C **83** 054310 (2011).
2.3.12.4. C. Rusu *et al.* Eur Phys J A 44 31-41 (2010).
2.3.12.5. R. Orlandi *et al.* Phys Rev Lett **103** 052501 (2009).
2.3.12.6. N. Marginean *et al.* Phys Rev C **80** 021301(R) (2009).
2.3.12.7. M. Stanoiu *et al*. Phys Rev C **69** 034312 (2004)
2.3.12.8. B. Bastin *et al*. Phys Rev Lett **99** 022503 (2007)
2.3.12.9. C. Force *et al*. Phys Rev Lett **105** 102501 (2010)
2.3.12.10. B. Blank *et al*. NIM A **613** 65 (2010)
2.3.12.11. P. Ascher *et al*. Phys Rev Lett **107** 102502 (2011)
2.3.12.12. J. C. Dalouzy *et al*. Phys Rev Lett **102** 162503 (2009)

2.3.12. E-12: Astroparticles Physics Activity Report

2.3.12.1. Introduction

Astroparticle Physics (AP) is a new multidisciplinary field of research studying the particles coming from the Universe, where nuclear and particle physics, astronomy, astrophysics and cosmology converge. AP seeks to answer to fundamental questions: where do cosmic rays come from, what is the view of the sky at extreme energies, what is the role of neutrinos in cosmic evolution.

In 2007 a network ROASTROPART (ROmanian ASTROPARTicles) for collaborative experimental and theoretical studies in the field of Astroparticle Physics in Romania was established between IFIN-HH Bucharest-Magurele, (Institute of Physics and Nuclear Engineering), ISS Bucharest-Magurele (Institute of space Science), UB (University of Bucharest) and UPB (University Polytechnica Bucharest) Based on the experience accumulated by the above partners in the field of astroparticle physics, Romania was accepted as partner in ASPERA FP7 project and as observer in ApPEC (Astroparticle Physics European Coordination).

2.3.12.2. Investigation of HECR with participation in the large international experiments

One of the prime objectives of the vast majority of cosmic ray studies is to measure their energy and to establish the mass distribution of the primary particles in the cosmic radiation. This kind of information can probe numerous theories on the origin of high energy particles and production mechanisms, acceleration and propagation mechanisms and high energy hadronic interaction models.

The energy spectrum of the cosmic rays has monotonous $E^{-\gamma}$ dependence, interrupted by several discontinuities, which have to be clarified. The first one, called “knee”, (due to the resemblance in shape with a bent human leg), has been found at around 10^{15} eV due to the CR light component decrease. Around 10^{17} eV, another discontinuity, “knee”, (due to the heavy component), appears and around (10^{19} -10^{20}) eV, the spectrum flattens in the region called “ankle. The very high energetic primary cosmic ray is interacting with the nuclei of Earth's atmosphere and secondary particles are produced developing EAS, (Extensive Air Shower), which arrive at the ground distributed over a large area, and can be signaled by complex detectors spread on large surface. Thus, the effects of the cosmic radiation in the Earth's atmosphere, are obtained by investigating EAS (avalanches of particles), using the atmosphere as the detector medium[2.3.13.1].

The reconstruction of the primary cosmic rays spectrum via the EAS observation, is based on the simulations of the development of the particle cascades in the atmosphere[2.3.13.2], where the most known program is CORSIKA code, setup in KIT, Karlsruhe, Germany[2.3.13.3].

The experiment KASCADE-Grande, built in the Karlsruhe Institute of Technology, (KIT), Germany, area 700x700 m^2, with an international collaboration between Germany, Italy, Poland and Romania (IFIN-HH and UB), is designed to measure EAS initiated by primaries with energies in the 10^{14} -10^{18} eV range for the investigations of the "knees" range[2.3.13.4, 2.3.13.5]. This objective is directly linked to the hottest topics in modern astrophysics and cosmic ray physics for the proposed energy range: interpreting spectral features (i.e. the second knee or the ankle) and identifying transition effects in order to understand the origin of cosmic rays (galactic/extragalactic), the production and acceleration mechanisms[2.3.13.6].

At the KASCADE-Grande experiment, the Romanian partner has brought fundamental contributions by developing a new and independent reconstruction technique of the energy and the mass of the primary cosmic particle from the information of charged particles density in air showers[2.3.13.7].

Based on a successful Romanian-German co-operation in the experiments KASCADE-Grande si LOPES, since March 2011 Romania (with the participation of IFIN-HH, UPB and UB) is accepted as Associate Country with Germany in Pierre Auger Observatory, the largest air showers hybrid detector in the world, placed in the Mendoza province, Argentina, with over 1600 detector stations spread over an area of 3000 km^{2}. The experiment is being operated by an international collaboration whose members come from universities and institutes in 19 countries. The Romanian partner will use its expertise in the cosmic ray studies using radiotechnique and will contribute to the investigation of cosmic rays by analyzing the experimentally recorded EAS data, in order to reconstruct relevant observables of the cosmic radiation. The novelty of our investigation lays in the use of data from the two above experiments whose optimal energy detection ranges overlap and cover together the two spectral features of interest.

2.3.12.3. Studies of the flux and of the charge ratio of the atmospheric muons (local infrastructure)

The muons are the most important EAS component, as they are deep penetrating long living particles, which can inform about the primary cosmic particle. In IFIN-HH Bucharest a detector WILLI has been set up in collaboration with KIT, Germany, to measure and to study the flux and the charge ratio (the ratio of the positive to negative muons) of the atmospheric muons with energy less than 1GeV. We use a new improved method to determine the muon charge ratio by measuring the lifetime of the muons stopped in the matter. The measurements with rotatable WILLI, inclined on 45° direction show a pronounced East-West effect (under the influence of the Earth's magnetic field) in good agreement with simulations data (DPMJET model) and with the East-West effect found in neutrino measurements[2.3.13.8].

The detector is extended to WILLI-EAS by a mini - array of scintillation detectors for studies of the muon charge ratio in EAS, being the unique system in the world to provide data on the muon charge ratio in EAS. Such measurements are expected to provide information about the influence of the geomagnetic field on the atmospheric muons, about hadronic interactions governing the air shower development and about primary mass composition for showers with energies between $(10^{13} – 10^{15})$eV[2.313.9].

The primary cosmic flux can be influenced by the solar activity and this modulation is reflected in the muon flux observed at ground level. Using WILLI detector, the influence of the solar activity on the muon flux will be investigated by measuring the diurnal or unexpected variation of the muon flux[2.3.13.10].

2.3.12.4. Investigation of astroparticles with radio antennas

For the investigation of CR a new experimental technique is developed, the radiodetection of EAS, based on the direct measurement of the electromagnetic pulse created during the passage of the shower through the detector media.

A LOPES experiment, with international participation, (Germany, Holland, Italy, Poland, Romania), is built as an array of radio antennas, in co-location to the KASCADE-Grande setup. It is meant to observe the radio emission from atmospheric showers by an array of antennas operated in coincidence with the scintillation detectors. The production mechanism is investigated by looking at correlations between the radio signal and several shower parameters, inferred from the Grande particle detectors that gather data in coincidence with the radioantennas[2.3.13.11, 2.3.13.12, 2.3.13.13]. In the latest configuration LOPES-3D, the antennas are sensitive to all of the three components of the polarization. Our studies provide a starting point for studies and experimental test for other configuration in Pierre Auger Observatory.

The underground site from Slanic Prahova, with an ultra-low radiation background is a suitable site for high-energy neutrino investigations based on radiodetection. We will investigate the possibility to detect high-energy neutrinos using radio-antenna in the salt mine, an experiment unique in Europe. Neutrinos cannot be directly detected, but they can be indirectly observed through their interactions with ordinary matter. We consider a detection strategy based on coherent radio Cherenkov emission from neutrino-induced electromagnetic showers. In the underground site at Slanic Prahova the experiment would be carried on in salt. The detector should be able to reconstruct the energy and direction of the primary particle based on the measured properties of the electrical field generated by the initial neutrino.

2.3.12.5. Muon detection with Multi Pixel Photon Counter

We will investigate high energy cosmic muons at the ground level and in the underground using a Multi Pixel Photon Counter, (MPPC) Muon Detector representing the next generation of detectors for the cosmic radiation. Such detector, based on a new technology using photodiode SiPM and fast readout electronic allows a better identification of the cosmic particle. It has a compact form, permits to measure the muon flux and the angle of incidence of the muons and it is suitable for cosmic rays observation at ground, in the underground and in the space.

References

2.3.13.1 W. D. Apel.... I.M. Brancus.... et. al KASCADE Collaboration, Phys. Rev. Lett. 107 (2011) 171104

2.3.13.2 W. D. Apel.... I.M. Brancus.... et. al KASCADE Collaboration, J. Phys.G: Nucl.Part.Phys. 36 (2009) 035201

2.3.13.3 W. D. Apel.... I.M. Brancus.... et. al KASCADE Collaboration, J. Phys. G: Nucl. Part. Phys. 34 (2007) 2581-2593

2.3.13.4 W. D. Apel.... I.M. Brancus.... et. al KASCADE Collaboration, Nucl. Instr. and Meth. A 620 (2010) 202-216

2.3.13.5. W. D. Apel.... I.M. Brancus.... et. al KASCADE Collaboration, Astroparticle Physics 31 (2009) 86-91

2.3.13.6 W. D. Apel.... I.M. Brancus.... et. al KASCADE Collaboration, Nucl. Instr. and Meth. A 630 (2011) 222-225

2.3.13.7 O. Sima... I.M. Brancus... et al., SHOWREC – A program for reconstruction of EAS observables from KASCADE-Grande observations, internal report Forschungszentrum Karlsruhe GmbH, Karlsruhe, 2004

2.3.13.8 I.M. Brancus et al, Nuclear Physics B (Proceedings Supplements), 175-176 (2007) 370-373

2.3.13.9 I.M. Brancus et al, Nuclear Physics B (Proceedings Supplements), 196 (2009) 227

2.3.13.10 A. Saftoiu, ...I.M. Brancus et al., Romanian Journal of Physics 56 (2011) 664-672

2.3.13.11 W.D. Apel.... I.M. Brancus.... et. al LOPES collaboration, Nucl. Instr. and Meth. A, doi:10.1016/j.nima.2010.11.141

2.3.13.12 W. D. Apel.... I.M. Brancus.... et. al LOPES collaboration, Astronomy & Astrophysics, 462 (2007) 389-395

2.3.13.13 W.D. Apel.... I.M. Brancus.... et. al LOPES collaboration, Nucl. Instr. and Meth. A, doi:10.1016/j.nima.2010.11.081

2.3.13. E-13: Nuclear Reaction Mechanisms at Low and Medium Energies

The description of nuclear reactions represents an important test for both the appropriateness of reaction mechanism models and evaluation of nuclear data requested for applications. The following activities have been carried on in this respect at the IFIN-HH/DFN.

2.3.13.1. Measurement of reaction cross-sections

Gamma-ray measurements have been used to determine reaction cross sections [2.3.14.1-2]. A setup and a method were developed, by which small reaction cross-sections can be measured, especially at energies close to the Coulomb barrier, where, for many nuclei, such data are of astrophysical interest. The method is that of the target stack activation: a stack of targets is irradiated to produce the radioactive species whose activities are measured after the irradiation has stopped. Accurate and reliable measurements have been achieved by precise determinations of the target foil thicknesses, real time recording of the beam intensity during the irradiation, and detection of the γ-rays with a close geometry setup with accurately determined efficiency (with summing effects taken into account). An example of such measurements is shown in Fig. 2.3.14.1, where cross-sections for several reactions (α,n) and (α,γ) were determined by activating stacks of ^{116}Sn and (^{116}Sn + ^{115}Sn) targets [2.3.14.2]. Both experimental determinations and consistent theoretical descriptions of cross sections of reactions induced by light projectiles have been performed.

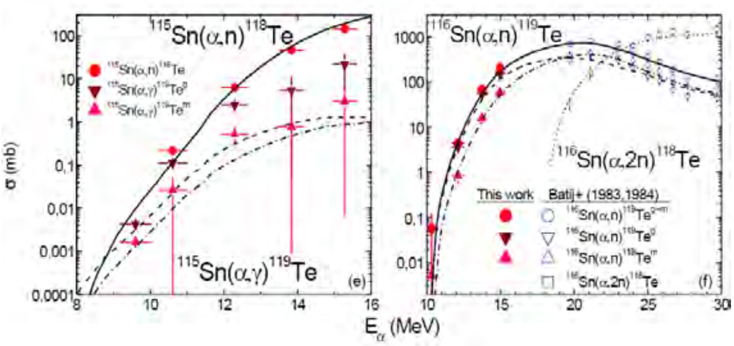


***Fig. 2.3.14.1**. Cross-sections for (α,n) and (α,γ) reactions measured with the stack foil activation technique and compared to statistical plus preequilibrium model calculations (curves) [2.3.14.2].*

During the last eight years, in close collaboration with teams from EC-JRC-IRMM-Geel and other research institutes (e.g. IRES Strasbourg France) a considerable amount of high quality nuclear data of interest for energy applications has been produced. Among them, should be mentioned the accurate, high resolution neutron inelastic scattering cross section measurements on various materials of interest for the development of Generation IV fission reactors. The Romanian physicists had an important contribution in the development of experimental devices (e.g. GAINS array of Ge detectors) [2.3.14.3], the related data analysis, and results inclusion in nuclear databases. They take an active part in a number of European research programs like EUFRAT, ANDES and ERINDA. Further, the so-called surrogate method that tries to infer neutron induced cross sections based on the investigation of particle-induced reactions is currently under investigation. Thus, a certain nucleus is excited through two different reactions *(α,n)* and *(n,n')* leading to the same compound nucleus, making possible a comparison of the γ-production cross sections while level cross sections and the reaction cross sections are determined with high accuracy.

2.3.13.2. Consistent direct, pre-equilibrium emission and statistical model analyses

Basic problems are still present in neutron data evaluations even in the advanced nuclear reaction models presently involved within, e.g., the Joint Evaluated Fission and Fusion File (JEFF) evaluated nuclear data project. The nuclear data topic is considered a critical task for selecting and validating the best materials for constructing fusion power reactors, so that it is a priority of the EC domestic agency Fusion for Energy (F4E) related to the International

Thermonuclear Experimental Reactor (ITER) and International Fusion Material Irradiation Facility (IFMIF) fusion programmes.

Overall, the theoretical description of the neutron interactions with nuclei needs significant improvements that could be validated by suitable description of experimental data, e.g. [2.3.14.4], within also the F4E *Framework Partnership Agreement* No. F4E-FPA-168 (2011-2014). At the same time, following our local results as well as in order to additionally check them, connection of computational studies and further measurements is planned. It is thus concerned participation to proposal and performance of further experiments at n_TOF/CERN and NFS/SPIRAL-2 facilities.

A particular case is that of the deuteron-induced reactions since, due to the weak binding energy of the deuteron, B=2.224 MeV, there is a variety of reactions initiated by the neutrons and protons coming from deuteron breakup. Simultaneous analysis of deuteron elastic scattering and induced activation appears essential for a consistent input of nuclear model assessment, for further estimation of deuteron interaction data. Third, usually neglected or very poorly taken into account, the stripping *(d,p)* and *(d,n)* and the pick-up *(d,t)* reactions description is still an open question. The IFIN-HH group aims to deeper understanding of all above-mentioned problems of deuteron interactions, e.g. [2.3.14.5-6], also through the IAEA *Research Agreement* No. 14996 (2008-2012) within Fusion Evaluated Nuclear Data Library (FENDL-3) project of IAEA Nuclear Data Section.

A simultaneous analysis of the α-particle elastic scattering and induced activation has been also essential for a consistent input of nuclear model assessment for the α-particle OMP [2.3.14.7-11] that led to a recommended segment of the Reference Input Parameter Library (RIPL-3) project.

2.3.13.3. Clusterized nuclear structures: from nuclei to supernovae and neutron stars

(a) Under different circumstances, nuclear matter ceases to be uniform and gets clusterized. In the case of infinite, homogeneous, neutral matter clusterization occurs when the system enters into the spinodal instability region predicted by mean field models. The phenomenon is thought to be visible under laboratory conditions in the multifragmenting nuclei.

(b) In the baryonic matter constituting the main ingredient of supernovae and neutron stars, clusterization stems from the quenching of phase coexistence because of the long-range Coulomb interactions.

(c) Symmetric dilute matter suffers α-particle condensation in order to minimize its energy.

The following results have been obtained within the above-mentioned fields of real actual interest.

(a) Following a research line started in the middle of the '90s, our group investigated the possibility to access the asymmetry term of the nuclear equation of state out of isoscaling and isotopic yield widths. Though the answer is positive, the interpretation of experimental data rests far from being trivial, as conservation effects significantly blur the signals [2.3.14.12-16].

(b) The expertise in statistical models with cluster degrees of freedom allowed us to propose a phenomenological model for the homogeneous-inhomogeneous baryonic component of stellar matter, characterize the crust-core transition as a continuous (2nd order) one and plot the equations of state over broad ranges of density, temperature and proton fraction [2.3.14.17].

(c) Finally, collaboration with IPN-Orsay allowed us to study from the experimental perspective the existence of alpha-particle condensates in finite nuclei. Complete kinematical characterization of individual decay events reveals that 7.5% of the particle decays of the Hoyle state correspond to direct decays in three equal-energy alpha particles. This is the first experimental evidence of alpha-condensation in nuclei [2.3.14.18].

Measurements performed at GANIL by means of positive sensitive detectors coupled to the 4pi INDRA array, in experiments to which we participated, have brought new probes into superheavy element stability. In cooperation with LPC, we have developed new semiconductor (diamond and silicon) detectors. A special attention was paid to the description of the current pulses induced by heavy ions in n-TD silicon ones, to be used for the reaction product identification in the framework of the FAZIA collaboration [2.3.14.20].

2.3.13.4. Threshold phenomena in nuclear reactions and nuclear structure

The nuclear threshold states are located both above (low energy resonances) and below (weakly bound states) breaking threshold. They have peculiar properties determined by the nearby threshold: spatial extension and threshold renormalization of spectroscopic factors. The problem of interplay between threshold phenomena and spectroscopic factors is a priority result of our researchers (C. Hategan, 1971, 1978) [2.3.14.21] and now it becomes a topical problem in the study of exotic weakly bound nuclei (Gamow shell model).

The very low energy resonances relevant for nuclear reactions in stars do exhibit threshold properties as renormalization of reduced widths and Thomas-Ehrman shift of analogue states. The study of astrophysical threshold states has to consider such "threshold effects" on nuclear states, *e.g.* ^{23}Mg and ^{27}Si proton threshold states involved in Ne-Na and Mg-Al stellar cycles. These cycles are not important as source of energy but rather in nucleosynthesis of elements between ^{20}Ne and ^{27}Al as well as for understanding of isotopic anomalies.

We realized a detailed theoretical study of the radiative capture reaction ^{22}Na(p,γ)^{23}Mg at stellar temperature using the experimental information on the mirror states in ^{23}Na [2.3.14.22]. We are studying now the reaction ^{26}Al(p,γ) ^{27}Si relevant for the cosmic abundance of ^{26}Al as determined by COMPTEL gamma ray telescope and the ^{26}Mg/^{27}Al anomaly discovered in Allende meteorite.

We applied our expertise in threshold effects also to the description of Borromean nuclei [2.3.14.23] and atomic systems [2.3.14.24].

References

2.3.14.1. I. Căta-Danil, D. Filipescu, M. Ivaşcu *et al.*, Phys.Rev.C 7**8** (2008) 035803.
2.3.14.2. D. Filipescu, V. Avrigeanu, T. Glodariu *et al.*, Phys. Rev. C **83** (2011) 064609.
2.3.14.3. D. Deleanu *et al.*, Nucl. Instr. Meth. A **624** (2010) 130.
2.3.14.4. M. Avrigeanu, A.A. Filatenkov, R.A. Forrest *et al.*, Nucl. Phys. A **806** (2008) 15.
2.3.14.5. M. Avrigeanu, W. von Oertzen, R.A. Forrest *et al.*, Fus. Eng. Design **84** (2009) 418.
2.3.14.6. M. Avrigeanu and A. M. Moro, Phys. Rev. C **82** (2010) 037601.
2.3.14.7. M. Avrigeanu and V. Avrigeanu, Phys. Rev. C **79** (2009) 027601.
2.3.14.8. M. Avrigeanu, A.C. Obreja *et al.*, At. Data Nucl. Data Tables **95** (2009) 501.
2.3.14.9. M. Avrigeanu and V. Avrigeanu, Phys. Rev. C **81** (2010) 038801.
2.3.14.10. M. Avrigeanu and V. Avrigeanu, Phys. Rev. C **82** (2010) 014606.
2.3.14.11. V. Avrigeanu and M. Avrigeanu, Phys. Rev. C **83** (2011) 017601.
2.3.14.12. Ad. R. Raduta and F. Gulminelli, Phys. Rev. C **75** (2007) 024605.
2.3.14.13. Ad. R. Raduta and F. Gulminelli, Phys. Rev. C,**75** (2007) 044605.
2.3.14.14. Ad. R. Raduta et al., Eur. Phys. J. A **32** (2007) 175.
2.3.14.15. Ad. R. Raduta and F. Gulminelli, Phys. Rev. C **80** (2009) 024606.
2.3.14.16. Ad. R. Raduta, Phys. Rev. C **80** (2009) 014602.
2.3.14.17. Ad. R. Raduta, F. Gulminelli, Phys. Rev. C **82** (2010) 065801.
2.3.14.18. Ad. R. Raduta et al., Phys. Lett. B**705** (2011) 65.
2.3.14.19. Ad. R. Raduta et al., Int. J. Mod. Phys. E **20** (2011) 902.
2.3.14.20. M. Parlog, H. Hamrita, and B. Borderie, Nucl. Instr.Meth.Phys.Res. A**613** (2009) 290.
2.3.14.21. H. Comisel, C. Hategan *et al*., Phys. Part. Nuclei **41** (2010) 574.
2.3.14.22. H. Comisel, C. Hategan *et al*., Phys. Rev. C **75** (2007) 045807.
2.3.14.23. C. Hategan, R.A. Ionescu, H.H. Wolter, Mod. Phys. Lett. **A22** (2007) 1469.
2.3.14.24. D. Ionescu, R.A. Ionescu, J. Electroanal. Chem. **650** (2010) 205.

2.3.14. E-14: Nuclear techniques for environment and materials investigation

2.3.14.1. Introduction

During the last years, due to the impressive development of technology, more and more specific techniques designed to help the industry have been developed or improved in IFIN-HH. For materials characterization, in our institute is a sustained research activity by using Ion Beam Analysis (IBA), Rutherford Backscattering Spectrometry (RBS), Elastic Recoil Detection Analysis (ERDA) and Non-Rutherford Backscattering Spectrometry (NRBS) techniques. For biomedical studies of human diseases Proton Induced X-Ray Emission (PIXE) applications are intensive used [2.3.15.1].

Determination of major, minor, and trace elemental concentrations in environmental samples (soil, sediment, water, tree leaves, and vegetables) are performed by atomic and nuclear techniques, with the scope of anthropogenic pollution control. Improvement of the air quality in urban areas is one of the main purposes of the European environmental policy. Certain plant species are highly sensitive to particular air pollutants and show specific responses to pollution effects. Assessment of accumulation of anthropogenically emitted heavy metals and other toxic elements by different vascular plants in order to select species able to accumulate the elements in excessive amounts being tolerant to them was carried out in urban ecosystems of 7 European towns, including Bucharest (BSEC project) [2.3.15.2].

The environmental pollution by industrial activities presents a significant health risk to human beings. Soil pollution is one of the most serious problems in the world, with long term consequences on human life. One of the possible pathways of pollutants from the environment to human organisms is the consumption of foodstuffs polluted via air and soil by industrial activities. (PNII Tipsarmer project).

Other techniques, like neutron analysis methods, are among the most important tools for studying the structure and dynamics of matter on a wide range of scales from atomic through mesoscopic to macroscopic [2.3.15.3]. Neutron scattering refers to a family of techniques in which neutrons are used as probes to determine structural and dynamic properties of materials by measuring their change in direction and energy after interacting with a sample. The use of neutron techniques in combination with traditional characterisation techniques used in condensed matter science can provide a unique insight into novel materials, providing the knowledge to develop new formulations [2.3.15.4].

Muons comprise an important contribution of the natural radiation dose in air (approx. 30 nSv/h of a total dose rate of 65–130 nSv/h), as well as in underground sites even when the flux and relative contribution are significantly reduced. The flux of muons observed underground can be used as an estimator for the depth in mwe (meter water equivalent) of the underground site. The water equivalent depth is important information to devise physics experiments feasible for a specific site [2.3.15.5].

2.3.14.2. Present status of experimental research, theoretical understanding, ...

Here is international access to a 9 MV Van de Graaff Tandem accelerator, dedicated reaction chambers for measurements using IBA techniques, detectors for charged particle spectroscopy, a ΔE-E detector telescope (ionization chamber-silicon detector), programs for data analysis. Among the various micro analytical techniques used today to investigate the physical properties of solid surfaces, microanalysis using a MeV charged particle beam is a tool, particularly well suited to study physical and chemical phenomena taking place in the near-surface region of solids. Rutherford backscattering of charged particles (RBS), mainly ^{1}H and ^{4}He ions, permits the determination and depth profiling, with a depth resolution of l00 - 300 Å in regions of a solid up to 1 μm. As this method is essentially non-destructive, it has been frequently used to determine the stoicheometry and thickness of thin films (e.g. SBN thin films growth by RF plasma beam assisted pulsed laser deposition, sol-gel PZT films and

$YBa_2Cu_3O_{7-x}$ films obtained by pulsed laser deposition). A severe disadvantage of conventional RBS is low sensitivity for light elements. The Rutherford scattering cross section is proportional to the square of the nuclear charge of the target nucleus. Therefore, the scattering peaks from light elements such as C, N and O are superimposed on a relatively high background due to backscattering from heavy elements in the sample. In recent years, backscattering using ^{4}He ions with energies higher than 2 MeV has been extensively used in materials analysis to enhance the sensitivity for light elements. Advantages associated with the use of higher energy ^{4}He beams are: improved mass resolution, increased probing depth and improved accuracy in measured stoicheometric ratios. For example, the Non-Rutherford Backscattering Spectrometry (NRBS) technique has been used to determine the stoicheometry and thickness of SiC layers on silicon. When high energy ^{4}He ion backscattering is used for quantitative analysis of light elements the elastic cross sections for these elements should be known. There exists a complement to RBS which allows unambiguous particle identification and which is also quantitative: elastic recoil detection analysis (ERDA). ERDA is based on the detection of low–mass target elements, which are ejected by a heavier projectile; the depth distribution is derived from the energy spectrum of the recoils. Since the detected particle is the recoil, it is possible to discriminate between different elements by their nuclear charge or mass. Different detection techniques have been used to achieve this separation. Based on the method mentioned above a collaboration with CSNSM-Orsay (France) has been established. The main object of this collaboration is the study of the modifications, induced by He and Ar ions implantation and thermal treatments, of zirconia, spinel and SiC, using IBA methods and other advanced techniques. In the last years the activity of the collaboration was devoted to the investigation of the unusual behaviour upon thermal annealing of the disorder induced into spinel,zirconia and SiC crystals by implantation of noble gases (particularly He and Ar). The rather unusual evolution of the disorder profiles extracted from Rutherford backscattering spectra registered in channeling conditions (RBS/C) by using the McChasy Monte-Carlo simulation code was further investigated. Increase of damage was observed in annealed samples of spinel (and also in zirconia) but not in SiC. In order to further investigate the reasons of this particular behaviour, our activity was concentrated on the study of the microstructural modifications.

Knowing the distribution of trace elements in biological systems (tissue, blood etc.) is useful in understanding the pathophysiology of human diseases. These goals are achieved by using the PIXE method. In the frame of this theme, in collaboration with Carol Davila University, there were obtained experimental results concerning the involvement of oligoelements, enzymatic activity and free radicals in cutaneous cancer and other human diseases. In the last 4 years, the following issues were addressed:

- correlation between tissue and blood concentrations of trace elements in patients with cancerdisease;
- comparative study of the involvement of trace elements and metallo-enzymes in the molecular mechanisms associated with skin tumor disease; the antioxidant status in patients with skin cancer;
- the transitional metals – important factors in malignant transformation.

Neutron scattering analysis is in fact a combination of methods like QENS (Quasi Elastic Neutron Scattering), SANS (Small Angle Neutron Scattering) and INS (Inelastic Neutron Scattering). The recent studies are focused on:

- the study of sodium alginate–heavy water molecular dynamics behavior by INS and QENS;
- the study of structure and physical properties of elastomers filled with tiny ferroparticles by SANS:
- developing theoretical models for small-angle scattering (SAS) intensity from nano/micro fractals using a deterministic fractal framework.

For muon detection a mobile detector for performing measurements of the muon flux was developed in IFIN-HH, Bucharest. Consisting of two scintillator plates (approx. 1 m^2) that measure in coincidence, the detector is installed on a van that facilitates measurements at different locations at the surface or underground. The muon flux measurements could be used for geological studies, e.g. to explore variations in the rock density above the observation level. The mobility of the detector implies a considerable practical flexibility of using this procedure of measuring muon flux differences for various purposes.

References

2.3.15.1. G. Velisa, A. Debelle, L. Vincent, L. Thomé, A. Declémy, D. Pantelica, S. Antohe, Journal of Nuclear Materials **416** (2011) 216-220.

2.3.15.2. A. Ene, A. Pantelica, Radiochimica Acta **98** (1) (2010) 53-57.

2.3.15.3. M. Petrascu, A. Constantinescu, I. Cruceru, M. Duma, M. Giurgiu, A. Isbasescu, H. Petrascu, S. Serban, V. Stoica, I. Tanihata, W. G. Lynch, C. Bordeanu, M. A. Famiano, K. Ieki, Nuclear Physics A, **790** (2007) 235C-240C.

2.3.15.4. V. Tripadus, J.M. Zanotti, M. Statescu, O. Constantinescu, S. Mitra, D. Aranghel, Chemical Physics, **365** (2009) 30-37.

2.3.15.5. Bogdan Mitrica, Romul Margineanu, Sabin Stoica, Mirel Petcu, Iliana Brancus & col., Nuclear Instruments and Methods in Physics Research A **654** (2011) 176–183.

2.3.15. E-15: Exotic Atoms and Atomic Interaction Processes

2.3.15.1. Introduction

The aim of our research team is to study manifestations of the atomic interactions in different ways, in an energy region which span from several eV (the energies involved in ionization and charge exchange processes in a ECR plasma) up to 10^{10} eV, testing of Quantum Chromodynamics (QCD) at low momentum transfer by using hadronic-atoms, like $\pi^+\pi^-$ or πK. There are also investigations in understanding the physics underlying the operation of experimental devices, such as the ECR ion source or diamond detectors for heavy ions.

In 2004 the DIRAC Collaboration [2.3.16.1,2,3,4,5,6] at CERN, with IFIN-HH as founding member, has proposed an experiment to test some predictions of nonperturbative Quantum Chromodynamics (QCD) with hadronic atoms. According to the MEMORANDUM OF UNDERSTANDING, IFIN-HH group has to design, construct and operate a ***Preshower Detector*** (PSh) for pion and electron signal separation, respectively for real and background events. The ***Preshower Detector*** was realized and installed in East Hall, along with DIRAC setup (see **Fig.1,2**), and now are taking experimental data for lifetime measurement of $\pi^+\pi^-$ and πK hadronic atoms.

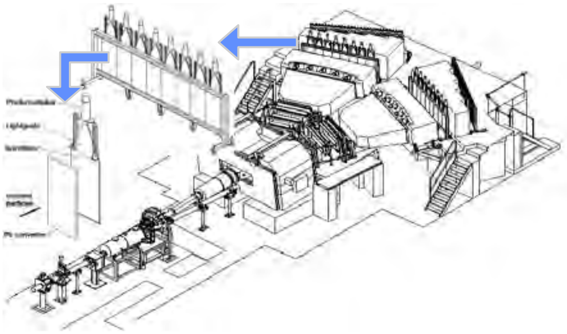


Figure 1. The new DIRAC setup with Preshower Detector (pointed by blue arrows).

Figure 2. Mounting Preshower Detector at CERN – East Hall

2.3.15.2. Present status of experimental research, theoretical understanding, and future challenges

Quantum Chromodynamics (QCD) has successfully been tested only in the perturbative region of *high momentum transfer* (Q >1 GeV) or equally, at *short relative distance* $\Delta r \approx \hbar c/Q$ ($\Delta r \leq 0.2$ *fm*). In this region, the constituent quarks behave as weakly interacting (*asymptotic freedom*), nearly massless particles. As any gauge theory with massless fermions, QCD presents *chiral symmetry*. In the nonperturbative region of low momentum transfer $Q < 100$ *MeV/c*, or at large distance $\Delta r > 2$ *fm*, *asymptotic freedom* is absent, and *quark confinement* with massive quarks takes place. Therefore, the *chiral symmetry* of QCD is *spontaneously broken*. Due to the fact that hadronic interactions at large distance ($\Delta r > 2$ *fm*) are described by pionic degrees of freedom, the Chiral Perturbation Theory (ChPT) [2.3.16.7] as the non-perturbative QCD theory, is replacing the QCD *quark degrees of freedom* (see **Fig. 3a)** by *pion degrees of freedom* (see **Fig. 3d)**.

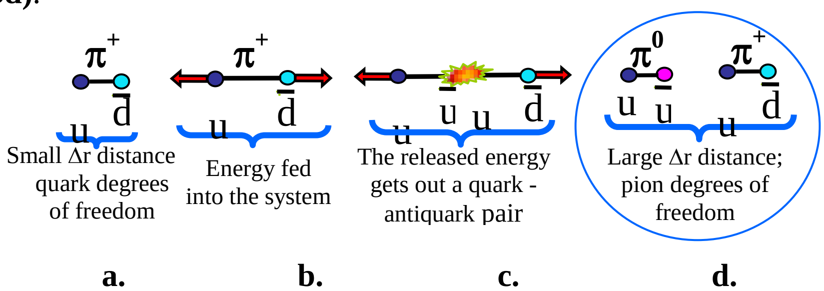


Figure 3. Quark transition from perturbative (a) to nonperturbative (d) behavior

We are searching for $\pi^+\pi^-$ and πK hadronic atoms. Due to the presence of *strong interaction*, their energy levels are shifted. The real part of the energy shift: $\mathrm{Re}(\Delta E_n)$ gives the real energy level shift and the imaginary part: $-2\,\mathrm{Im}(\Delta E_n) = \Gamma_n$ gives the decay width ($\Gamma_n=1/\tau_n$).
There is a connection between $\pi^+\pi^{--}$ or πK bound states and their asymptotical counterpart of free particle scattering at zero energy [2.3.16.8]. The $\pi^+\pi^{--}$ or πK scattering are evaluated by *scattering amplitudes*, which at low energies are usually expressed in terms of *scattering lengths*. They can be tested experimentally by measuring the lifetime (decay width) and energy level shifts for the $\pi^+\pi^-$ and πK hadronic atoms, directly connected with the s-wave scattering lengths [2.3.16.9].

The main contributions and responsabilities of the Romanian group

a) Study of shower development and particle discrimination for the DIRAC experiment.
b) Monte Carlo simulation of the new PSh Detector.
c) Design, construction and operation of the Preshower Detector along with DIRAC setup.
d) Determination of the PSh Detector characteristics and performances.
e) Design of experimental works with the PSh Detector in the DIRAC – CERN framework
f) Processing and analysis of the PSh signal distributions (electron and pion spectra).
g) Participation in acquisition, analysis and interpretation of the experimental data
h) Elaborate scientific papers on construction and use of PSh and on testing nonperturbative QCD.

<u>**The future challenges:**</u> **Observation of the long-lived $\pi^+\pi^-$ atom and energy level shifts measurement.**
In *p-Be* interaction $\pi^+\pi^-$ atoms in *ns* states are produced. Interacting with Be-atoms they will be excited (**Fig. 4**). The main 2*p*-state decay is a $2p \rightarrow 1s$ transition with a subsequent decay of 1*s*-state into $\pi^0\,\pi^0$. The lifetime of the $\pi^+\pi^-$ hadronic atom in the 2*p*-state is determined by its energy level. The $N_A^l(Be)$ excited $\pi^+\,\pi^-$ atoms will fly and breakup into the *Pt* foil (1-2μm), providing an additional number of atomic pairs n_A^l (see **Fig. 4**). The separation of atomic pairs produced in the *Be* target n_A^{Be} and in the *Pt* foil n_A^l is done by a magnetic field. The lifetime measurement of the excited $\pi^+\,\pi^-$ atom states is done similarly to that for the ground state.

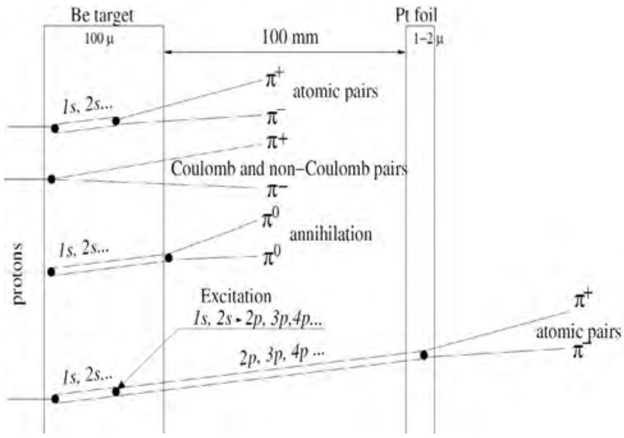


Figure 4. Method for observing the long-lived (metastable) $\pi^+\pi^-$ atoms

2.3.15.3. Atomic interaction studies

During 2007-2011, the excitation of the X-rays in ion - atom collisions has been studied. Many measurements of different light and heavy-ions, in the range of MeV/u energies of the Tandem accelerator, like ^{12}C, ^{16}O, ^{32}S, ^{48}Ti, ^{56}Fe, and ^{59}Co on Pt and other targets, have been conducted. Their goal was to test theoretical approaches of inner (K and L) shell vacancy production and sharing, as well as to build a database of inner shell ionization cross sections for applications, like particle induced X-ray emission (PIXE).

X-ray spectra induced by collisions of heavy ions with any kind of targets show, apart from the characteristic lines of projectile and target, a number of continuum x-rays: bremsstrahlung, molecular-orbital x-rays and radiative electron capture (REC). REC may serve to obtain information on the projectile electron binding energies inside the target, as well as about its inverse, the photoelectric effect. During 2007-2011, studies of REC in 0.5-2.5 MeV/u ^{32}S and ^{35}Cl on thin Cu targets at Tandem accelerator have been performed.

Results of these studies have been reported and partially published [2.3.16.10].

In the frame of Stored Particles Atomic Physics Research Collaboration (SPARC, FAIR), in collaboration with GSI, Darmstadt, a study of diamond detectors for heavy ions, in order to build a new type of particle detector with significant radiation hardness properties, began. Starting in 2006 until the end of 2008 diamond sensors of different characteristics (thickness, producer, metallization) were tested at GSI LINAC and SIS accelerators at MeV and GeV regimes with heavy ions (Xe, U, Pb). The main investigated feature was the charge collection efficiency and its dependence of material and irradiation parameters [2.3.16.11].

2.3.15.4. Non-conventional methods for improving the production of highly charged ions by ECRIS

The main goal of the FP6 Project ISIBHI and PF7 Programme ENSAR - Project ARIS is the significant improvement of performances of the large accelerators facilities in Europe for nuclear physics, in terms of variety of the delivered beam, its energy, intensity and stability.

The best possibility to fulfill this charge is the use of ECR ion sources, which deliver high intensities of high charge state (q) ions of a large variety of ions, taking into acount that the energy is proportional with q^2 for the cyclic accelerators and with q for the linear or sincrotron accelerator facilities.

In this context the necessity for a better knowledge of the physical processes that occur in the ECR plasma and especially of the ionization processes is very important. Our ECR team was involved with significant contribution in clarifying some basic physical processes, with direct impact on enhancement of production of highly charged ions. This activity of R&D was presented at many international conferences in the field and in published papers [2.3.16.12 - 2.3.16.17].

References

2.3.16.1. B.Adeva,..., M.Pentia, et al., Phys.Lett. B 704: p.24-29 (2011)
2.3.16.2. B.Adeva, ..., M.Pentia, et al., Phys.Lett.B674:11 (2009)
2.3.16.3. M.Pentia, et al., Nucl.Instrum.Methods A 603:309-318,(2009)
2.3.16.4. B.Adeva, ..., M.Pentia, et al., Phys.Lett. B 619 (1-2): p.50-60 (2005).
2.3.16.5. B.Adeva, ..., M.Pentia, et al., Nucl. Instrum. Methods A 515 (3): p.467-496 (2003).
2.3.16.6. DIRAC Collaboration, CERN-SPSLC-2011-001 SPSLC-P-284-ADD. 5 February 9, 2011. 22pp. DIRAC Collaboration, CERN-SPSC-2011-013 ; SPSC-SR-081 (2011)
2.3.16.7. H. Leutwyler, IAP Conf. Proc. N.272 (AIP New York 1993), 185.
G.Ecker, „Chiral perturbation theory” in “Quantitative Particle Physics”: Cargese 1992, Eds. M.Levy et al., Plenum Publ. Co. (New York, 1993),
2.3.16.8. J.Gasser, V.E.Lyubovitskij, A.Rusetsky., Phys.Rep. 456 (2008) 167.
2.3.16.9. J.Schweizer, Phys.Lett.B587:33-40 (2004)
2.3.16.10. M.M.Gugiu, C.Ciortea, D.E.Dumitriu, D.Fluerasu, A.Enulescu, I.Piticu, A.C.Scafes, and M.D.Pena, Rom. J. Phys. 56, N.1-2, 71 (2011)
2.3.16.11. D.Fluerasu, A.Braeuning-Demian, and D.E.Dumitriu, Rom. J. Phys. 56, N.1-2, 80, (2011)
2.3.16.12. K. E. Stiebing, L. Schachter, and S. Dobrescu, Rev. Sci. Instrum., 81, N 2, 2010
2.3.16.13. L.Schachter, K.E.Stiebing, and S.Dobrescu, Rev. Sci. Instrum. 81, N 2, 2010.
2.3.16.14. L.Schachter, K.E.Stiebing, and S.Dobrescu, Rev. Sci. Instrum. 80, N 1, 2009.
2.3.16.15. L.Schachter, S.Dobrescu, K.E.Stiebing, TThuillier, T.Lamy, Rev.Sci.Instrum. 79, N.2, 2008.
2.3.16.16. G. Ciavola, S. Gammino, S. Barbarino, L. Schachter, S. Dobrescu, K. Stiebing, Rev. Sci. Instrum. 79, N 2, 2008.
2.3.16.17. G. Ciavola, S. Gammino, L. Celona, L.Schachter, and S. Dobrescu, High Energy Physics and Nuclear Physics, 31(S1) (2007) 13-17.

2.3.16. E-16: Nuclear Structure and Dynamics - Activity Report (2007-2011)

2.3.16.1. Introduction

The effort of the theoretical nuclear physics community is focused on providing nuclear physics infrastructures with modern theoretical tools. Such tools allow describing in a unified and comprehensive way the results of experiments conducted at the infrastructures. Making full use of the sophisticated experimental tools at the infrastructures requires concerted theoretical effort towards constructing reliable approaches and obtaining robust predictions. Our projects fit nicely into this development and attack a front-end subject of research, the structure and dynamics of exotic medium mass nuclei. A reliable description of those nuclei is not only improving our knowledge of the nuclear many-body problem considerably but also provides support and guidance for experiments at the new radioactive beam facilities. Especially SPIRAL2 at GANIL, France, NUSTAR at FAIR/GSI, Germany, FRIB at MSU, USA, and RIKEN in Japan offer the possibility to investigate nuclei under extreme conditions of isospin, spin and temperature. The new experimental data are expected to allow a better understanding of the nature of the in-medium nucleon-nucleon interaction, to test the validity of different theoretical approximations, to guide us towards integrating nuclear structure with nuclear reaction theories, and, last but not least, to lead us into new, unexplored regions of the nuclear chart. The understanding of the properties of exotic nuclei is also essential for nuclear astrophysics. The characteristics of nuclei close to the drip lines have relevance for nucleosynthesis and significance for the astrophysical simulations concerning the rp-process and the r-process path.

2.3.16.2. Scientific context and motivation, achievements

The exploration of nuclei in yet unknown regions far off stability reveal combinations of neutron and proton orbitals at the Fermi surface rather different from those accessible before, which may lead to considerable modifications of the traditional nuclear shell structure and to rather exotic nuclear shapes. Extreme N/Z ratios near the proton drip line offer new insights into the isospin structure of nuclei and medium mass A~70 nuclei with almost equal proton and neutron number provide some laboratory to study the effects of proton-neutron pairing correlations. The increased interest for the investigation of the neutron-rich nuclei in the A~100 region is determined by the drastic changes in structure with the evolution of the number of nucleons, which require beyond mean field approaches and realistic effective interactions in large model spaces. These nuclei are relevant for the rapid neutron-capture astrophysical process.
Our investigations are based on the Vampir-Monster models representing approaches to the configuration-mixing shell model trying to extract the relevant degrees of freedom directly from the nuclear Hamiltonian by variational procedures. In the last years we successfully investigated the structure of nuclei in the A~70 mass region. The results revealed that shape coexistence and shape transition phenomena dominate the structure of the nuclei in this region [1-7]. We addressed essential questions concerning the structure and dynamics of exotic nuclei and tests of fundamental interactions and symmetries based on variational approaches with symmetry projection before variation of the Vampir-Monster model family. Large model spaces and realistic effective interactions are used. The considered nuclei display a rich variety of bands being based on differently deformed prolate as well as oblate intrinsic structures coexisting in the same nucleus and in many cases even strongly mixing with each other. This coexistence of bands being built on rather different intrinsic shapes as well as the mixing of these bands causing rather complex decay patterns was predicted by the calculations and, in many cases, also confirmed experimentally [5-7].
Proton drip line and N~Z nuclei in the A~70 mass region have been investigated within the Vampir models as they are the micro-laboratory for high-precision tests of the Standard Model

providing sensitive tests of the conserved vector current (CVC) hypothesis and the unitarity of the Cabibbo-Kobayashi-Maskawa (CKM) matrix [3].
The isospin symmetry breaking is also responsible for the mirror energy differences, but the anomalies experimentally identified in the A~70 mass region are connected with shape coexistence and mixing as it was demonstrated in the frame of the complex Excited Vampir approach [5].
Extensive successful investigations included the self-consistent description of the Gamow-Teller strengths for the astrophysical rp-process waiting point nuclei in the A~70 region [1,2,4,6]. The Gamow-Teller strength distributions for the beta decay of the ground state as well as the lowest excited states of waiting point nuclei have been obtained within the complex Excited Vampir variational approach using different realistic effective interactions and different model spaces. The influence of the shape mixing accounted by the different effective interactions and model spaces used and comparison with the available data have been presented. The influence of the decay of the lowest excited states of the parent nuclei in the astrophysical environment of X-ray bursts was discussed and possible astrophysical scenarios presented for the first time in the literature.

2.3.16.3. Ongoing investigations on self-consistent description of structure and dynamics of exotic nuclei

The study of the structure and dynamics of exotic nuclei both theoretically and experimentally is nowadays one of the most active fields of research in nuclear physics. The nuclei with unusual N/Z ratios are proper candidates to get insight into the fundamental interactions and symmetries. These nuclei have relevance for nucleosynthesis and significance for astrophysical scenarios concerning the rp-process and the r-process path. The proton-rich nuclei in the A~70 mass region and the neutron-rich nuclei in the A~100 region manifest shape coexistence and mixing. A self-consistent description of their structure and decay requires theoretical methods going beyond the mean field approaches as well as realistic effective interactions and large model spaces. Within our projects microscopic many-body approaches belonging to the Vampir-Monster model family are used to address essential questions concerning the structure and dynamics of exotic nuclei and tests of fundamental interactions and symmetries. An essential step on the way to achieve a realistic description of exotic nuclei is the systematic derivation of suitable effective nucleon-nucleon interactions for particular mass regions and their extrapolations to proton- and neutron-drip lines. These investigations are important for the science program at the existing and future Radioactive Isotope Beams facilities, such us SPIRAL2 at GANIL, NUSTAR at FAIR/GSI, FRIB at MSU, RIKEN in Japan.

References

2.3.17.1 A. Petrovici, K.W. Schmid, O. Radu, A. Faessler, Nucl. Phys. A 799 (2008) 94.
2.3.17.2 A. Petrovici, K.W. Schmid, O. Radu, A. Faessler, Phys. Rev. C 78 (2008) 044315.
2.3.17.3 A. Petrovici, K.W. Schmid, O. Radu, A. Faessler, Phys. Rev. C 78 (2008) 064311.
2.3.17.4 A. Petrovici, K.W. Schmid, O. Andrei, A. Faessler, Phys. Rev. C 80 (2009) 044319.
2.3.17.5 A. Petrovici, J. Phys. G: Nucl. Part. Phys. 37 (2010) 064036.
2.3.17.6 A. Petrovici, K.W. Schmid, A. Faessler, Prog. Part. Nucl. Phys. 66 (2011) 287.
2.3.17.7 A. Petrovici, K.W. Schmid, A. Faessler, J. Phys.: Conf. Series 312 (2011) 092051.

2.3.17. E-17: Physics of Strongly Interacting Matter
Activity Report(2007-2011)

2.3.17.1 Introduction

In the last decades, detailed experimental results based on versatile experimental devices at various colliding energies, from pp (ppbar) to heavy ion collisions, led to a tremendous progress in the understanding of the main mechanisms of collision processes and the properties of the new form of matter produced in such collisions, based on strongly interacting constituents, starting from nuclear state at zero temperature all the way to a deconfined matter of quarks and gluons. Based on a joint effort of theory and experiment, the phenomenology of the different regions of the phase diagram of strongly interacting matter started to be coherently interpreted and reveals first signatures of a phase transition from a quantum liquid to a hadron gas at intermediate energies and from hadronic matter to a deconfined matter of quarks and gluons at ultra-relativistic energies. As far as the new states of matter are obtained in laboratory using heavy ion collisions, it is mandatory to have under control the influence of the finite size and dynamical aspects on the measured observables i. e. the dynamical evolution of the transient piece of matter produced in heavy ion collisions characterized by collective pattern. The strong coupling allows for effective multiple interactions of particles even in small systems and on very short time scales, which makes collective behaviour an important characteristic of medium- and high-energy nuclear reactions. On the “macroscopic” level the properties of an interaction are reflected by the equation of state of the produced matter.

Understanding baryonic matter at high energy density constitutes a formidable challenge for strong interaction theory. At very high temperatures, a transition to a system of free and massless quarks and gluons, coined as quark-gluon plasma (QGP), is expected. This state of matter should have existed in the very early universe, a few µs after the Big Bang, when temperatures were extremely high. The QGP phase transition is probably the only phase transition of the early universe that can be studied experimentally. The QGP should also exist in the core of dense neutron stars, where the net baryon density is very high. Detailed information on the corresponding equation of state would help understanding the behaviour of these astrophysical objects. The investigation of the phases of strongly interacting matter addresses some of the most important open questions of fundamental physics today. These include: What are the fundamental properties of matter interacting via the strong interaction as a function of temperature and density?; What are the microscopic mechanisms responsible for the properties of high density strongly interacting matter?; How do hadrons acquire mass?; How is mass modified by the medium it moves in?; What is the structure of nuclei when observed at the smallest scales, i.e. with the highest resolution?.

We are now on the verge of a significant new revolution in the field, owing to the recent and future availability of very high energy nuclear beams at the LHC (at CERN) and very high intensity beams at FAIR (at GSI), respectively. These two central facilities, which are at the forefront of the European research arena, will pave the way to the exploration of completely unexplored regimes of the strong interaction.

2.3.17.2 Present status of experimental research, theoretical understanding, and future challenges

Strong evidence for collective expansion in heavy ion collisions is derived from the observation of the anisotropy in particle momentum distributions correlated with the reaction plane. One of the most striking manifestations of collective phenomena is the so-called elliptic flow, evidenced in mid-central heavy ion collisions. The elliptic flow is characterized by the second Fourier coefficient (v_2) of the azimuthal momentum-space anisotropy. We performed detailed analysis of the collective expansion azimuthal distributions at mid-rapidity, different impact parameters and incident energies at SIS energies within FOPI Collaboration. The main results consisted of: experimental evidence and theoretical interpretation of collective expansion of nuclear matter produced in highly central collisions of heavy ions at intermediate and relativistic energies [18.1]; evidence of transition energy and its multi-dimentional studies [18.2]; experimental and theoretical study of azimuthal distribution of collective expansion in mid-central heavy ion collisions and their implication in extracting information on the dynamics of expansion process and on the EoS [18.3]. The calculations with the soft EoS reproduce the overall trends of the experiment. These results support the conclusion that the equation of state of baryonic matter at densities of about two times normal density ($2\rho_0$) and temperatures of about 50-70 MeV is soft. Hadron spectra provide complementary information on the medium evolution. The shape of the spectra of most hadrons at low transverse momentum is consistent with thermal emission of a collectively expanding source. While the shape alone does not demand a thermal description, the evidence from elliptic flow and the consistency with the hadron abundances make an interpretation of spectra in terms of models inspired by hydrodynamics meaningful. The particle yield as a function of transverse momentum reveals the properties of the system at the kinetic freeze-out, where interactions of hadrons cease. In the simplified version of such models, hadron spectra can be effectively characterized by two parameters: the kinetic freeze-out temperature Tkin and the average transverse flow velocity vt. A detailed analysis of particle spectra in heavy ion collisions has shown that at a given collision energy there is a common set of parameters (T_{kin},v_t), which describe measured low-momentum spectra of most hadrons simultaneously. The parameters indicate collective radial expansion, which increases with the collision energy. Deviations from this behaviour, which are observed for particular hadron species at some collision energies, can be explained by e.g. smaller hadronic cross sections or in-medium modifications. One of the goals of future heavy-ion collision experiments at relativistic beam energies is the precise scanning of the QCD phase diagram in the region of high net-baryon densities.

Such experiments address fundamental physics questions: What are the properties of very dense nuclear matter? Is there a first order phase transition between hadronic and partonic matter? Is there a critical or a triple point, and, if so, where are these points located? Is there a chiral phase transition, and, if so, does it coincides with the deconfinement phase transition? Are there new QCD phases? Based on the experimental and theoretical results at lower incident energies, at higher centre-of-mass energy in proton-proton and nucleus-nucleus collisions, the initial phase of the the matter produced is expected to be denser, to equilibrate faster and at a higher initial temperature, characterized by a larger volume of space-time. All these are premises for development of collective phenomena and therefore a tool to study macroscopic properties of hot and dense QCD matter. Detailed studies of p + p and heavy ion collisions at the LHC will facilitate a detailed characterization of QCD matter at high-temperature phase. Calculations of lattice-regularised QCD provide indications that characteristic properties of the QCD high-temperature phase, such as its interaction or its bulk viscosity, undergo qualitative changes if the temperature is raised well above the QGP transition. These changes are regarded as signals of the onset of a transition of the quark gluon plasma to more and more gas-like properties at higher temperatures.

ALICE experiment at LHC is well set to constrain our understanding of QCD thermodynamics and transport theory in the QCD high temperature phase. Within the LHC baseline programme of p+p and Pb+Pb collisions, this includes the measurement of abundances, spectra and collective flow in terms of their dependence on particle species, transverse momentum, rapidity, collision centrality, etc. It is necessary to better constrain the initial conditions of the collective phenomena, since they are currently a major source of uncertainty in determining properties of hot matter. The dependence of collective flow on the centre-of-mass energy of the collision allows to scan the dependence of properties of matter on the initial temperature and density attained in the collision.

2.3.17.3 Results

- Studies of the collective expansion in ultra-relativistic heavy ion collisions based on hydrodynamical inspired models coupled with non-extensive statistical equilibrium [18.4].
- Contribution to the ALICE experimental set-up, ALICE-GRID, TRD calibration, first experiments and first physics using p + p and Pb+Pb collisions [18.5]
- The team, deeply involved in realization of 24% of the ALICE-TRD chambers in our Hadron Physics Department, contributed to the mounting of the TRD detector (Fig. 18.1) in the ALICE experiment.
- The team contributed to seting up NIHAM Data Center, which was continously maintained as one of the most efficient sites of ALICE GRID (Fig. 18.2).

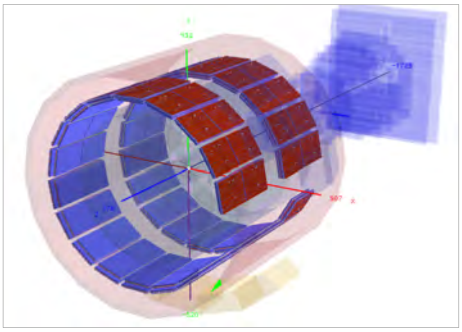


Figure 18.1

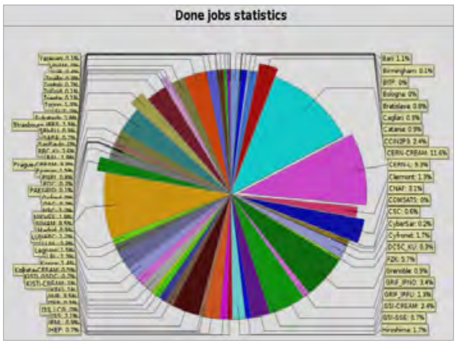


Figure 18.2

References

18.1. FOPI Collaboration, Phys. Rev. Lett.**25**(1995)5001

18.2. FOPI Collaboration, Nuclear Physics **A679**(2001)765

18.3. M. Petrovici, Fizika **12B**(2003)165;
FOPI Collaboration, Phys. Rev. Lett. **92**(2004) 072303

18.4. M. Petrovici and A. Pop AIP Conf. Proc. **972**, p.98 (2008);
M. Petrovici and A. Pop arXiv:0904.3666v1[nucl-ex](2009)

18.5. ALICE Collaboration, 2008 JINST **3** S08002; Eur. Phys. J. **C65**(2010)111;
Phys. Rev. Lett. **105**(2010)252301; **105**(2010)252302; **106**(2011)032301.

2.3.18. E-18: New detection and identification methods and Associated Front-End Electronics - Activity Report (2007-2011)

2.3.18.1. Introduction

Forefront experiments in nuclear physics in general require innovative instrumentation. Therefore, better performing accelerators, detectors, data acquisition and the associated highly sophisticated electronics are of continuous demand.

Next generation particle detectors have to be operated at extremely high counting rates and track densities. At the same time, these detectors have to provide excellent time and position resolution, as well as a low material budget to reduce multiple scattering and background. Evolving detector technologies with a rich R&D program include advanced diamond detectors, frontier photon detectors based on nanotechnology, inorganic scintillation fibers, or on silicon photo multipliers, large-area low-mass gas counters, fast compact Cherenkov counters for particle identification, ultra-light and large-area tracking systems based on GEM or Micromegas technology, ultra-light tracking and high-resolution vertex detection systems based on silicon sensors. The future CBM experiment at FAIR will be confronted with the selection of rare probes in high multiplicity environment at collision rates of up to 10^7 events/sec. Therefore fast, large granularity and radiation hard detectors for electron as well as hadron identification, high resolution secondary vertex determination and a high speed event-selection and data acquisition system have to be developed. The ongoing R&D activities along these lines have to be continued in order to exploit the high intensity beams envisaged at the future FAIR facility by the CBM experiment.

At the same time, the ALICE upgrade program will enhance the present discovery potential and make use of the high luminosity of LHC. Recent developments in integrated circuits technology and advances in computing and networking power significantly improved the performance of all experiments in nuclear physics. Field-programmable gate arrays, including more than one million logic gates, are used in fast trigger- , pattern recognition-, real-time tracking and position-determination circuits and event builders. Upgrades of present experimental devices and design of future ones will take advantage of these developments and advances in fast digitizers. Optical fiber and transceiver performance, with transfer rates of 5–10 Gbits/s/link is now available off-the-shelf. Therefore, event building and recording rates of up to 1 Gbytes/s is at reach.

2.3.18.2. Present status of R&D research

A very important part of the activities that take place in the Detector Laboratory of Hadron Physics Department is represented by R&D activities for new type of detectors and the associated front-end electronics.

The members of this team designed and built High Counting Rate TRDs which conserve their performance in terms of electron-pion rejection and position resolution at counting rates up to 250 kHz. Taking this into consideration, the architecture of TRD prototypes developed by us is a serious candidate to be implemented in the CBM experiment at FAIR, GSI-Darmstadt.

At the same time, we developed high counting rate and high granularity Resistive Plate Counters (RPC) with time resolution better than 50 ps and two dimension position information based on low resistivity glass electrodes and strip architecture proposed and realized by us. New, multistrip, multigap, symmetric RPC architecture was proposed and developed by our group [19.1,19.2]. The TOF-RPC array of FOPI was realized based on such geometry [19.3].

Members of our team were also involved in developing a start detector from a single crystal **C**hemical **V**apor **D**eposition **D**iamond **D**etector (**CVD-DD**) with a time resolution better than 100 ps and a large efficiency for minimum ionizing particles.

The actual performance of any detector is very closely connected with the performance of the associated front-end electronics. That is why it is a good strategy to have a very strong collaboration between the people designing and building the detector and the people designing the front-end electronics. This allows extensive tests and adjustments to be done in all the phases of the design. Our group has been following this strategy for a long time: a member of our group had an essential contribution in designing the analogical part (Preamplifier Shaper - PASA) of the ALICE TRD "multichip module" (MCM). This Preamplifier Shaper is designed and build in the ASIC using CMOS 0.35 ❍m technology.

We have acquired and installed the CADENCE environment, used for designing ASIC microcircuits necessary for the front-end electronics associated with radiation detectors. The OrCAD environment, used for designing Printed Circuit Boards (PCB) is also available in the HPD. Using these high performance tools, front-end electronics chips are continuously designed and tested in our group.

We are proud to mention that in our team was designed the first analogic CHIP in Romania, it was implemented on a mother board designed also by members of our group and successfully used in testing the TRD prototypes mentioned above.

2.3.18.3. Results

- Contribution to the ALICE experimental set-up by using the Detector Laboratory in Hadron Phys ics Department (Fig. 19.1).
- Proposed and realized new RPC architectures with strip read-out electrodes based on which future TOF experimental devices will be realized (CBM) .
- Proposed and realized new architectures of transition radiation detectors with high efficiency and electron/pion rejection factor better than 1% for high counting rates [19.4].
- Tests of the various types of detectors with radioactive sources and beams (Figs 19.2, 19.3).

Figure 19.1 Detector Laboratory of Hadron Physics Department

Figure 19.2 In-beam tests of the RPC prototypes

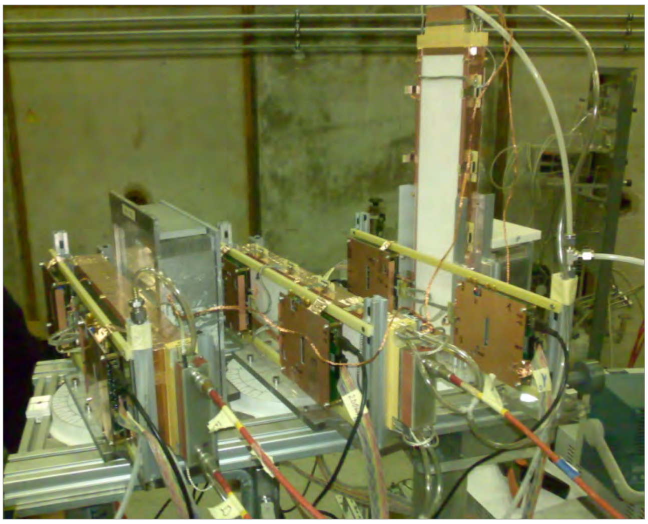


Figure 19.3 In-beam tests of the TRD prototypes and associated front-end electronics

References

19.1.Nucl.Instr. and Meth. **487A**(2002)337; Nucl. Instr. and Meth. **508A**(2003)75

19.2.VI Workshop on Resistive Plate Chambers and Related Detectors,
Coimbra, Portugal, 26-27 November, 2001

19.3.Compressed Baryonic Matter, May 13 - 16, GSI Darmstadt/Germany (2002)

19.4.Nucl. Instr. and Meth. **A579**(2007)961; Nucl. Instr. and Meth. **A585**(2008)83;
Rom. Journ. Phys. **55**(2010)324

2.3.19. E-19: ATLAS Experiment at the LHC - Activity Report (2007-2011)

2.3.19.1. Scientific context

Particle physics is a central component of the physical sciences, focused on the fundamental nature of matter and energy, and of space and time. Discoveries in this field, often called high-energy physics, will change our basic understanding of nature. Particle physics has been very successful in creating a major synthesis, the Standard Model (SM). The Standard Model of particle physics provides a remarkably accurate description of elementary particles and their interactions.

At successive generations of particle accelerators physicists have used high-energy collisions to discover many new particles. By studying these particles they have uncovered both new principles of nature and many unsuspected features of the universe, resulting in a detailed and comprehensive picture of the workings of the universe.

Revolutionary discoveries have shown that this Standard Model, while it represents a good approximation at the energies of existing accelerators, is incomplete. They strongly suggest that new physics discoveries beyond the Standard Model await us at the ultrahigh energies of the Terascale.

The Large Hadron Collider (LHC) will provide a first look at this uncharted territory of ultrahigh energy. The Large Hadron Collider accelerates beams of protons in opposite directions around giant circular rings at nearly the speed of light, producing millions of high-energy collisions per second. LHC experiments will address key questions about the physical nature of the universe: the origin of particle masses, the existence of new symmetries of nature, the existence of extra dimensions of space, and the nature of dark matter. LHC represents a unique opportunity to search for new particles predicted by models beyond the Standard Model (BSM). LHC may produce new particles and gain direct access to new phenomena of the Terascale.

2.3.19.2. ATLAS experiment overview

The ATLAS experiment is a general-purpose detector for the LHC, whose design was guided by the need to accommodate the wide spectrum of possible physics signatures. The major remit of the ATLAS experiment is the exploration of the TeV mass scale where groundbreaking discoveries are expected. In the focus is the investigation of the electroweak symmetry breaking and linked to this the search for the Higgs boson as well as the search for Physics beyond the Standard Model. The main goals of the ATLAS programme include precise measurements of the Standard Model parameters, but also search for new phenomena. The nucleus-nucleus collisions at the LHC energy will provide a useful opportunity to study the properties of strongly interacting matter at extreme energy density, including the possible phase transition to a colour deconfined state, the quark gluon plasma.

The discovery of Higgs boson has been used as a benchmark to establish the performance of the ATLAS detector. Until now, in the studies dedicated to the SM Higgs boson discovery, based on about $1fb^{-1}$ data recorded by ATLAS, no significant excess was found in the mass range of 110 – 600 GeV but the ATLAS experiment will continue with high priority the search for SM Higgs boson. By the end of 2012, a conclusive answer concerning the SM Higgs boson existence should be obtained.

The jet production in proton-proton collisions at 7 TeV, representing the dominant high transverse momentum process, is extensively studied by ATLAS. The most important result until now is the validation the of the perturbative QCD theory in the new kinematic regime open by LHC. Systematic studies of top quark production and properties as well as complex studies of B physics including comparison of the data with SM predictions are also important in the Atlas physics programme.

The search for new particles, superparteners of the already known particles is another important objective of the ATLAS physics programme. Supersymmetry, the only presently known mechanism for incorporating gravity in the quantum theory of particle interactions, postulates the existence of a high number of new particles, superparteners for all the presently observed particles. There are predictions about the bosonic superparteners of fermions - squarks and sleptons - and the fermionic superparteners of bosons gluinos and gauginos - and ATLAS will search them.

ATLAS is also searching for new quark and lepton families as well as for new heavy gauge bosons with masses much higher than the masses of W and Z bosons. LHC allows searching for signatures characterizing quark compositness, a fundamental question. New models propose the existence of extra dimensions leading to a characteristic energy scale of quantum gravity in the TeV region. Thus, there are predictions about the emission of gravitons which escape into extra dimensions generating high missing transverse energy or Kaluza-Klein excitations manifesting as Z-like resonances with ~ TeV separations in mass and ATLAS will search for them.

The ATLAS detector covers almost the entire solid angle around the nominal interaction point and comprises the following sub-components:

- An inner tracking system: operating inside an axial magnetic field of 2T, it is based on three types of tracking devices. These are an outer tracker using straw tubes with particle identification capabilities based on transition radiation (Transition Radiation Tracker, TRT), a silicon strip detector (SemiConductor Tracker, SCT) and an innermost silicon pixel detector.
- A hybrid calorimeter system: for the electromagnetic portion, the hadronic end-cap and the forward calorimeter a liquid argon technology with different types of absorber materials is used. The central hadronic calorimeter (Tile) is a sampling calorimeter with steel as the absorber material and scintillator as the active medium. The electromagnetic sections use an accordion geometry to ensure fast and uniform response. A presampler detector, to correct for energy losses in the upstream material, is installed in front of the EM calorimeter in the range $|\eta| < 1.8$
- A large muon spectrometer: an air-core toroid system generates an average field of 0.5 T (1 T), in the barrel (end-cap) region of this spectrometer, resulting in a bending power between 2.0 and 7.5 Tm. Over most of the η-range, tracks are measured by Monitored Drift Tubes; in the high-regime the closest of four wheels to the interaction region is instrumented with Cathode Strip Chambers. Trigger information is provided by Thin Gap Chambers in the end-cap and Resistive Plate Chambers in the barrel.
- Specialized detectors in the forward region: two dedicated forward detectors, the LUCID Cherenkov counter and the Zero Degree Calorimeter. In addition the BPTX, an electrostatic beam-pickup which monitors the timing of the beam near ATLAS and two scintillator wheels were mounted in front of the electromagnetic end-caps to provide trigger signals with minimum bias.

The Romanian group was involved in ATLAS well before the official signature, in 1998, of the MoU. The IFIN-HH physicists and engineers were involved in the project R&D-34 (construction of a prototype of iron-scintillator sampling calorimeter) and R&D-13 (dedicated to scalable Data Taking System). As a consequence, in the MoU for Construction of ATLAS Detector, the participation of the Romanian group is mentioned related to: a) the construction of Tile calorimeter (Tilecal) and b) development of the Trigger and Data Acquisition System (TDAQ). The construction of the support structure for the large barrel of Tilecal (64 support girders, 6 m long, and the link elements between modules) was the main Romanian contribution to the hardware construction of ATLAS detector. The construction of the girders and the link elements has been performed at Cluj. The engineers from ATLAS Romanian group were involved in the quality control of girders, module assembly, cabling, inserting of fibers inside modules, optical instrumentation, tests of the Front End electronics.

The ATLAS detector was thoroughly commissioned and initial calibration and performance studies were done using cosmic ray data recorded during 2008 and 2009. Performance close to design goals was obtained for the different detector components. The excellent performances of the LHC, mainly the rapidly increasing luminosity, and the high quality data obtained until now by the ATLAS detector allow us to continue accomplishing the Atlas Collaboration scientific programme.

2.3.19.3. Scientific and technical contribution of the research team

The physicists were involved in Tilecal test beam activities (data taking, calibration, offline analysis of data to determine the calorimeter performances) as well as in the Tilecal commissioning with cosmics and single LHC beams. After the LHC startup, a high priority was given to the Tilecal operation as well as to monitoring of calorimeter functionality and data quality. Software tools were developed for data quality monitoring and time evolutions of errors. The jet identification and the missing transverse energy reconstruction in simulated and experimental events were two directions of most interest and useful in the study of top anti-top pair production in p-p collisions at 7TeV. Another study was the jet energy calibration using the in-situ technique of the transverse momentum balance in photon-jet events produced in proton-proton collisions at $\sqrt{s}$ =7 TeV.

The Romanian TDAQ group contributed to the development of Online Software components (software to configure, control and monitor the TDAQ system), the TDAQ software releases management and testing and the development of a set of tools to evaluate the DAQ efficiency. The activity was related mainly to two Online Software components, the Message Reporting System and the Integrated Graphical User Interface. The contribution to the TDAQ software releases was related to the development of the policies and tools which are used by software developers and librarians in order to develop, release, deploy and maintain the TDAQ software. The Bucharest group contributed also to the release testing, as a remote test bed. After the data taking start, a set of tools for DAQ efficiency evaluation has been developed. The set includes applications to read from online databases information about the stable beams, active runs, data taking rates, dead time sources and also to display this information as web pages. The results obtained by a group of engineers from University Politechnica Bucharest in the TDAQ system are related to their participation and their contributions to the choice and deployment of the network management solution of the TDAQ system.

In this period we continued to develop the ATLAS Group Analysis Facility, composed of Tier2 Grid facility RO-02-NIPNE and our local batch/interactive computing cluster for simulations and data analysis. A new data centre infrastructure, housing our analysis facility, was developed and it is based on a 160kW UPS system and a chilled water topology cooling system. New network infrastructure was deployed based on an Unified Fabric Solution for data centres, handling LAN/SAN traffic of 10 Gigabit / 1 Gigabit Ethernet, iSCSI, Fibre Channel and Fibre Channel over Ethernet. As well our up-link connection was upgraded to 10 Gbit/s. RO-02-NIPNE Grid facility has a computing power of 400 CPU cores with more than 2 GB/core RAM and a storage capacity of 200 TB. The local computing cluster used for simulations and PROOF analysis is composed of 44 cores, 1 GB/core RAM, with a storage area of 7 TB. The main activities consisted of maintenance, operation and development of the Group Analysis Facility according to ATLAS Collaboration requirements.

Concerning ATLAS experiment upgrade, the participation of ATLAS Romanian group is mentioned in the following document: ’’TileCal phase II upgrade R&D proposal’’, related to tasks regarding the functionality, prototyping and testing of the phase II electronics, both on detector and off detector, including the required links.

Physics studies were mainly devoted to phenomenology and prospects for new phenomena discovery potential. An important component of our research was dedicated to comparative analysis between LHC data and the theoretical predictions based on Monte Carlo simulations. Study of jet production, general topological search for new physics, search for supersymmetry in single lepton and multi-lepton final states, search for charged heavy leptons production, search for excited quarks, Monte Carlo generators validation using $t\bar{t}$ data and phenomenological studies on particle production and decay were considered. Under the supervision of our ATLAS group senior scientists students were elaborating diplomas, Master dissertations and PhD thesis on many of the subjects mentioned before.

2.3.20. E-20: FCAL Activity Report (2007-2011)

2.3.20.1. Introduction

ILC (International Linear Collider [1]) and CLIC (Compact Linear Collider [2]) are two future projects of linear accelerators which will collide electrons and positrons. They will be able to complement the physics program of LHC by taking advantage of the cleaner background environment. LHC is a discovery machine; its main goal is to prove the existence of the last ingredient of the Standard model of particles, the Higgs boson, and to search for signals which may point to physics Beyond the Standard Model. If new signals are being discovered, there comes the need to know their properties, their way of interacting and where they come from. The scientific community has reached the agreement that an electron-positron collider with center of mass energies between 500 GeV and 3 TeV, coupled with very high luminosities, is the next best choice to fulfill the tasks outlined. Such a machine is either ILC or CLIC.

The two proposed future projects are currently being developed in parallel, although they are at different stages of development. In 2005 the ILC community has completed a baseline design for ILC and based on it a more detailed Reference Design Report, RDR, was published in 2007 including more technical aspects and a cost estimate. Presently the ILC is in the engineering design phase preparing to produce a Technical Design Report, TDR, which will be the final step towards the approval and eventual construction of this accelerator. In comparison, the CLIC research community is working on preparing the Conceptual Design Report, CDR, by the end of 2011.

2.3.20.2. Present status of experimental research, theoretical understanding, ...

As both accelerators are still at the proposal-phase level, tests are being assiduously conducted in order to establish the best technologies which are going to be pursued, the materials which are going to perform best in the given conditions and, not last, the cost effective choices. Prototypes of sub-detectors or sensitive materials and electronic devices are being tested in beam-test facilities to investigate performances and to develop new technologies, if needed, to withstand the extreme conditions of a powerful future linear collider.

The basic outline of the detectors proposed for the two accelerators is common as the CLIC community decided to have as starting point the detectors validated for ILC and then continue adapting and optimizing them for CLIC environment.

Four detector concepts were proposed in the ILC RDR. The need to extract the maximum information from ILC/CLIC events dictates a few design characteristics common to all detector concepts. All concepts make use of similar pixel vertex detectors, for high precision vertex reconstruction and serving as powerful tracking detectors, they all include sophisticated tracking systems, optimized for high track reconstruction efficiency and excellent momentum resolution. Also, all concepts are designed to accommodate the calorimeters inside a magnetic coil, since much of the physics relies on high quality calorimetry. High field solenoids, ranging between 3 and 5 Tesla, have been proposed, to ensure excellent momentum resolution and help disperse charged energy in the calorimeters. [3]

The initial four detector designs were SiD (Silicon Detector), LDC (Large Detector Concept), GLD and the 4'th Concept. LDC and GLD joint efforts and a new combined design emerged, the International Large Detector, ILD. Only ILD and SiD were approved to enter the new development stage and prepare the Detailed Baseline Designs (DBDs).

The great challenge of the ILC/CLIC detectors consists in improving measurements on observables determined through a large experimental program designed to explain the mass generation mechanism and electroweak symmetry breaking. For this purposes, new limits on jet energy resolution, momentum and vertex impact parameter have to be reached. Investigations regarding multi-jets and supersymmertry require highly hermetic detectors and large solid angle coverage. Particularly, *the vertex detector and very forward calorimetry must survive in a high background of e^+e^- pairs produced by the beamstrahlung radiation of the colliding beams*. *The high level of radiation and fast bunch crossings (once every 300 ns) pose great challenges over the design of the very forward detectors*. [4]

Three calorimeters are planned in the very forward region of a detector concept proposed for ILC and CLIC. BeamCal, adjacent to the beam pipe, LumiCal covering larger polar angles, are electromagnetic calorimeters and GamCal located at 100 m from the interaction point with the role of aiding beam tuning. There is also LHCAL, a hadron calorimeter covering almost the same polar range as LumiCal, which shields the inner detector, and a position monitor placed in front of BeamCal. Also, the last quadrupole magnet, QD0, of the Beam Delivery System (BDS) extends into the very forward region. Its role is to transport and de-magnify the beams in order to bring them into collision and then carry out the spent beams.[5]

Even so, prior to any prototyping, preliminary studies are needed in order to determine the energy scale of the phenomena involved, to better understand the physics phenomena at the tera-scale as well as to establish the conditions in which the detectors are required to perform in order to reach the proposed physics goals. All these tasks are performed through complex simulation software able to describe in great detail the detectors, the primary collisions, interactions of particles with the detector's materials and the response of the detectors.

2.3.20.3. Investigation of electromagnetic and neutron showers in BeamCal and QD0

One of our group's contributions consists in the optimization of the detector simulation algorithm. Two components have been investigated, BeamCal at ILC and QD0 at CLIC.

BeamCal must shield the Inner Detector against backscattering from beamstrahlung pairs while efficiently detecting single high energetic particles at lowest polar angles. The identification of high energy electrons at small polar angles is necessary to veto two photon events. The latter are a serious background in many new particle search channels and produce very high levels of ionizing dose in which the sensors used for BeamCal have to survive. On the other hand, the distribution of energy depositions coming from background allows for a fast determination of bunch parameters.

Consequently, the background electromagnetic shower shape has been investigated and the radiation levels have been estimated for one year of operation at ILC accelerator as well as bunch-by-bunch fluctuations of energy depositions.

The electromagnetic radiation dose and neutron fluxes have been estimated using two different simulation algorithms, a stand alone simulation of BeamCal, BeCaS, and the general software framework which describes the whole ILD detector concept, Mokka. It was found that the results given by the two detector simulation algorithms are comparable. With BeCaS, a radiation dose of ~0.5 MGy/yr is found in the ring of cells placed right around the beam pipe (~20 individual cells) and a maximum dose of $\sim 0.2\times10^6$ Gy/yr is estimated with Mokka for a single individual cell.

Also, radiation doses and neutron fluxes in BeamCal have been evaluated using different configurations of magnetic fields e.g. a simple 3.5 T solenoid field, a detailed 2D combination of solenoid and local dipole correction, anti-DID, etc. A factor 1.5 to 2 between energy depositions in simple solenoid magnetic field and 2D solenoid field map with anti-DID has been observed. A radiation dose of ~0.21 MGy/cell/yr for a 2D solenoid field map with anti-DID and ~0.42 MGy/cell/yr in simple solenoid magnetic field is determined.

In what concerns neutrons, almost 2 times more neutrons are produced in the simple solenoid magnetic field than in the solenoid corrected with the anti-DID and a neutron fluence of $\sim 2.6\times10^{11}$ n/mm^2/yr (FieldX03) and $\sim 4.6\times10^{11}$ n/mm^2/yr (SField01) is estimated. The results are in good agreement with the results obtained previously using the stand-alone BeCaS simulation algorithm for BeamCal. [6]

Results related to BeamCal simulation studies are published in two ISI journals, *J*INST 5 P12002 [7], 2010 and Rom. J. Phys , vol. 55, no. 7-8, (2010)687-707 [6], in the Proceedings of the 18th FCAL Collaboration Workshop, 2011, ISBN: 978-973-0-11117-0, pp 70-74 [8] and presented in many collaboration meetings and international workshops.

Background levels expected at CLIC represent one of the main issues to be considered for the design of the detectors proposed at this future linear collider. There are two main background sources, one due to interactions occurring in the beam (parallel muons produced in the beam halo or neutrons from the spent beam) and another due to beam-beam interactions such as e^+e^- pair production and hadron production in gamma-gamma processes. Beam dynamics near the interaction point also puts constraints on the detector design while the strength of the interaction between the beams and the solenoidal magnetic field of the detector limits the intensity of the magnetic field which can be used.

A detailed but simplified model of the final focus quadrupole magnet (QD0) was implemented in a Geant4 application, Mokka. With this model the electromagnetic and neutron doses in different components of QD0 were estimated.

It was found that the dose decreases rapidly in beam direction (away from the IP). The electromagnetic dose is highest in a part of the permanent magnet assembly, and is found to be less than 270 kGy/yr for the incoherent pairs. The dose induced by neutrons in the same region is less than 50 Gy/yr and the neutron flux is found to be up to 5×10^{12} neutrons/mm^2/yr.

The electromagnetic dose in the yoke and copper coils of QD0 is much smaller. The highest dose in the yoke is 20 kGy/yr in the parts closest to the outgoing beam-pipe, and much less further away from it. In the coil the maximum dose is about 3 kGy/yr.

The results related to QD0 studies are included in the CERN-LCD Note, LCD-2010-013: "*Radiation Dose to the QD0 Quadrupole in the CLIC Interaction Region*" [9] and presented at FCAL collaboration meetings, workshops or CERN summer school.

References

2.3.n.1. ILC accelerator homepage http://www.linearcollider.org/

2.3.n.2. CLIC accelerator homepage http://clic-study.org/

2.3.n.3. Behnke, Ties; Damerell, Chris; Jaros, John; Myamoto, Akya, *ILC Reference Design Report Volume 4 – Detectors*, eprint 2007arXiv:0712.2356B

2.3.n.4. Brau, James, Okada, Yasuhiro, Walker, Nicholas, *ILC Reference Design Report Volume 1 - Executive Summary*, eprint 2007arXiv0712.1950B

2.3.n.5. The ILD Concept Group, *The International Large Detector: Letter of Intent*, arXiv:1006.3396

2.3.n.6. C. Coca, W. Lohmann, M. Orlandea, A. Sapronov, E. Teodorescu, *Expected electromagnetic and neutron doses for the BeamCal at ILC*, Rom. J. Phys , vol 55, nos 7-8, (2010)687-707

2.3.n.7. FCAL collaboration, *R&D for Very Forward Calorimeters for ILC Detectors*, *J*INST 5 P12002, 2010

2.3.n.8. E. Teodorescu, *A look into the effect of supplementary magnetic fields on background levels in BeamCal at ILC*, Proceedings of the 18th FCAL Collaboration Workshop May 30 – June 1, 2011, Predeal, Romania, ISBN: 978-973-0-11117-0, pp 70-74

2.3.n.9. A.Sailer, E.Teodorescu, *Radiation Dose to the QD0 Quadrupole in the CLIC Interaction Region*, CERN-LCD Note, LCD-2010-013

2.3.21. E-21: Computational Physics & Information Technologies – CPIT (2007-2011)

The team conducts studies on numerical modeling and simulations of physical phenomena, algorithm developments, computing optimization, and the investigation of topics of current interest in physics. CPIT is one of the 11 strategic directions in physics research that were recently identified at the national level by the ESFRO project (http://www.ifa-mg.ro/esfro). Due to the interdisciplinary character of the field, the team involves specialists with different professional backgrounds, such as physicists, computer scientists, engineers in various specialties, and programmers. 107 ISI papers were published in the research areas presented below.

2.3.21.1. Mathematical modeling and numerical methods for physics

The mathematical modeling, the development of numerical methods, algorithms, and computer codes are steps toward the derivation of essential tools for the theoretical investigation of complex physical systems and the planning and realization of large-scale experimental projects. A number of remarkable results were derived along these lines in IFIN-HH. During 2007-2011, the team contributed to the development of new numerical methods and to the modeling of systems of current interest in condensed mater research, publishing 23 ISI papers and one book chapter.

New **piecewise analytical perturbation methods** were devised for solving linear or radial time-independent Schrödinger equation, with an efficiency gain of several orders of magnitude [2.3.23.1, 2]. In particular, the constant-based perturbation methods are particularly attractive, being directly suitable for parallelization and therefore recommended for large scale applications. The perturbative approach was further extended to the two-dimensional Schrödinger equation [2.3.23.3], the multidimensional case, which is the next target, being of current interest for ab-initio computations.

The consistent development of the **exponential fitting method** was pursued for a large class of approximation methods which require the use of a mixed reprezentation basis (power polynomial and trigonometric), in order to solve ordinary differential or integral equations [2.3.23.4]; also, a new efficient way for computation of the Airy functions was found [2.3.23.5].

A **Bayesian** approach to the **automatic adaptive quadrature** for the numerical evaluation of the observables which are expressed in terms of Riemann integrals has been developed [2.3.23.6]. A hierarchically ordered consistent set of well-conditioning criteria has been derived. This allowed integrand adapted mesh generations resulting in reliable and efficient solutions.

A noticeable aspect of the **modeling** activities concerned the development of numerically stable and mathematically self-consistent models on hard topics in condensed matter physics, such as the strongly correlated systems and nanostructures.

The rigorous solution of the GMFA equation of motion of the Green matrix of the **two-band Hubbard model** of the **high-Tc superconducting phase transitions** in cuprates allowed the proof of the spin-charge separation conjecture and evidenced the charge-charge nature of the exchange mechanism of the phase transition [2.3.23.7].

Numerical and quasi-analytical investigations of **trapped Bose-Einstein condensates** subject to time-modulated perturbations were performed in collaboration with the theoretical physics department and benefiting from the contacts with the Institute of Physics Belgrade in the framework of the FP7 HP-SEE project (http://www.hp-see.eu/) [2.3.23.8].

Ab-initio studies of the effect of intrinsic and extrinsic defects on the **charge transport properties in AlN nanowires** were conducted in collaboration with the R&D Centre for Materials, Electronic and Optoelectronic Devices at the Physics Faculty of the Bucharest University [2.3.23.9].

2.3.21.2. Grid computing

IFIN-HH hosts today the highest concentration of Grid resources in the country that provides the computing support for various national and international collaborations. The IT professionals of the CPIT team are experienced in Grid technology and distributed computing, participated during the reporting period in various national R&D projects on Grid technology, in the European EGEE and SEE-GRID projects, and collaborated with groups from EU, USA and JINR-Dubna.

Grid support for large-scale international collaborations

The CPIT team administrates, develops and operates the IT infrastructure necessary for the computing support of many international collaborations, of which the Worldwide LHC Grid Computing collaboration (WLCG) has a leading role, being built around the Grid that ensures the coherent storage and processing of data for the main LHC experiments. Since 2006, the CPIT team coordinates the Romanian Tier-2 Federation RO-LCG consortium composed of the five national institutions that contribute with 9 Grid centres to the support of the ALICE, ATLAS and LHCb experiments. According to the Grid accounting data published by the EGI portal (http://www3.egee.cesga.es), during the last 12 months the RO-LCG share covered 1,72 % of the total number of jobs processed by all the Tier-2 centres worldwide, ranking 11th out of 34 countries in the WLCG collaboration. During the same period, 47,5% of the national Grid production was provided by the Grid centre developed and operated by the CPIT team.

The CPIT team also developed the central monitoring and accounting system of the resources and services provided by RO-LCG.

Grid support for national scientific collaborations

Starting with 2010, the CPIT team has implemented the core of the National Grid for Physics and Related Domains (GriNFiC), with co-funding from the European Regional Development Fund, that is dedicated to the exclusive support of the national scientific collaborations (http://grid.ifin.ro). GriNFiC provides the access of the scientific community to services of parallel and distributed computing, data storage services, and software libraries, through its own virtual organization, gridifin, whose activity during the last 12 months represented more than 99% of the global activity of the national virtual organizations (http://www3.egee.cesga.es).

Quantum Encryption: The CPTI team designed and implemented the first quantum encrypted optical link in Romania. The team designed and provided quantum security protocols (BB84), proprietary RPC links (hopping-port socket technology, C++ class SXV4) and Advanced Encryption Standard proprietary code (C++ class AXV4) [2.3.23.10].

2.3.21.3. High performance computing

During the reported period, the CPIT team has built the high performance computing (HPC) infrastructure of IFIN-HH, which consists of parallel clusters in Gigabit Ethernet, Myrinet and Infiniband technologies. Two of these clusters (of 256 and 704 cores respectively), participate in international collaborations. The team has experience with HPC technologies, cluster architectures and cluster optimization, hybrid clusters, MPI over Grid implementation, and development of parallel applications. It collaborates with the Laboratory of Information Technologies (LIT) from JINR-Dubna, and leads the Romanian consortium that participates to the FP7-RI-261499 project *High-Performance Computing Infrastructure for South East Europe's Research Communities* (HP-SEE, 2010-2013), in the framework of which it coordinates the Computational Physics Virtual Research Community and the WP4 activity -Virtual Research Communities support.

Comparative studies on **assessment of the performance of multicore clusters**, relevant for cluster optimization, were performed in collaboration with LIT-JINR, Dubna. [2.3.23.11]

Modeling and simulation of complex systems

Contribution to the investigation of the generation, simulation, visualization and reconstruction of the **seismic events** in Vrancea region [2.3.23.12]

Computing environment and numerical simulations for the **investigation of complex biomolecular systems** on HPC clusters through standard parallel molecular dynamics (MD) codes, such as NAMD, with focus on the modeling of G Protein-Coupled Receptors were done. In particular, an integrated software platform for remote analysis of the results of parallel MD simulation of large biomolecular systems was recently developed by the team in the framework of the HP-SEE project (ISyMAB - *Integrated System for Modeling and data Analysis of complex Biomolecules*, http://wiki.hp-see.eu/index.php/ISyMAB).

2.3.21.4. Numerical algorithms and simulations for particle physics

The CPIT team participates in international collaborations built around large experimental facilities for particle physics built at the LHC CERN, takes active part in the modeling and simulation of the main features of the experimental installations, the Monte Carlo simulations of the expected results of new experiments, the processing of experimental data taking into account the new features of the detectors, the correlations effects induced by the interactions inside the detectors, and the possibilities of consistent parametrization of the expected interactions.

A measure of the 2007-2011 activity is given by the number of ISI publications co-authored by the members of the CPIT team in various experiments: ATLAS (58), LHCb (6), DIRAC (3), NA50 (3).

In addition to this, a special interest was dedicated to the following topics.

Design and application of **flash algorithms** for highly CPU-demanding data processing (needed due to the very high occupancies at high luminosity in the new generation particle physics experiments) and novel data reconstruction algorithms for data sifting [2.3.23.13].

Neutrino physics: Investigation of the properties of neutrinos by using large detectors. Study of neutrino interaction mechanisms with various media, using Monte Carlo event generators. Simulation of the response of underground detectors by means of Geant4.

Study of the muon-induced physical processes, which represent the background in the neutrino beam experiment, making use of the dedicated computer codes MUSIC (MUon SImulation Code) and MUSUN (MUon Simulation Underground) in connection with the FP7 LAGUNA project.

Neutron Noise Analysis for Reactor Safety: collaboration with the Frank Laboratoy (JINR-Dubna) on IBR-2 reactor data. Design of statistical information theory methods for the extraction of known reactivity modulatory influences from neutron noise spectra. Design of neural algorithms for characterisation of the sifted spectra in determining anomalous functioning regimes.

Neutron Detector design: simulations for the design of ^{6}Li solid state detectors. Macroscopic cross-section optimization for two technology options: MBE deposited LiF vs. sol-gel deposited Li_4SiO_4 (lithium nesosilicate).

References

2.3.23.1 **L. Gr. Ixaru**, Recent Advances in Computational and Applied Mathematics, Springer, 159 (2011)

2.3.23.2 **L. Gr. Ixaru**, Comput. Phys. Commun., **177**, 897-907 (2007), Phys. Rev. **A77**, 064102 (2008)

2.3.23.3 **L. Gr. Ixaru**, Comput. Phys. Commun., **181**, 1738-1742 (2010)

2.3.23.4 A. Cardone, **L. Gr. Ixaru**, B. Paternoster, Num. Algor. **55**, 467-480 (2010); R. D'Ambrosio, **L. Gr. Ixaru**, B. Paternoster, Comput. Phys. Commun., **182**, 322-329 (2011)

2.3.23.5 **L. Gr. Ixaru**, Comput. Phys. Commun., **176**, 637-641 (2007)

2.3.23.6 **Gh. Adam, S. Adam**, Physics of Particles and Nuclei Letters **5** (3), 269-273 (2008); Rom. J. Phys., **55** (5-6) 469-479 (2010); Rom. J. Phys., **55** (9-10), 887-902 (2010)

2.3.23.7 **Gh. Adam**, **S. Adam**, J. Phys. A: Math. Theor., **40**, 11205 (2007); J. Opt. Adv. Mat., **10** (7), 1666 (2008); Rom. J. Phys. **55** (5-6) 481-492 (2010)

2.3.23.8 A.I. Nicolin, **M.-C. Raportaru**, Physica A **389**, 4663 (2010)

2.3.23.9 **C. Visan** et al, Digest J. of Nanomaterials and Biostructures **6** (3), 1173 (2011); G. A. Nemnes, **C. Visan**, S. Antohe, Physica E, doi:10.1016/j.physe.2011.07.014

2.3.23.10 **M. Dima**, **M. Dulea**, A. Dima, M. Stoica, M. Udrea, Quantum Encrypted Data Transfers in GRID, chap. 5 in "Advances in GRID Computing", InTech, ISBN 978-953-307-301-9, (2011)

2.3.23.11 **Gh. Adam**, **S. Adam**, **M. Dulea**, **I. Vasile**, **C. Visan** et al, Rom. J. Phys **53** (5-6), 665 (2008); **Gh. Adam**, **S. Adam**, **M. Dulea**, **I. Vasile** et al, Rom. J. Phys **53** (9-10), 985 (2008)

2.3.23.12 M. Radulian, M. Popa M, **O. Carbunar**, et al., Acta Geod. Geophys. HU, **43** (2-3), 163, 2008; **O. Carbunar**, M. Radulian, J. Seismol., **15** (4), 579, 2011

2.3.23.13 A. Dima, **M. Dima**, Nuclear Instruments and Methods in Physics Research A606, 446 (2009); **M. Dima**, J. of High Energy Phys., Vol 2011, Issue 4, Article Number: 008, Published: APR 2011

2.3.22. E-22: LHCb Activity Report (2007-2011)

2.3.22.1. General view - CERN and the LHCb experiment

After a long preparation and commissioning period, LHC started to run at the end of 2009 passing smoothly from commissioning to delivering data at injection energy, and, shortly after in the first months of 2010, to colliding the beams at the largest collision energy reached so far in the world, 7 TeV. The luminosity has increased gradually since then and new physics results are continuously released. The smooth start-up of the LHC experiments is the result of years of work invested by the particle physics researchers to the detector design and construction, in trigger and software preparation, on the detailed feasibility studies for the physics analyses. The Romanian participation in the LHCb collaboration was initiated in 1996 and regulated later, by the MoU for the construction of the detector [2.3.24.1] and the MoU for maintenance and operation [2.3.24.2]. By the MoU LCG [2.3.24.3] additional obligations were assumed regarding the development, maintenance and exploitation of the local GRID clusters in the Tier 2 Romanian Federation. Given the long time involvement of a Romanian group in the LHCb experiment, it was a normal development that after contributing to the construction of the detector, the on-line software, and detector calibration the group will further contribute in years 2007-2011 to the calibration and commissioning of the detector, to service tasks and data taking, exploiting in parallel the physics potential of the LHCb experiment towards publishable physics results. The LHCb experiment at LHC is designed to look for New Physics (NP) through precise measurements of CP violation and rare decays in the beauty and charm sector. To exploit the large and kinematically correlated $b\,\bar{b}$ quark production in the forward region of pp interactions, the LHCb detector [2.3.24.4] is built as a forward single arm spectrometer with a maximum angular coverage of 10 to 300 mrad. The detector is operating with high efficiency from the first days. Adding to the 0.3 nb^{-1} at 0.9 TeV and 100 nb^{-1} at 2.76 TeV, 1 fb^{-1} of pp data were recorded at 7 TeV only in the year 2011. Twelve articles and sixty conference notes resulted from the LHCb data analysis so far. To put in evidence the NP, measurements of the highly suppressed rare decay branching ratios as $B_s \to \mu^+\mu^-$, the angular analysis of the $B^0 \to K^*\mu^+\mu^-$ decay and a study of the ratio of the branching fractions of the radiative B decays $B_d \to K^{*0}\gamma$ and $B_s \to \phi\gamma$ were performed. The measurements of ϕ_s through CP violation in $B_s \to J/\psi\phi$ and $B_s \to J/\psi f_0(980)$, and of the mixing y_{CP} and CP violation parameter A_Γ in the two body charm decays are only some of the other paths followed by LHCb in the quest for the NP. Also given the copious amount of the charm and beauty hadrons recorded by LHCb, studies of the production and the spectroscopy of the heavy quark hadrons are bound to provide interesting results. Good candidates for such kind of studies are the b-baryons, as they could not be produced at the b-factories and the measurements reported by the Tevatron experiments were based on very low statistics. The first measurements of the b-baryon lifetimes and masses were already published and more results will follow soon. Given its unique phase-space coverage among the LHC experiments, LHCb provides an essential input for the light particle production models in a region of phase space where different model predictions diverge when they are extrapolated not only in energy but also in (pseudo)rapidity. Other fields as electroweak physics and new particle searches are completing the very complex landscape of the LHCb physics, that will continue to be enriched in the years to come. R&D activities towards an LHCb upgrade are also taking place. A Letter of Intent for the LHCb Upgrade [2.3.24.5] was published this year. One aims towards an upgraded detector with a read out at 40 MHz and a much more flexible software-based trigger that will allow a large increase in data rate, trigger efficiencies and the number of physics channels that can be investigated.

2.3.22.3. LHCb – Ro contributions

The Romanian LHCb Team (LHCb-Ro) was involved along the years in the following tasks: design, construction, commissioning, cosmic ray tests and calibration of the calorimeter modules; development of software for calorimeter, computing, and online projects; design, upgrade and maintenance of the tool used for the shift organisation (ShiftDB); hardware and software upgrade and maintenance of the local GRID clusters; calibration of the RICH detector using data. We were also involved in the validation of the Monte Carlo (MC) simulation in 2008-2009 and 2011. During the 2008-2011, members of the Romanian LHCb team participated in data taking as data managers, and in 2011 we also contributed to data quality and production shifts. It is worth noticing that the period from 2007-2011 was a difficult one for the Romanian group in LHCb as the team structure and its programme undergone considerable changes due to the two successive changes of the team leader. From the beginning of 2011 the group has started under a new organization and programme.

Some of the physics studies pursued before 2011 followed two main directions: minimum bias physics (MB) that evolved from the studies for calibration of RICH sub-detector using $\Lambda \to \pi p$ and feasibility studies of algorithms for selecting various b-hadrons using kinematical and geometrical constraints. In year 2011, the physics effort of the group was increased and a further enriched physics program for the next four years has started. We implemented PYTHIA 6 tunes, checked the implementation of PYTHIA 8, improved the interface to the HEPMC and worked on RIVET integration, in the LHCb simulation framework. Specific RIVET subroutines were written to ensure that the LHCb MB results would be used for the validation and testing of the MC generators. Based on the contribution from one of us to the V^0 ratio paper [2.3.24.7], we are in the process of implementing selections for the multistrange baryons measurements. In the next years we will continue measuring the production cross-sections of strange particles and their ratios. We are also committed to continue the tuning of the MC generators using the LHCb data, and implementing and testing the new generators in the LHCb software framework. On the b-physics topics, work is going on to measure the Λ_b cross-section using the 2010 data. We hope for the release of this result before the end of the year. The study of the Λ_b differential cross-sections over the LHCb phase space will continue using the large 2011 data and those expected in 2012. Members of our group also contributed to the LHCb preliminary result on the radiative decays of the B mesons [2.3.24.8] and will follow this work until the publication. The way in which we can get involved in to the LHCb upgrade activities was also investigated. The Romanian group played visible roles in the LHCb collaboration. The team leader was acting during the 2011 as convener of the Hadronic Production and Spectroscopy working group of LHCb and represented LHCb in the LHC-Minimum Bias and Underlying Event working group. Well over ten talks were presented in the LHCb working groups in 2011. Two conference talks (one proceedings paper already published [2.3.24.9]) and one poster [2.3.24.10] were presented in conferences on behalf of LHCb in 2011, adding to the poster presented in 2008 [2.3.24.6]. We also contributed to the education of a new generation of physicists. Two physics Ph.D. theses will be completed in our group by the end of this year. Three members of our group participated as members of the organizing committee for "The European School of High-Energy Physics 2011", while two of our students participated to the school, presenting one poster. Two students were hosted this Summer: a CERN student that elaborated a $\Xi^{\pm}$ selection and a student in Bucharest that checked the 2.76 TeV data.

From 2007 the Romanian LHCb group is involved in the development and maintenance of a web application called ShiftDB, a web-based application to manage the LHCb personnel participating in the data taking. The first version [2.3.24.11] was put in production in the autumn of 2008 when the LHC accelerator started. Subsequent interactions with the users and the glitches discovered during the stress of running in real-life conditions have lead to a series of improvements during 2009. From 2009 we started the development of a new version of the Shift DB (2.0), introducing a simpler and user-friendlier interface taking into account user feedback, while we kept offering support for the older version. To deal with all the issues regarding the shift assignments, its capabilities were extended. Key parts of the project such as data redundancy, centralized mailing lists etc. were completely redesigned. The transition between the two variants of the tool took place gradually during 2011. LHCb jobs run in IFIN-HH on RO-07-nipne (the multipurpose IFIN-HH GRID cluster), RO-15-nipne (manpower only) and RO-11-nipne (dedicated LHCb-Ro cluster). Regular updates of middleware certificates, software updates and hardware upgrades at the cluster nodes were made. To improve the efficiency of our data analysis, we installed a user-interface that allows to build and to submit analysis jobs from RO-11-nipne.

Members of the LHCb-Ro participated also in the outreach activities by advertising the student programs of CERN and our physics program in the University of Bucharest. We contributed to the CERN Romania exhibition in Bucharest in Summer 2011 by producing a poster and providing guides. We also participated in radio broadcasts.

2.3.22.3. Project Impact

The LHC experiments at CERN are challenging our present knowledge on the surrounding world by testing the Standard Model (SM) of particle physics and searching for physics beyond the Standard Model. The physics topics followed by our group are particularly interesting. Given the complementary phase space coverage of the LHCb detector compared to the other LHC detectors, studies of light particle production are bound to provide a unique input to the hadronisation models. The interest for these studies goes beyond the mere particle production. A thorough knowledge of the basic properties of inelastic pp-collisions is crucial to understand the background in all New Physics searches at LHC. The study of the b-baryon production and of their properties, is an almost virgin ground of the b-physics field of research, promising a plethora of exciting results. The radiative decays of the B mesons offers a unique opportunity for putting in evidence new particles and phenomena. The posters and the talks presented to conferences, schools, working group meetings and the outreach activities increased the visibility of the Romanian particle physics community in CERN and in other research centers in Romania and abroad. Our involvement in the software tasks and the future involvement in the LHCb upgrade effort will result in transferable skills and advanced technological knowledge that can be applied not only in the particle physics experiments of the future but also in other areas of science and technology. Bringing master and Ph.D. students into the group, encouraging them to participate in Summer Schools, and to present their results at conferences, participating as supervisors to the CERN Summer Students programme, and establishing contacts with the University of Bucharest facilitate the education of a new generation of particle physicists, highly qualified and well integrated in the international environment.

References

2.3.24.1–2.3.24.3 LHCb-RRB-D-2000-24; CERN-RRB-2002-032; CERN-C-RRB-2005-01/Rev.
2.3.24.4 A.Augusto Alves et al., LHCb Collab., JINST 3, S08005 (2008).
2.3.24.5 LHCb Collab., CERN-LHCC-2011-001.
2.3.24.6 B. Popovici and S. Stoica, "MC free calibration of LHCb RICH detectors using the $\Lambda\rightarrow p\pi$ decay": "Physics at LHC", Split, Croatia, 2008.
2.3.24.7 R. Aaij et al., LHCb Collab., JHEP 1108 (2011) 034.
2.3.24.8 LHCb Collab., CERN-LHCb-CONF-2011-055, 2011.
2.3.24.9 -2.3.24.10 B. Popovici, on behalf of the LHCb Collaboration, Acta Phys. Pol. B 42 (2011) 1547-1556 .Cracow Epiphany Conference on the First Year of the LHC, Cracow, Poland, 10 - 12 Jan 2011 ; Eliza Teodorescu, « LHCb: Rare Decays at LHCb» , Poster-2011-181, presented at « Physics at LHC 2011 ».
2.3.24.11 "Personnel and Shift Database", The LHCb Commissioning group, EDMS 815412 (https://edms.cern.ch/file/815412/2/Personnel.pdf)

2.3.23. E-23: Exotic Atoms Activity Report

2.3.23.1. Introduction

An exotic atom is an atom in which the nucleus is made up of other particles besides protons and neutrons and the shell is made up of other particles besides electrons. Recent development of the particle accelerators has made the production and investigation of many exotic atoms (short-lived) possible. It is possible to make artificial atoms in which one or both of the atomic components of hydrogen, the proton and the electron, are replaced by their corresponding antiparticles. Example of such exotic atoms are: positronium, muonium and antihydrogen.

Particularly interesting for the study of nuclear forces is the physics of kaonic atoms. A kaonic atom is formed when a negative kaon enters an atomic target, for instance hydrogen or deuterium, looses its kinetic energy through ionization and excitation of the atoms and molecules of the medium and eventually is captured in an excited orbit, replacing an electron. Various collisional cascade processes and radiative transitions deexcite this kaonic atom to the ground state. When the kaon reaches low-n states with small angular momentum, it is absorbed through a strong interaction with the nucleus. This strong interaction causes a shift in the energies of the low lying levels from their purely electromagnetic values, while the finite lifetime of the state is evident in an increase in the observed level width.

The shift ε and the width Γ of the 1s state of kaonic hydrogen are related in a fairly model-independent way to the real and imaginary part of the complex s-wave scattering length, a_K-p:

$$\epsilon + \frac{i}{2}\Gamma = 2\alpha^3\mu^2 a_{K^-p} = \left(412eV\,fm^{-1}\right)\cdot a_{K^-p} \qquad (1)$$

(Deser-Trueman formula), where α is the fine structure constant and μ the reduced mass of the K^- p system. A similar relation applies to the case of kaonic deuterium and the corresponding scattering length, a_K-d:

$$\epsilon + \frac{i}{2}\Gamma = \left(601eV\,fm^{-1}\right)\cdot a_{K^-d} \qquad (2)$$

These simple relations are known to hold quite accurately for these atoms, their corrections being smaller than 1%. The higher order corrections tend to cancel between the two sides of each expression, and the Coulomb correction is quite small in these charge-one systems.

The observable scattering lengths a_K-p and a_K-d can be expressed in terms of the $\bar{K}$ N isospin dependent scattering lenghts a_0 (I = 0) and a_1 (I = 1). The kaonic hydrogen scattering lenght is simply the average of a_0 and a_0:

$$a_{K^-p} = \frac{1}{2}\left(a_0 + a_1\right) \qquad (3)$$

The kaonic deuterium scattering lenght is related to a_0 and a1 in the following way

$$a_{K^-d} = 2\left(\frac{m_N + m_K}{m_N + \frac{m_K}{2}}\right)a^{(0)} + C \qquad (4)$$

where

$$a^{(0)} = \frac{1}{2}\left(a_{K^-p} + a_{K^-n}\right) = \frac{1}{4}\left(3a_1 + a_0\right) \qquad (5)$$

coresponds to the (t-channel) isoscalar $\bar{K}$ N scattering length. The first term in equation (4) represent the lowest order impulse approximation - K^- scattering from each (free) nucleon. The second term, C, includes all high order contributions, representing all other physics associated with K^-d three-body interaction. The kinematic factor in the parentheses of equation (4) is due to the shift of the center of mass from the $\bar{K}$ N system to the $\bar{K}$ d system. Numerically, C is not negligible and, in fact, is larger than the first term.

The determination of the $\bar{K}$ N scattering length requires the calculation of C. A three body problem is solvable by the use of Faddeev equations when the two body interactions among them are specified. The K^-d three-body problem includes the further complication that the K^-p and K^-n interaction involve significant inelastic channels. The K^-p and K^-n scattering lengths are thus complex with large magnitude of the imaginary part, and so is the K^-d scattering length. Incorporating $\bar{K}N$ scattering data and its sub-threshold behavior, the two body potentials are determined in a formalism including both, elastic and inelastic channels. Three body Faddeev equation are then solved by the use of potentials, taking account of coupling among the multi-channeled interactions.

A measurement at the level of percent of kaonic hydrogen, together with the first measurement of kaonic deuterium will represent a dramatic step forward in the investigation of low-energy kaon-nucleon interactions.

2.3.23.2. Present status of experimental research

Three measurements of kaonic hydrogen X rays were carried out at CERN and RAL about 30 years ago[1, 2, 3], claming to observe a signal with positive energy shift and hence an attractive strong interaction between kaon and proton. This was in striking contradiction to results of low-energy scattering data extrapolated down to threshold, which showed a repulsive contribution of the strong interaction: the so-called "kaonic hydrogen puzzle" was born. The shift and width are deduced from the spectroscopy of the K-series kaonic-hydrogen x rays. The first distinct peaks of the kaonic-hydrogen x rays were observed by the KEK-PS E228 group [4] following the absorption of a stopped K within a gaseous hydrogen target using Si(Li) detectors. The observed repulsive shift was consistent with the analysis of the low energy $\bar{K}N$ scattering data, resolving the long-standing sign discrepancy generated by old experiments. Better values were reported by the DEAR experiment [5], in which the errors were reduced by a factor of 2 when compared with those of E228.

The most precise measurement of the K-series x rays of kaonic hydrogen atoms was performed by SIDDHARTA (Silicon Drift Detector for Hadronic Atom Research by Timing Application)[6] collaboration, using the microsecond timing and excellent energy resolution of large area silicon drift detectors (SDDs), at the DAΦNE electron-positron collider at the Laboratori Nazionali di Frascati of INFN. This was made possible by the use of new triggerable x-ray detectors, SDDs, developed in the framework of the SIDDHARTA project, which lead to a much improved energy and time resolution over the past experiments and much lower background in comparison with the DEAR experiment.

The 1s-level shift 1s and width 1s of kaonic hydrogen were determined to be:

$\varepsilon 1_s$ = -283 ± 36(stat) ± 6(syst) eV

$\Gamma 1_s$ = 541 ± 89(stat) ± 22(syst) eV

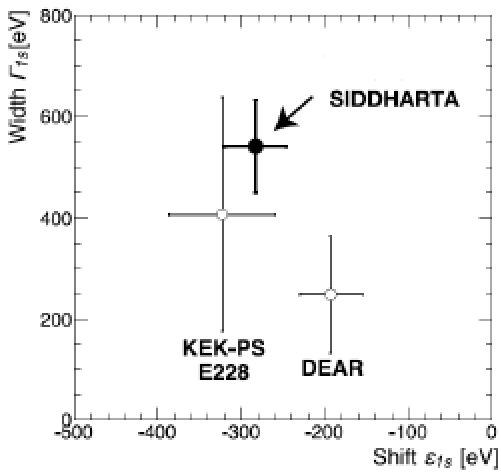


Figure 1: Comparison of experimental results for the strong-interaction 1s-energy-level shift and width of kaonic hydrogen, KEK-PS E228 [4], DEAR [5] and SIDDHARTA. The error bars correspond to quadratically added statistical and systematic errors.

2.3.23.3. Future perspectives

The shift and width obtained in SIDDHARTA experiment does provide new constraints on theories, having reached a quality which will demand refined calculations of the low-energy $\bar{K}$N interaction. For further study of the $\bar{K}$N interaction, it is essential to measure the kaonic-deuterium K-series x rays to disentangle the isoscalar and isovector scattering lengths. The present result combined with deuterium data to be collected in the SIDDHARTA-2 experiment will provide invaluable knowledge about the behavior of low-energy QCD in the strangeness sector.

References

[1] J. D. Davies, et al., Phys. Lett. B 83 (1979) 55.
[2] M. Izycki, et al., Z. Phys. A 297 (1980) 11.
[3] P. M. Bird, et al., Nucl. Phys. A 404 (1983) 482.
[4] M. Iwasaki, et al. Phys. Rev. Lett. 78 (1997) 3067; T. M. Ito, et al., Phys. Rev. C 58 (1998) 2366.
[5] G. Beer, et al. (DEAR Collaboration), Phys. Rev. Lett. 94 (2005) 212302.
[6] M. Bazzi, et al., Phys. Lett. B. 704 (2011) 113

2.3.24. E-24: Biophysics and Radiobiology Team Activity Report (2007-2011)

2.3.24.1. Introduction

The Biophysics and Radiobiology Group has a multidisciplinary composition (structure), in accordance with the diversity of the (addressed) approached topic. Based on the acquired expertise in the study of the biological effects of ionizing radiation, the research activities were diversified towards connected domains as toxicity of nano-structured materials or cellular oxidative stress. Biophysics and Radiobiology Group has expertise also in the field of molecular and cellular biophysics and benefits of high quality infrastructures as: specific experimental equipments for spectrometry and microscopy, cell cultures laboratory, animal housing, IT infrastructure, etc. In the last period the group was involved in projects related to peptides–model membrane/cell cultures interactions, oxidative stress in large impact diseases (diabetes, cardio-pathologies), nuclear applications in cancer diagnosis and treatment. Accordingly, the ongoing activities in the group address basic research problems, applicative research domain and also provide some services in the frame of an authorized laboratory.

2.3.24.2. Present status of experimental research, theoretical understanding, and future challenges

At present, the on going basic research activities cover the following domains:

1. Cellular radiosensitivity in pathologies associated with oxidative stress and DNA repair impairment - multiple sclerosis, cancer.

Chromosomal radiosensitivity and apoptosis induced by external gamma irradiation were studied in peripheral blood lymphocytes cultures obtained from patients with genital cancer and patients with secondary progressive multiple sclerosis. The results were discussed also in correlation with the level of oxidative stress biomarkers (carbonil contents in plasma proteins, antioxidant activity of plasma) associated with these pathologies. Part of the research was performed in collaboration with the University of Ghent, Belgium.

2. Epigenetic, nontargeted effects induced by low dose and low dose rate irradiation: adaptive and bystander responses.

Adaptive and bystander effects are studied in fibroblasts cell cultures (L929 and V79) after low dose gama irradiation, UV exposures and bleomycine treatment. Bleomycin and gamma irradiation induced bystander responses reflected in increased DNA damage. The bystander effect is independent of the cell type studied. The clonogenic survival is also decreased following bystander exposure to the chemotherapeutic agent. Further work will address the mechanisms involved in transmission of the toxic signal from treated to bystander cells.

3. Oxidative stress biomarkers in large impact diseases (diabetes, cardiopathology).

In collaboration with the University Hospital, Bucharest a follow up study was performed in the attempt to correlate the “supranormal” cardiac functions of athletes to their arterial and endothelial functions and also with plasma oxidized proteins (carbonyl group content) level and antioxidant capacity [26.1]. In the same context an other experiment was performed blinded to patients’ histories and to allocated treatment in order to correlate the myeloperoxidase (MPO) plasma levels with the cardiac conditions. MPO were measured in plasma samples taken from patients at baseline (W0) and after 24 weeks (W24) of the follow-up period.

In collaboration with the Faculty of Biology, Bucharest University, the oxidative stress alterations were studied on type I autoimmune diabetic mice. The effects at the level of neurons functionality have been investigated in primary neuronal cell cultures by intracellular calcium imaging technique.

4. Protein-lipids interactions in membrane model (liposomes); interactions of membrane channels forming peptides with artificial lipid membranes modeling the mammalian and outer bacterial membranes. The mechanism of antimicrobial peptide and protein insertion in lipid bilayers with different compositions was addressed by fluorescence spectrometry techniques [26.2, 26.3, 26.4].

Part of this work is done in collaboration with the Biomedical Research Institute at the University of Hasselt (Belgium) by means of a joint PhD program.

5. Dynamics of water in living cells

Study of density oscillations in a model of water and other similar liquids was performed and biological inferences in quantum biology were discussed [26.5, 26.6, 26.7].

The on going applicative research performed in address the following problems:

1. Development of immunochemical techniques RIA (Radioimmunoassay) and ELISA (Enzyme Linked Immunosorbent Assay) for detection of extremely low concentrations of substances in biological or environmental samples.

Immunochemical techniques have been obtained for detection of the steroids nandrolone and trenbolone in biological samples and of the pesticide 3,6 dichloro-2-methoxybenzoic acid (dicamba) in alimentary and environmental samples. Kits with different chemical and immunochemical products and reagents were developed. The results of the research activity were published in two scientific papers [26.8] and eight national patents [26.9, 26.10]. Two of the patented inventions were awarded with gold medals at 39th International Exhibition of Inventions of Geneva 2011 and at 9th ARCA 2011 International Innovation Exhibition, Zagreb, Croatia. One of the patented inventions was awarded with silver medal at 39^{th} International Exhibition of Inventions of Geneva 2011.

2. In vitro and in vivo toxicology type studies for radio-pharmaceuticals designed in the Department of Radioisotopes and Radiation Metrology (HH-NIPNE) for cancer diagnosis and cell targeted radiotherapy

188Re radiolabeled DOTA-TATE and 188Re-anti-VEGF-Mab cytotoxicity (DNA damage observed by comet assay, apoptosis induction, cell viability) was tested at cellular or whole body level, on cell cultures and on rats. Bioaffinity of radiolabeled neurotensin and 99mTc dextran manose conjugate to specific receptors were studied in collaboration with our colleagues from DRRMD on cell cultures and on rats [26.11, 26.12].

3. Toxicity of nano-structured materials

In collaboration with the National Institute of Material Physics studies were conducted on comparative toxicity due to form modification in TiO2 monocrystallites or due to nanoparticle aggregation in self-assemblage processes. The induced cytotoxicity was tested on fibroblast cultures (V79), the end-points of interest being the cellular viability, the proliferation capacity and the chromosomal aberration induction.

More recently we started a scientific collaboration with the National Institute for Lasers, Plasma and Radiation Physics on the biocompatibility of adherent or free-standing structures of hybrid polymers (ormosils) laser processed in view of tissue engineering applications [26.13].

4. Atomic and nuclear surface analysis methods: A perspective for the characterization of dental composites, microelements distributions in dental composite materials and in normal/pathological bone tissues measured by nuclear methods.

Particle induced X-ray emission (PIXE), proton m-PIXE and particle induced gamma-ray emission (PIGE) measurements were used in the study of microelements distributions in dental composite materials and in normal or pathological bone tissues. Complex changes were evidenced in composite materials throughout their use and in the study of normal and in vitro demineralized dental enamel [26.14, 26.15].

Services provided in the frame of an authorized laboratory:

Biocompatibility Evaluation of Medical Materials and Devices Laboratory (BIOEVAL) is part of the Biophysics and Radiobiology Group and has implemented a quality management system for testing laboratories according to SR EN ISO/CEI 17025 and ISO 10993 documents used in the evaluation of effects of medical materials and devices upon human body.

BIOEVAL provides services in some of the specific test required to make the preclinical evaluation of biocompatibility of medical materials or devices: In vitro methods for testing cytotoxicity: (i) Evaluation of cell cultures by agar diffusion and (ii) Evaluation of cell cultures by elution test. The BIOEVAL Laboratory was accredited by the national accreditation authorities (RENAR) in 2010. Companies from medical devices industry (textiles, wound dressing, and plastic materials) are our end-users for this type of services.

The biocopatibility tests were used also in the research projects, especially in those involving the development of new materials: cytotoxicity of two types of wound dressings (with and without hydrocolloid, composed of triglycerides and ZnO nanoparticles doped with silver) was analyzed and the results are under publication.

2.3.24.3. For the perspective

In the field of basic research following issues are intended to continue:

-The epigenetic, nontargeted effects produced by irradiation - mechanistic studies to understand the bystander response of cells in the context of their importance for risk assessment in radiotherapy.

-The radiobiological studies will be oriented also towards the development of complex cellular systems (co-cultures of lymphocytes and endothelial cells or oligodendrocytes with neuronal cells) in order to be used as cell-cell interaction biological models, appropriate for the understanding of the low dose irradiation effects on circulatory and nervous systems.

-The molecular and cellular biophysics research related to large impact diseases involving oxidative stress will be continued especially addressing issues as: exploiting stem cells as a tool providing solutions for new therapies, the peptide-biomimetic membranes interaction.

-Quantum models in cellular biology: water structure studied by Raman spectrometry.

In the field of applied research following issues are intended to continue:

-Radiosensitivity and repair capacities of lymphocytes in cancer patient after radiotherapy exposure;

-Toxicology (performed in vitro and in vivo) on radio-pharmaceuticals products developed in NIPNE and intended to be used in radio immunotherapy.

-Homogenous ELISA technique based on nanoimmunosorbents (functionalized nanoparticles).

-The cell response in interaction with different nanostructured materials will be extended in view of developing new biotechnological applications

References (supplementary to list in the sheet Articles)

2.3.26.1. Florescu M., C. Stoicescu, S. Magda *et al*., Echocardiogr-J Card., **27**, (2010) 6, 659-667.

2.3.26.2. Nae M., Gazdaru D., **Acasandrei A.** *et al*., J. Pep. Sci., **14**, (20085) 9, 1003-1009.

2.3.26.3. **Bacalum M**., Weingart H., **Radu M.**, Rom. J. Bioph **19** (2009) 105-116.

2.3.26.4. Radu B.M., **Bacalum M.**, A. Marin *et al*., J. Fluoresc, **21** (2011) 4, 1421-1429.

2.3.26.5. Apostol M., **Preoteasa E.**, Phys. Chem. Liq., **46(6)** (2008) 653- 668.

2.3.26.6. Ionescu-Tîrgoviste C., *et al*., Rom. J. Diabet. Nutr. Metabol. Dis., **16** (2009) 1-5.

2.3.26.7. **Preoteasa E.A.**, M.V. Apostol, arXiv-0812.0275v2-physics-bio-phys-12-Dec- (2008).

2.3.26.8. **Dorobantu I., Harangus L., Radu M.**, Rom. J. Bioph **19** (2009) 63-72.

2.3.26.9. **Dorobantu I., Harangus L.,** Brevet OSIM nr. 125452/30.06.2011.

2.3.26.10. **Dorobantu I., Harangus H**., Cerere brevet de inventie nr. OSIM A /01039/11.12.2009.

2.3.26.11. Chiper D., Lungu V., Barna C. *et al*., J. Labelled Comp Rad., **53** (2010) 463-465 .

2.3.26.12. Niculae D., Lungu V., Iliescu M., **Savu D**., J. Labelled Comp. Rad., **53** (2010) 275-279.

2.3.26.13. Matei A., Dinescu M., Buruiana E.C. *et al*., Dig. J. Nanomater. Bios. **6** (2011), 29-35.

2.3.26.14. **Preoteasa E.A**., Preoteasa E., Ciortea C. *et al*., X-Ray Spectrom., **38** (2009) 548-556.

2.3.26.15. Preoteasa E.A., Preoteasa E. *et al*., X-Ray Spectrom., 37, 5, 517-535 (2008)

2.3.25. E-25: Environmental Physics team Activity Report (2007-2011)

2.3.25.1. Introduction

Consistent with IFIN-HH mission and the DFVM commitments, the Environmental Physics Team seeks to secure, maintain and develop appropriate tools enabling it to perform comprehensive radiological assessments relating to nuclear facility siting, operations, and decommissioning; the management of radioactive sources and radiation devices; the occupational and public exposure; the environmental radioactivity monitoring of the Institute premises; the meteorological and radiological survey of the site; and the nuclear emergency planning, preparedness and response.On these lines of action the past four years have seen notable achievements in the development and implementation of expert systems to support decision making in the assessment of nuclear accidents or radiological emergencies; the generation of original methods, models and computing codes in quantitative risk analysis and complex system vulnerability assessment focusing on critical infrastructures; and, given the fact that Nuclear Power in Romania relies on CANDU reactors, a special line of research was devoted to the assessment of radiological impact of tritium emissions featuring this reactor type. The team includes 6 senior researchers and two researchers, PhD degrees.

2.3.25.2. Present status of research

The reference European expert system RODOS (Real time on-line decision support) has been developed as a result of collaborative actions in the European Community Framework programmes. It is currently implemented in national or regional nuclear emergency centers, including the Romanian response system, providing coherent support at all stages of an accident (i. e., before, during and after a release) and also covering the long term management and restoration of contaminated areas. The main RODOS-related activities in Romania consisted in the customization and adaptation of RODOS to Romanian conditions (e.g. type of nuclear power units) and its installation in the Nuclear Accident and Radiological Emergency Centre (CANUR) of General Inspectorate of Emergency Situations (IGSU). A complementary major expert system is MOIRA, adapted to radioactive releases in surface waters, developed and applied to Danube's river. The systems were made available to decision makers during the emergency exercises for CANDU-NPP (Romania) or Kozloduj – NPP (Bulgaria). A class of domestic, lighter-weight computer codes for the radiological assessment of the health and environmental impact of nuclear accidents, radiological emergencies and the normal operation of nuclear facilities was also developed, to consolidate the concept of hands-on training in emergency preparedness, and the Institute's resident capability to promptly and independently answer calls from the Governance system and the media in case of nuclear emergencies. This resource, including the platforms like Notepad, SAT, RAT, EDAT, QVA are designed to be generic in model assumptions and constitutive equations; provide for specificity by offering exemplary case-input libraries; offer flexible option-oriented interfaces for model choice and data as well as comprehensive and convenient in use GIS facilities operated as I/O (input/output) platforms. A notable validation in practice of this working concept was obtained during the Fukushima nuclear crisis, March-May 2011 (*http://www.nipne.ro/fukushima_2011/*). The overall objective of the research performed was to enhance the operational capability of the expert systems to assist assessment and decision-making needs, thereby increasing their broader acceptance. Especially targeted was an improved applicability with respect to data network conditions; different categories of users; and a broader spectrum of release types and environmental conditions, [27.1]-[27.4], [27.20]. A naturally-connected activity was to develop operational procedures for the NERIS Platform on nuclear and radiological emergency response and recovery preparedness. The NERIS facility is supported by EC within the 7th Framework Programme and our team is one substantive participant in the project. The environmental physics team had an important contribution in the 6th EC Framework Programme module EURANOS (*European approach to nuclear and radiological emergency management and rehabilitation strategies*) with a contract-appointed activity mainly consisting in testing and the customization of Decision Support Systems, also providing guidance to emergency management organizations and decision makers on the establishment of an appropriate emergency response strategies. The research activity of the Romanian team was appreciated by the project leaders and an opening for IFIN-HH participation in the next NERIS platform was secured. The interest for tritium and carbon-14 risk assessment was emphasized in the last years and the Nuclear Safety Commissions in Canada and France pursued special programs. The “Horia Hulubei National Institute for Physics and Nuclear Engineering” (IFIN-HH) started a dedicated research program on tritium in the early 1990s and gradually increases its contribution at national and international scale up to the recent acceptation as a main contributor, [27.5]-[27.19]. A first tritium module was implemented in the past (2000) in the RODOS system of decision support and the full upgrade of the code started in the last years. Tritium is a “life radionuclide” and consequently, the dedicated research is based on an interdisciplinary approach combining Physics with Life Sciences. A complex dynamic model for ^{3}H and ^{14}C transfer in farm and laboratory animals, wild biota, and birds was developed and favorably tested with the available experimental data without any calibration with the specific data for ^{3}H and ^{14}C. The model for routine releases, recently upgraded, was incorporated in the technical documents and standards of the International Atomic Energy Agency. For aquatic releases of tritium, a complex dynamic model was developed and successfully tested with the experimental data (again, without any calibration), emphasizing the important role of Dissolved Organic Tritium (DOT) in thee aquatic environment. A robust and metabolically based model for human tritium dosimetry was developed and tested with human data, clarifying some important aspects in the debate of the so called “huge risk of tritium intake”. The coordination by IFIN-HH experts of the “Tritium Accidents” Working Group in the framework of IAEA’s EMRAS (*Environmental Modelling for Radiation Safety*) programme implied an international recognition of the scientific results obtained (see *http://emras2011.nipne.ro*). IFIN-HH contributes to many other aspects concerning tritium risk assessment. Its expertise is directly relevant to the needs of the national nuclear power generating capability (technology transfer), contributing to the revision of the derived release limits (DRL) for ^{3}H and ^{14}C emissions from CANDU reactors. The ongoing activity regarding Cernavoda NPP is devoted to tritium washout in the area. The visibility of tritium and carbon-14 research was demonstrated by 16 ISI publications, 3 publications in Romanian Journals, 4 chapters in books published by prestigious publishers and several participations to international conferences with invited or oral lectures. The topic dedicated to environmental modelling of tritium and carbon-14 transfer in ecosystems is of actual interest at the international scale; currently the topic is financed through the programme “IDEI 2011”. Radiological risk assessment implies an onsite meteorological and radiological survey system. The IFIN-HH system was developed following the experience of advanced nuclear institutes and operates non-attended in real time with reported processed information every 10 minute (see *http://meteo.nipne.ro*). As a research tool, the further development of the met tower will be linked to the atmospheric processes for non-homogenous conditions and the climate change influences on the nuclear safety. The scientific expertise of the team was employed in studies assessing the environmental impact of decommissioning IFIN-HH VVR-S research reactor. Notable is also the invited participation in the European project EURISOL, where a dedicated software platform was developed for the purpose of adapting Nuclear Power Safety knowledge tools to the health and environmental impact assessment of advanced particle accelerators handling radioactive ion beams.

2.3.25.3. Research perspective

The consolidated presence and visibility of the team in the literature and the international knowledge networks has recently determined a clearer internal organization in four Task Units: *Task Unit 1*: Implementation of European reference decision support systems for nuclear accidents and radiological emergencies. *Task Unit 2*: Modeling, Simulation and Visualization capabilities for health and environmental impact assessment of nuclear activities, threat and vulnerability analysis and risk assessment. *Task Unit* 3: Tritium Radio-ecology and the Onsite

Meteorological and Radiological Survey capability. *Task Unit 4*: The Onsite Environmental Radioactivity Monitoring capability. The essential lines of action envisaged for the forthcoming 3 to 5 years are: (a) The upgrading and the IT&C revamping of IFIN-HH Environmental Radioactivity Monitoring capability. (b) The development of a real-time onsite survey system for meteorology and radiations, including dedicated data-interpretative software. (c) The further advancement of reference IT&C systems in Europe for which the Institute holds a license and acts as a scientific contributor (RODOS, MOIRA). (d) The design, development and implementation of an educationally-oriented, comprehensive, web-based, interactive, facility for hands-on physical and mathematical modeling, simulation and visualization of radiological and industrial emergencies involving pollutant discharge and migration into the environment. (e) The enhancement of the inventory of experimental methods in meteorology in conjunction with the dosimetry of environmental radioactivity and pollution; (f) Solutions and applications directly instrumental in pre-processing online, real-time-acquired data to input decision support systems (meteorology, GIS, enviromental radioactivity). (g) The IT&C integration of the relevant infrastructure onsite, primarily the environmental radioactivity monitoring capability and the meteorological tower, into the concept of an *information facility on environmental radioactivity, radiological emergencies and related risks* and the rapprochement of the later to the Institute's *Nuclear Training Centre* and its curricular activities. (h) Adding-on new substantive features to the Institute's c*omputer and communications capabilities*. (i) Opening new channels of co-operation with academic institutions, public and private business enterprises and European vocational networks (NERIS etc.).

References

2.3.27.1. Hofman D., Monte L., Boyer P. *et al*.**,** J.Environ. Radioactiv. **102 (**2011) 119-127.
2.3.27.2. **Vamanu D.V., Slavnicu S.D.** *et al*.**,** Radiat. Prot. Dosim. **140** (2010) 191-201.
2.3.27.3. **Vamanu D.V., Vamanu B.I., Acasandrei V.T.** *et al*., Eur. Phys. J. A **44** (2010) 129–146.
2.3.27.4. **Vamanu D.V., Slavnicu S.D.** *et al*., Radiat. Prot. Dosim. **140** (2010) 191-201.
2.3.27.5. **Melintescu A., Galeriu D.**, Fusion Sci. Technol. **60** (2011) 1179 – 1182.
2.3.27.6. **Galeriu D., Melintescu A.**, Fusion Sci. Tech. **60** (2011) 1232 – 1237.
2.3.27.7. Yankovich T.L., Kim S.B. *et al*. J. Environ. Radioactiv. **102** (2011) 26-34.
2.3.27.8. Atanassov D., **Galeriu D,** J. Environ. Radioactiv.**102** (2011) 43-52.
2.3.27.9. Takeda H., Fuma S., Miyamoto K., Yanagisawa K *et al*., Health Phys. **99** (2010) 668-673.
2.3.27.10**. Melintescu A., Galeriu D.**, Radiat. Environ. Bioph. **49** (2010) 657-672.
2.3.27.11. **Galeriu D., Melintescu A.** J. Radiol. Prot. **30** (2010) 445-468.
2.3.27.12. **Galeriu D.**, Davis P., Workman W., J. Environ. Radioactiv.**101** (2010).
2.3.27.13. Takeda H., Fuma S., Miyamoto K. *et al*., Health Phys. **96** (2009) 587-593.
2.3.27.14. **Galeriu D., Melintescu A.** *et al*., Radiat. Environ. Bioph. **48** (2009) 29–45.
2.3.27.15. Koarashi J., Davis P.A., **Galeriu D.** *et al*., J. Environ. Radioactiv.**99** (2008) 1671-1679.
2.3.27.16. **Galeriu D.**, Davis P., Raskob W., **Melintescu A.**, Fusion Sci. Tech. **54** (2008) 237-242.
2.3.27.17. **Melintescu A., Galeriu A.**, Fusion Sci. Tech. **54** (2008) 269-272.
2.3.27.18. **Galeriu D., Melintescu A.**, *et al*., J. Environ. Radioactiv. **98** (2007) 205 – 217.
2.3.27.19. **Galeriu D., Melintescu A.**, , H. Takeda, Radiat. Prot. Dosim. **127** (2007) 153-157.
2.3.27.20. **Margineanu R., Simion C.** *et al*., Appl. Radiat. Isotopes **66** (2008) 1501-1506.

2.3.26. E-26: Radiological Monitoring of Environment and Occupational Dosimetry (RMEOD) Team Activity Report (2007-2011)

2.3.26.1. Introduction

The activities of RMEOD team are held in four work units, respectively Environmental and Occupational Exposure Dosimetry (LDPM), Integrated Laboratory for α -, β -, and γ - Measurements in Environmental Samples and Materials (SALMROM), Whole Body Monitoring Laboratory (USCIR-CCU) and Laboratory of Radiochemistry for Environmental Samples (LRPM). Of the four units of the group, the first two (LDPM and SALMROM) are acredited by the Romanian Accreditation Association (RENAR) and the rest (USCIR-CCU and LRPM) are notified by the National Commission for Nuclear Activities Control (CNCAN).

2.3.26.2. Present status of activity

Based on the organizational framework presented above, the RMEOD team performs specialized activities covering the following four areas: (i) basic and applied research, (ii) current environmental monitoring, (iii) routine and special dosimetric control of occupational exposure to radiations, and (iv) a range of specific services offered to external partners (*i.e.* quantitative and qualitative analyses of radioactivity in different materials and environmental samples including also foodstuffs, reading of TL detectors and dosimetric films, repairing/reconditioning of radiation detectors for industrial use).

In the period covered by this evaluation, part of the RMEOD team - working in LDPM - collaborated (together with other responsible departmens of the institute) to the action “Radiological characterization of environment in the area of influence associated to the nuclear objective IFIN-HH”. Participation has resulted in producing the reference document (Referential) entitled “Derived Emission Limits” (approved by the National Commission for Nuclear Activities Control, subjected to annual revision) as well as in monitoring the environmental radioactivity in the influence area of IFIN-HH and the radioactive emissions from the source. Another activity of LPDM members to be discussed for the period of evaluation includes the applied research on the use of passive TL dosimetric system (with thermoluminiscent detectors) and of the fotodosimetric system (with dosimetric film) for external dosimetry in occupational exposure to radiation. The results of this activity were materialized by obtaining the “Radiological Safety Assurance” certificate, based on the recognition of technical competence by the National Commission for Nuclear Activities Control (CNCAN notification) and by the Romanian Accreditation Association (RENAR accreditation), and also by a significant number of papers published in journals [28.1 – 28.7].

Another topic covered by the members of LPDM is related to (i) applied research in the field of soil erosion and sedimentation processes (by using ^{137}Cs, ^{7}Be and ^{210}Pb as environmental tracers) [28.8], and (ii) basic research in the field of ultralow level measurements of radiation background [28.9 – 28.14] and that of astroparticle physics [28.15], conducted in the deep underground of “UNIREA” salt mine at Slanic Prahova-Romania. Regarding the topic (ii) basic research in the field of ultralow level measurements of radiation background, it is worth mentioning the participation of some members of the LPDM team to the international project entitled “Design of a pan-European Infrastructure for Large Apparatus studying Grand Unification – LAGUNA” (EC FP7 grant 212343), project carried out in the period 2008-2011.

In 2009-2011 period, LDPM was partner in the research programme “Belgian assistance to eastern and central Europe and CIS-countries related to nuclear safety”, based on a MoU signed between the Belgian Nuclear Research Centre (SCK•CEN) and IFIN-HH, and covering two topics of current interest: (i) dosimetry in radiation protection, (ii) environmental toxicology associated with the exposures to mixtures of radionuclides and heavy metals.

The activity of SALMROM is conducted according to standard EN/ISO 17025:2005 and covers (i) measurements of environmental samples with MPC 2000 α/β global system and OCTETE α spectrometric system [28.16], (ii) measurements for radon activity and of α radioactive gases, *in situ* and in environmental samples, by using PYLON AB 5 system and CIS-Rn-XX system [28.17], (iii) γ-spectrometry of environmental samples and radioactive materials (by using ORTEC spectrometric system equipped with HPGe detector) [28.18], and (iv) manufacturing and use of pressurized ionization chamber type detectors for industrial applications [28.19]. In addition to papers published in journal, the activity conducted by group's members working in SALMROM also led to elaboration of four invention patents, one in the field of γ-spectrometry [28.20] and tthree other regarding detectors [28.21 – 28.23].

The activity of team's members working in USCIR-CCU is focused on the installation and calibration of the new whole body counter equipment, based on hyperpure germanium and NaI(Tl) scintillation detectors, for accurate in vivo assessment of the internal contamination with gamma emitting radionuclides retained in the whole body or in the thyroid. In the year 2008, USCIR-CCU obtained a new notification from the National Commission for the Control of the Nuclear Activities (CNCAN), in accordance with the WBML-specific quality assurance programme. The research activity performed in USCIR-CCU, is oriented towards the development of the monitoring methods, of data processing and of the calibration methods for the gamma spectrometric systems, applying numerical Monte Carlo codes. The results were published in national journals [28.24 – 24.26], international journals [28.27, 28.28], or presented at international conferences [28.29, 28.30]. The constant collaboration of USCIR-CCU with the European Dosimetry Organization, EURADOS, has made possible the implementation, in USCIR-CCU, of the new international standards in the field. (ICRP78, ISO20553, ISO11929, IDEAS Guidelines).

Team members working in LRPM deal with radiochemical techniques, methods of analytical chemistry and liquid scintillation spectrometry used to determine the content of some β-emitting radionuclides (^{3}H, ^{14}C, ^{90}Sr, ^{210}Pb) and natural elements (U, Th, Fe) in a large range of environmental samples, for tracking their movement in different components of terrestrial, aquatic and aerial environments [28.11, 28.31, 28.32].

Regarding service activity of the whole team, addressed to external partners, has to be mentioned the number of beneficiaries exceeding 150, for whom the RMEOD team conducted annually over 5,000 TLD readings, 10,000 dosimetric film readings and 500 whole body measurements.

2.3.26.3. For the perspective

Aiming to the future, the RMEOD team is considering the enforcement of the following plans:

- Modernization and computerization of radiological monitoring system for for contributing to the development of a reliable database, accessible on-line to all those interested;
- Participation to new (or already in progress) international research projects and other coordinated actions , as:
  - LAGUNA-LBNO—Design of a pan-European Infrastructure for Large Apparatus studying Grand Unification, Neutrino Astrophysics and Long Baseline Neutrino Oscillations (2011-2014);
  - Radiation background of Black Sea coastal environment - RACE, BLACK SEA ERA.NET - Pilot Joint Call (2011-2014);
  - On-line launch of expressions of interest for the realization of European partnerships for extending the tematic areas of the SALMROM;
  - Participation of the SALMROM in Proficiency Test – IAEA-TEL;
  - Developing to apply Monte Carlo methods in internal dosimetry, as a future research task for USCIR-CCU.

Expanding the range of services offered to external partners.

References

2.3.28.1. **Stochioiu A.**, Sahagia M., Bercea S. *et al*., Rom. J. Phys. **53/7-8** (2008), 801-807
2.3.28.2. **Stochioiu A.**, Sahagia M., **Tudor I.**, Rom. J. Phys. **54/7-8** (2009), 711-719
2.3.28.3. **Stochioiu A.**, Sahagia M., Bercea S. e*t al.*, Rom. Rep. Phys. **61/3** (2009), 581-586
2.3.28.4. **Stochioiu A.**, Bercea S., Sahagia M. *et al*., Rom. J. Phys. **56/5-6** (2011), 757-761
2.3.28.5. **Stochioiu A.**, **Tudor I., Gheorghiu A.,** Rom. J. Phys. **56/5-6** (2011), 762-768
2.3.28.6. **Galeriu D., Melintescu A.** *et al*., Rom. Rep. Phys. **63/1** (2011), 115-127
2.3.28.7. Ghitulescu Z., **Stochioiu A.**, Dumitrache M., Rom. Rep. Phys. **63/3** (2011), 700-706
2.3.28.8. **Margineanu R.**, N. Popa N. e*t al.*, J. Environ. Prot. Ecol. **8/1** (2007), 197-203
2.3.28.9. Bordeanu C., Rolfs C., *et al.*, J. Phys. G: Nucl. Part. Phys. **35/1** (2008), 014011
2.3.28.10. **Margineanu R.**, **Simion C.** *et al.*, Appl. Radiat. Isotopes **66/10** (2008), 1501-1506
2.3.28.11. **Margineanu R.M.** *et al.*, App. Radiat. Isotopes **67/5** (2008), 759-761
2.3.28.12. Aalseth C. *et al.*, J. Radioanal. Nucl. Chem. **282/3** (2009), 731-735
2.3.28.13. Cristache C., **Simion C.A.** *et al.*, Radiochim Acta **97/6** (2009), 333-337
2.3.28.14. **Margineanu R.**, Mitrica B. *et al.*, Environ. Res. Lett. **6/3** (2011), 034011
2.3.28.15. Mitrica B., **Margineanu R.** *et al.*, Rom. Rep. Phys. **62/4** (2010), 750-757
2.3.28.16. **Calin M.R.**, Druker A.E., Rom. J. Phys. **56/3-4** (2011), 373-387
2.3.28.17. **Calin M.R.**, Calin M.A., J. Radioanal. Nucl. Chem. **286/1** (2010), 169-173
2.3.28.18. **Calin M.R.**, Calin M.A. *et al.*, J. Radioanal. Nucl. Chem. **288/2** (2011), 547-552
2.3.28.19. **Calin M.R.**, Calin M. A. *et al.*, J. Optoelectron. Adv. M., **13** (2011), 1193-1196
2.3.28.20. **Calin M.R.**, Patent OSIM, No. A/00069/27 January 2010
2.3.28.21. **Calin M.R.**, Patent OSIM No. A 2008 00375/22 May 2008
2.3.28.22. **Calin M.R.**, Patent OSIM, No. A /00219/08 March 2010
2.3.28.23. **Calin M.R.**, Patent OSIM, No. A/00451/10 05 2011
2.3.28.24. **Saizu M.A.**, Rom. Rep. Phys., **61/4** (2009), 662-668
2.3.28.25. **Saizu M.A.**, Rom. Rep. Phys., **63/3** (2011), 723-728
2.3.28.26. **Saizu M.A.**, **Calin R.M.**, Rom. J. Phys. **56/9**-10 (2011) in press
2.3.28.27. **Saizu M.A.**, J. Radioanal. Nucl. Chem. 10.1007/s10967-011-1397-z, 2011 in press
2.3.28.28. **Saizu M.A.**, Radiat. Prot. Dosim. **144/1-4** (2011), 137-139
2.3.28.29. **Saizu M.A.**, Europ. Conf. on Individual Monit. of Ionizing Rad., Greece, 2010
2.3.28.30. **Saizu M.A.**, Third European IRPA Congress,Helsinki, Finland, 14-18 June 2010
2.3.28.31. **Simion C.A.** *et al.*, J. Labelled Compd. Rad., **53/5-6** (2010), 308-312
2.3.28.32. **Simion C.A.** *et al.*, J. Labelled Compd. Rad, **53/5-6** (2010), 478-482

2.3.27. E-27: Radionuclide Metrology Research Team. Activity Report (2007-2011)

2.3.27.1. Introduction

The first radioactivity standards were prepared by Marie Curie and Otto Hönigschmidt in 1911 by weighing very precisely small quantities of radium chloride and sealing them in Thuringian glass ampoules. Two pieces of the series were chosen as the BIPM in Sèvres and in the Institut fur Radiumforschung in Vienna as *primary standards.* All the others were compared with these standards. In 1934, Professor Hönigschmidt prepared other 21 samples, which constituted the first national radioactivity standards.
They were approximately immuable (^{226}Ra has $T_{1/2}$ = 1600 years) and universal as at that time no artificial radioisotope was discovered. The activity unit "Curie" was established as the number of α particles emitted during one second by the radon in equilibrium with 1 g of radium, namely 3.7 x 10^{10} s^{-1}. In 1950, this activity unit was attributed to all the radioactive isotopes. Recently, the SI unit Becquerel, 1Bq=1 s^{-1} replaced it.
The obtaining of the artificial radionuclides, changed the meaning of standards, as many of them had much shorter half-lives, and consequently the mass of substance was no more an activity measure, and the measurement of the activity had to be carried out by measuring the effects of the emitted radiations. These are very different from a radionuclide to another, what is usually accepted as having different disintegration schemes. Particular methods for the standardization of every radionuclide were developed. The new international system of radioactivity standards consisted from the international comparisons of the measurements made by the national laboratories. During the period 1955-1958 several comparisons were organized by the International Commission for Radiation Units (ICRU). Since 1963, this responsibility has been transferred to the BIPM. Our laboratory has participated constantly in these comparisons since 1962. At present, it is recognized that such large-scale comparisons must be organized only for special situations (new radionuclides, new methods to be validated, etc). For gamma-ray emitting radionuclides, the "System International de Reference" (SIR) is used. Set up at BIPM-Sevres, establishes the degree of equivalence between the participating laboratories. Both types of such comparisons, relying only on primary (absolute) methods are recognized as *key comparisons.*
At the national scale, the national metrology labs must assure the continuity of the traceability chain. They deal with the development of the most precise and adequate methods and equipment for standardization of radionuclides. The first step in assurance of the local traceability is the elaboration of the adequate types of radioactivity standards-solid, liquid, gas standards whose activity is certified with uncertainties of 0.1%-5% for a defined coverage factor k. Adequate methods for using the standards in special measurements are put into operation too, to be offered to the laboratories.
In the last years, the radionuclide metrology experts were required to be implied in the study of the decay schemes of radionuclides, involving both the experimental determination of the half life and emission intensity of radiations during the disintegration of radionuclides, and evaluation, based on statistics methods, of the published data. This is a concentrated international effort, and its solution is possible only within the frame of international projects.

2.3.27.2. Present status of research

The main directions of work are directed towards the following aspects:

2.3.27.2.1. Creation of the experimental basis and elaboration of new methods for absolute (primary) and relative standardization methods , aimed to enlarge the number of radionuclides, their physical state and improve the activity uncertainty.

On this purpose, the following new installations were put into operation during the reported period:

- A new electronic set-up for the traditional $4\pi\beta$-γ coincidence system;
- A new detection block, consisting from a new optical chamber and a set of six channel photomultipliers was constructed for the liquid scintillation counter-triple to double coincidence ratio (LSC-TDCR) set up;
- A new gamma-ray spectrometer, based on a high efficiency and resolution HPGe and PC-analysis, having implemented softwares for processing of spectra;
- The primary Romanian radon standard and a metrologigal traceability chain of the activity unit, from primary to secondary standards was constructed and the method was elaborated;
- The secondary system, well type ionization chamber, was improved by the use of a high quality electrometer;
- A gamma-gamma coincidence detection block was constructed and used;

2.3.27.2.2. Validation of installations and primary standardization methods by participation in international key - and supplemetary comparisons, aimed to establish the international equivalence of the Romanian primary standards. On the other hand, the results obtained in these comparison are practically useful, within the frame of the CIPM-MRA for the approval and publication of the Calibration and Measurement Capabilities (CMCs) of the RML.

2.3.27.2.3. Participation at international projects for the study of the decay data, measurement and evaluation. The studies were performed within the EURAMET (EUROMET), projects, prior to the initiation of the EURAMET- European Metrology Research Programme (EMRP) and within the Decay Data Evaluation Project (DDEP) and IAEA dedicated CRP for actinides of interest in nuclear energy.

2.3.27.2.4. Assurance of the national traceability of activity standards, by: developing new types of radioactive standards, elaboration of new methods for equipment calibration and organization of interlaboratory comparisons and proficiency tests.

2.3.27.3. The future directions for research

2.3.27.3.1. Development of the national standard system for the radionuclides to be used in nuclear medicine for diagnostic and targeted therapy

Two new projects are under development:

- The Project PN-II-ID-PCE-2011-3-0070, entitled: “Absolute standardization and study of the decay parameters for positron emitters used in PET systems. Assurance of the metrological traceability” **Ctr. 23/05.10.2011**, financed by ANCS-CNCS-UEFISCDI, having as object the development of a primary activity standard for PET radionuclides produced and/or used in Romania and study of their decay scheme parameters. The radionuclides proposed to be studied are: ^{68}Ga, ^{18}F, ^{67}Cu and ^{124}I.

This new project will enlarge the basis of radionuclides to be absolutely standardized and their decay scheme studied, as for example ^{64}Cu, studied within the **ANCS – IFIN-HH contract no. 37N/27.02.2009**

Project. PN 09 37 02 05 „Research for the development for the Romania’s basis of standards in the domain of ionizing radiations for medical and environmental radioactivity applications”

Phase 2/2011: Participation at the project EURAMET 1085: Absolute standardization of activity and study of gamma-ray emission intensities for the radionuclide ^{64}Cu.

- The proposed Joint Research and Development Project within the General Accord for Cooperation for Scientific Research existent between the Institute of Atomic Physics (IFA), Romania and Commissariat a l’Energie Atomique (CEA), France, entitled: ”Creation of national standards for some emerging pharmaceutical radionuclides to ensure the radioprotection of patients and medical staffs". The proposed radionuclides are: ^{186}Re, ^{177}Lu, ^{82}Sr-^{82}Rb and ^{90}Y. This project was submitted at IFA and is under evaluation.

2.3.27.3.2. Continuation of the project regarding the assurance of the metrological traceability for radon standard.

Construction of a radon chamber, to be used for the calibration of the equipment used for radon measurement**. Funding Application for Joint Applied Research Projects PN-II-PT-PCCA-2011-3. Project title: Realization of a Radon Chamber – Calibration Stand for the Equipment Used in the Measurement of Radon and Daughter Products Concentration in Air**

This is the object of a Partnership Project, proposed to be accomplished in collaboration with the National R&D Institute for Cryogenic and Isotopic Technologies (ICSI) - Rm. Valcea and the University of Bucharest, Physics Faculty.

2.3.27.3.3. Participation at international projects within the frame of the EURAMET-EMRP, A169.

RML is involved as participant in two projects, as follows:

- Joint Research Project (JRP) – Contract: Metrology for new generation nuclear power plants. Metrofission, number ENG08. Coordinator – Dr. Lena Johansson, NPL-UK. Start date: September 2010. Participation in WP8.

- JRP IND04 – Ionizing radiation Metrology for Metallurgical Industry. MetroMETAL, Coordinator: Dr. Jose Maria Los Arcos, CIEMAT - Spain. Start date December 2011.
Participation in WP2, WP3 and WP5.

References

[1] M.Sahagia. CIPM-CCRI(II), 17-19 June 2009 Meeting, Presentation. "Horia Hulubei" National Institute of Research and Development for Physics and Nuclear Engineering, IFIN-HH, Bucharest, Romania, Radionuclide Metrology Laboratory – Report: May 2007 – June 2009; CIPM-CCRI(II), 21-23 June 2011 Meeting, Presentation. IFIN-HH, www.nipne.ro Radionuclide Metrology Laboratory – Report: June 2009 – June 2011

[2] C. Ivan, A. C. Wätjen, P. Cassette, M. Sahagia, A. Antohe, E.L. Grigorescu. *Participation in the CCRI(II)-K2.H-3 comparison and study of the new TDCR-LS counter with 6 CPMs.* Appl. Radiat. Isotopes. 68(2010)1543-1545

[3] C.Ivan, P. Cassette, M. Sahagia. *A new TDCR-LS counter using channel photomultiplier tubes.* Appl. Radiat. Isot. 66, 6-7(2008) 1006 -1011

[4] M. Sahagia, A. Luca, A. C. Wätjen, A. Antohe, C. Ivan, C.Varlam, I. Faurescu, P. Cassette. *Establishment of the ^{222}Rn traceability chain with the Romanian Standard System*. Nuclear Instruments and Methods A 631 (2011) 73-79

[5] M.Sahagia, D.Stanga, A.C.Wätjen, A.Luca, P.Cassette, C.Ivan, A.Antohe . *The Rn-222 standard system established at IFIN-HH, Romania.* Appl.Radiat.Isot. 68 (2010) 1503 -150

[6] A.Antohe, M. Sahagia, A.Luca, Ph. Cassette, C.Ivan. *Influence of detection efficiency on the measurement of radon by liquid scintillation counting.* LSC 2010, Advances in Liquid Scintillation Spectrometry, Conference, Paris, France, September 6-10, 2010**,** P-76. Accepted at Radiocarbon

[7] M.Sahagia, A.C.Wätjen, A.Luca, C.Ivan. *IFIN-HH ionization chamber calibration and its validation; electrometric system improvement* Appl. Radiat.Isot. 68(2010) 1266 – 1269

[8] M.Sahagia, C.Ivan, E.L.Grigorescu, A.C.Razdolescu. *Standardization of I-125 by the coincidence method and practical applications*. Appl. Radiat. Isot. 66, 6-7(2008)895-899

[9] C.Michotte, S.Courte, G.Ratel, M.Sahagia, A.C.Watjen, F.Fitzgerald, F-J. Maringer
Update of the ongoing comparison BIPM.RI(II)-K1.Co-60 including activity measurements of the radionuclide Co-60 for the IFIN-HH (Romania), NIST (USA) and the BEV(Austria). Metrologia Technical Supplement 47(2010) 06010.

2.3.28. E-28: Radiopharmaceuticals Research Team. Activity Report (2007-2011)

2.3.28.1. Introduction

Nuclear Medicine demands continuous developments in technology, radiopharmaceuticals, procecedures and patient care. Novel targets for imaging have emerged, such as labelled glucose for the imaging of cancer, labelled somatostatin tracers for the imaging of neuroendocrine diseases, beta CIT homing onto the dopamine transporter etc. Progress is coming in the imaging of Alzheimer`s disease, the imaging of atherosclerotic plaque and the imaging of angiogenesis and hypoxia. Sentinel lymph node detection has changed the surgical management of patients with breast cancer. At the same time, all diagnostic procedures have benefited from major progress in instrumentation and in the last 5 years, the emergence of multimodality imaging has become routine: conventional gamma cameras have been linked to CT scanners SPECT/CT and modern PET scanners have been linked to multi-slice CT devices (PET/CT).

Nuclear Medicine therapy has also been growing far beyond the established treatment of benign and malignant disease of thyroid. I-131 when linked to metaiobenzylguanidine is used in treatment of neuroendocrine malignancies, such as pheocromocytomas and neuroblastomas. Newer ligands targeting the SS2 receptor subtypes are emerging, labelled with Yttrium 90, Luthetium 177, Rhenium 188 and other radionuclides. Pain palliation in advanced metastatic and skeletal prostate and breast disease has become available with Strontium 89 chloride, Rhenium 186 as etidronate, Samarium 153 as ethylene-diaminetetramethylene phosphonate. Several radiolabelled antibodies have been entered in clinical trials and some have now been approved as specific treatment options.

2.3.28.2. Infrastructure

Practical applications of nuclear techniques are more and more present in the IFIN-HH's activity, having a history of over 30 years in the research and production of radiopharmaceuticals. The Radiopharmaceuticals Research Group benefits from an existing infrastructure, to be augmented in the next few months by the commissioning of the Research Center for Radiopharmaceuticals (CCR) - a state of the art facility. These includes:

a) a cyclotron, compact type, completely automated and PC controlled, variable energy of 14-19 MeV protons and 8-9 MeV deutrons (dual particle), 4 beam lines and up to 16 beams extractor, accelerated at the last ray; working simultaneously in "dual beam" system;

b) dedicated target chambers for short-life radioisotopes, such as ^{18}F, ^{124}I, ^{15}O, ^{13}N, ^{11}C, ^{64}Cu;

c) ventilated hot cells with telepliers, for handling high activities;

d) hot cells for smaller activities, ventilated and connected to water, compressed air, liquid radioactive waste and technical gases;

e) radiochemistry automatic systems for radiopharmaceuticals synthesis in sterile environment;

f) clean rooms, according to GMP requirements to be used in preclinical and clinical research;

g) gamma camera for small animals (gamma-probe);

h) tomography scanner for positrons emission used for small animals research –microPET.

i) Radiochemistry laboratories and radiobiology laboratory;

j) HPLC, with UV detection, radiodetection and fraction collector; sterile hoods, other radiochemistry/analytical equipments: FT-IR, GC-FID, AAS, IC, DLS.

2.3.28.3. The research area; Present status of research

The main directions of this interdisciplinary group are:

I. ***Design of novel radiopharmaceuticals for imaging (diagnosis and therapy follow-up)*** based on specific targets and biovectors; Radionuclide imaging modalities (positron emission tomography, PET; single photon emission computed tomography, SPECT) are diagnostic crosssectional imaging techniques that map the location and concentration of radiotracers, *in vivo*. PET and SPECT are became molecular imaging modalities as they are based on *radiotracers* and *molecular targets* to image, map and measure target site activities (e.g. angiogenesis, metabolism, apoptosis and proliferation). Improvement of scintigraphic tumor imaging is extensively determined by the development of more tumor specific radiopharmaceuticals. Thus, the overall objective of the group is to design new functional radiopharmaceuticals aiming to improve the differential diagnosis, prognosis, planning and monitoring of cancer treatment. In this context, reliable molecular imaging assays that assess (1) cellular targets at low cost, (2) treatment response more rapidly, (3) differential diagnosis, (4) the prediction of therapeutic response, and (5) better radiation dosimetry for internal radiotherapy would be very valuable. On-going studies include:

- developing of new F-18 PET tracers (beyond FDG) aimed for more specific tumor imaging, such as ^{18}F-FLT (fluorothymidine), ^{18}F-miso (fluoromisonidazole), ^{18}F-choline, ^{18}F-FES (fluoroestradiol);
- developing of Cu-64/67 tracers to study genetic diseases affecting copper metabolism and for tumor imaging and therapy;
- unconventional PET/SPECT tracers based on I-123/124 and Ga-68;
- ultra short-lived radionuclides for brain physiology and pathology studies.

II. ***Production / radiochemistry of "medical" radionuclides;*** Iodine-125 (60 d): cancer brachytherapy, deep vein thrombosis and radioimmuno-assays; Iodine-131 (8 d): treatment of thyroid cancer and imaging; Lutetium-177 (6.7 d), Rhenium-186 (3.8 d), Rhenium-188 (17 h): Samarium-153 (47 h): therapy/ imaging/follow-up and pain relief; Molybdenum-99 (66 h): used as the 'parent' in a generator to produce technetium-99m; Technetium-99m (6 h): imaging (skeleton, heart muscle, brain, thyroid, lungs, liver, spleen, kidney, gall bladder, bone marrow, salivary and lacrimal glands, heart blood pool, infection and numerous specialised medical studies);Yttrium-90 (64 h): brachytherapy and palliation; Bismuth-213 (46 min): targeted alpha therapy; Holmium-166 (26 h): diagnosis and treatment of liver tumours; positron emitters Fluorine-18 (110 min), Copper-64 (12.7 h), Iodine-124 (4.2 d), Gallium-68 (68 min), Carbon-11 (20.3 min), Nitrogen-13 (9.9 min), Oxygen-15 (2 min): PET imaging. Additionally, studies regarding cyclotron production of ^{99m}Tc to address ^{99}Mo shortage and alternative solution, as gel-generators, for obtaining ^{99m}Tc are envisaged.

III. ***Agents for targeted radiotherapy of cancer;*** Targeted radiotherapy (TRT), using internally emitted radiation, offers an alternative to the use of traditional radiation therapy. The key features of TRT include: (1) the ability to direct the agent to the target tissue using a biological marker using monoclonal antibodies or fragments (radioimmunotherapy,RIT) or specific peptides (peptide receptor radionuclide therapy, PRRT); (2) specific binding towards TAA (tumor associated antigens) or peptide receptors, overexpressed in tumor cells; (3) the deposition of high linear energy transfer radiation at the site in a short period of time; (4) induced chromosomal DNA damage, which then causes cell death. The studies of radiolabelled biovectors include: somatostatin analogues (TATE, TOC), neurotensin (agonists and antagonists) and growth factors (EGF) labeled with ^{177}Lu; antibodies labeled with ^{188}Re (antiVEGF, antiMUC1, antiCEA), micro- and nano-spheres labeled with ^{188}Re, labeled with ^{177}Lu, etc.

The team has an important contribution to mentioned research area in international and national projects: Eureka (E!3832 RADNUCLTHER, 2008-2011), IAEA Cordinated Research Projects (14551 2007-2010, 16500, 2010-2013), IAEA Technical Cooperation (ROM2010002, 2012-2014), COST (BM0607, Management Committee Member, 2008-2011), Bilateral Cooperations with Italy (Radiolabelling of specific biomolecules with therapeutic radionuclides. Chemical aspects, self radiolysis and scavenger's effect, 2006-2008; Radioactive Biomolecules for Imaging and Targeted Therapy of Cancer, 2006-2008), CEEX (26, 91, 5, 19, 36, 120), PNCDII (PNII 71-124, PNII 41-080, PNII 71-073, PNII 42-144, PNII 72-201).

Awards: 1st INCC Prize for the best presentation of a young scientist (2005) at International Nuclear Chemistry Congress (D. Niculae)

2.3.28.4. Beneficiaries

The successful research work (preclinical) is translated to GMP-production (small scale production line) and to clinical testing. At national level, there are about 40 Nuclear Medicine units which perform routinely investigations for diagnostic using radiopharmaceuticals and 3 major units which perform radiotherapy.

2.3.28.5. Human resources

The Radiopharmaceuticals Research Team was carefully built-up according to number of projects and recent developments. It is a multidisciplinary team, consisting in radiochemists, physicists, biophysicists and engineers. There is a good balance between senior and junior researchers, PhD and PhD students, experienced and young professionals.

References

Dana Niculae, Valeria Lungu, Rodica Anghel, Iuliana Gruia, Marina Iliescu, *J. Label Compd Radiopharm* 2010, **53**, 355-359

Dana Niculae, Valeria Lungu, Marina Iliescu and Diana Savu, *J. Label Compd Radiopharm* 2010, **53**, 275-279

Dana Niculae, Marina Iliescu, Ioana Patrascu, Radu Vasilache, Cosmin Mustaciosu, Gabriela Voicu and Mariana Purice, *J. Label Compd Radiopharm* 2010, **53**, 398-402

Valeria Lungu, Diana Chiper, Lidia Matei, Catalina Barna, Iuliana Gruia, Catalin Tuta, Cristian Postolache, Catalina Cimpeanu *J. Label Compd Radiopharm* 2010, **53**, 466-468

Valeria Lungu, Dana Niculae, Marieta Panait, Diana Chiper, *J. Label Compd Radiopharm* 2007, **50**, *489-491*

Valeria Lungu, Dana Niculae, Penelope Bouziotis, Ioannis Pirmettis, Corneliu Podina, *J Radioanal Nucl Chem*, 2007, **273**(3) 663 - 667

Valeria Lungu, Diana Chiper, Dana Niculae, *J. Label Compd Radiopharm*, 2007, **50**, 565-566

Valeria Lungu, Dana Niculae *J Label Compd Radiopharm*, 2007, **50**, 588-589

2.3.29. E-29: Tritium and Labelled Compounds Research Team. Activity Report (2007-2011)

2.3.29.1. Infrastructure

The Tritium and Labelled Compounds team develops researches in a modern laboratory refurbished using as support national researches projects (6 PNCDI II, Nucleus Projects) and Infrastructure project No 7 PM /29.X.2008 “Infrastructure Development for Research in Nuclear Physics and Related Field– IFIN-DIC/subproject C3 TRITIULAB” [2.3.32.1, 2].

The current laboratory contains modern equipments like: FTIR ATR spectrometer, Liquid Scintillation Counter, Tritium Manifold, Vacuum pumps, chromatograph radio-HPLC, scanner radio-TLC, Beta imager, Furnaces with digital controller, Rotary evaporators, High power chiller, Tritium monitors and new radiochemical hoods. The present infrastructure will be completed in 2012 (in infrastructure project No 7 PM /29.X.2008) with state of the art equipments: Tritium FT NMR Spectrometer and ESR spectrometer.

2.3.29.2. The research area; Present status of research

The research activity from the Tritium and Labelled Compounds Laboratory has a major role as a representative unit for interdisciplinary scientific research. The activities for development of research project can be divided in three major categories:

- Basic research - radiation chemistry and computational chemistry, biology;
- Synthesis - labelled compounds with radionuclides and applied radiometric methods in the life sciences fields (biology, pharmacology, health);
- Applied research - targeted to the field of global management of tritium (detection and dosimetry, tritium wastes, tritium facility designing and testing)

The team has an important contribution to mentioned research area and project management in the last years (5 PNCDI2, 3 CEEX national projects and 1 EURATOM-Fusion project), leading to:

- Publishing of 11 articles in “Fusion science and technology”, 9 articles in “Journal of Labelled Compounds and Radiopharmaceuticals”, 3 articles in “Journal of Radioanalytical and Nuclear Chemistry” and 2 articles in “Radiation Physics and Chemistry”,
- 2 national patents request,
- Obtaining of more than 30 new products and technology like: Labelled compounds with tritium; Experimental facilities for tritium wastes processing; Calibration stands for tritium gas monitors; Facility for endurance testing of isotope exchange catalysts; Computational method for evaluation of radiolytic effects in materials; Determination of radionuclide distribution in labelled compounds by EPR spectrometry; Determination of tritiated water activity using EPR spectrometer; Determination of tritium surface activity and radioactive concentration of labelled compounds solutions using plastic scintillators.

Awards:

- Complex Research-Development Projects First Prize awarded by Ministry of Education, Research and Youth-National Authority of Scientific Research- december-2007 for CEEX Project “*Treatment and conditioning of tritiated solid, organic liquid wastes and sealed sources with tritium resulted form Romanian nuclear activities*”
- Prize Best Poster Awards Chicago 2009 awarded by Wiley and Sons for scientific contribution *Synthesis Of Nucleoside Analogue E-275 Class By Isotope Exchange Technique, C.* Postolache, Lidia Matei, C. Tanase, George Bubueanu, *The 10-th International Symposium on The Synthesis and Applications of Isotopes and Isotopically Labelled Compounds Chicago, Illinois, USA, June, 14-18 2009* [3.2.32.5]

Today, Tritium and Labelled Compounds Laboratory is integrated in a large national research network. The structure of this network is shown in figure 1.

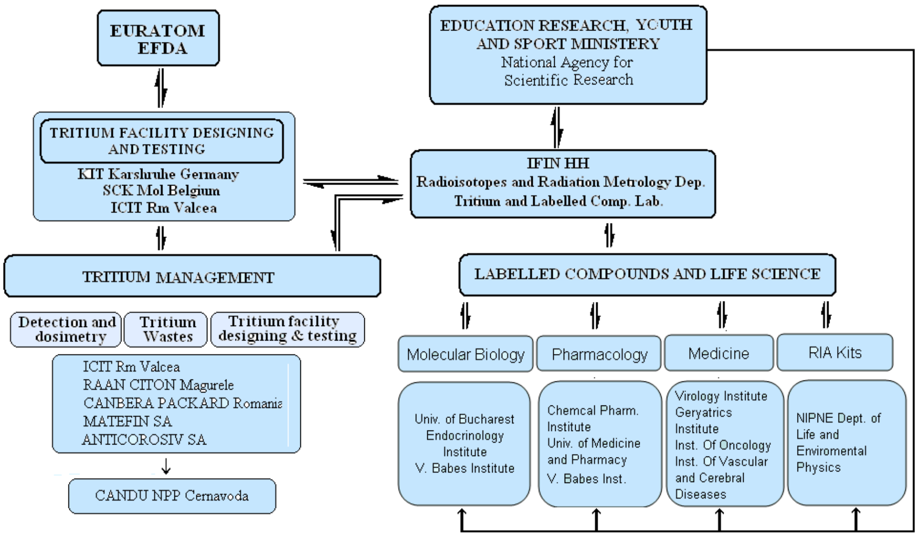


Figure 1. The tritium and labelled compounds research network structure

2.3.29.3. Beneficiaries

At national level, the most important user in the field of tritium management is represented by Cernavoda NPP, followed by ICIT Rm. Valcea and IFIN HH. Other endorsed users are the economic agents implied in activities with tritium as part of National Nuclear Program (ANTICOROSIV S.A, S.C MATEFIN, CANBERA PACKARD Romania, etc.)

Another priority targeted group is represented by the international partners involved in the Fusion Program (KIT, Karlsruhe Germany, SCK Mol Belgium, KINETRIX Canada, etc).

All the R&D units (INCD V Babes, INCD CCF Bucharest, Bucharest Oncology Institute, University of Bucharest, Carol Davila University of Health and Pharmacology, etc) which use the labelled compounds in researches focused on life sciences field also represents potentially users of obtained results.

2.3.29.4. Human resources

The Tritium and Labelled Compounds Laboratory scientific team was carefully built-up according to the presented researches fields.

Team leader, CS II with PhD in radiochemistry, has expertise in radiation chemistry, computational chemistry, synthesis of labelled compounds, applied of radiometric techniques in molecular biology and pharmacology, tritium detection and dosimetry, tritium wastes processing, tritium facility designing and endurance testing.

The expertise of team leader is completed with 1 young analytical chemist (CS PhD in analytical chemistry with competence in pharmacology and radio-pharmacy), 1 young biochemist (ACS, PhD student in agronomy), 1 organic chemistry engineer (IDT I PhD in organic chemistry with competence in radio-pharmacy), 1 inorganic chemistry engineer and 2 technicians (radiochemistry).

2.3.29.5. Final remarks

Romania is the only European country which develops the CANDU technology. After the Unit 1 and Unit 2 from NPP Cernavoda became operational and after investment finalization for Unit 3 and 4, Romania will become the most powerfully tritium source from Europe. For these reasons the global management of tritium represents an important component of National Nuclear Plan.

The development of international projects designed for EURATOM fusion program created the necessity of technological development in the fields such as: management of tritium wastes, new detection systems, tritium effect in materials. Today at European level, there are not any specific technologies elaborated which can be practically validated. Tritium and Labelled Compounds Laboratory from IFIN HH and ICSI Rm Valcea can become an important component in development of nuclear technologies designated to EURATOM –fusion projects.

The implementations of modern investigation radiometric techniques using labelled compounds will permit the accomplishment of the compatibility and competitively levels needed for integration of Romanian research units, focused on studies of biological processes at genetic, molecular, cells and tisular level, pharmacological studies, toxicological studies, pathology in the European research area.

References

C. Postolache, Lidia Matei, *Evaluation of fundamental processes in macromolecular structures radiolysis using quantum-chemical methods*, Radiation Physics and Chemistry, 76, 1267-1271 (2007)

Lidia Matei, C. Postolache, *Radiolysis of polytetrafluoroethylene and polystyrene catalytic supports in presence of tritiated water*, Radiation Physics and Chemistry 76 1257-1262 (2007)

Lidia Matei, C. Postolache *Tritium Laboratory with Multiple Purposes at NIPNE Magurele*, Fusion Science and Technology, 54, 149-152, (2008)

Lidia Matei, C Postolache, *Refurbishment of the Tritium Laboratory from NIPNE Romania*, Fusion Science and Technology, 60, 3, 1021-1024, (2011)

C. Postolache, Lidia Matei, C. Tanase, G. Bubueanu, *Synthesis Of E-275 Class Nucleoside Analogue By Isotope Exchange Technique*, J. Label Compd. Radiopharm. 53, 461-463, (2010)

C. Postolache, Rodica Georgescu, Lidia Matei, *Determination of Tritiated Water Activity Using EPR Spectrometry*, Fusion Science and Technology, 60, 3, 990-993, (2011)

C Postolache, L Matei, *Evaluation of unfixed tritium surface contamination*, Fusion Science and Technology , Volume 48, Issue 1, pages 413-415 (2005)

Lidia Matei, C. Postolache, C Tuta, S Brad, *Facility for Endurance Testing of Hydrophobic Isotope Exchange Catalysts*, Fusion Science and Technology, 60,No 4, 1419-1422 (2011)

2.3.30. E-30: Nuclear Methods in Condensed Matter Research (2007-2011)

2.3.30.1 Ion Beam Analysis - Elemental and structural analysis using microbeams

Nuclear microbeam facilities are analytical tools with high spatial resolution exploiting MeV ion beams. The interactions of beam particles with atoms and nuclei of the target induce the emission of characteristic radiation, whose energy provides signatures of the compositional and/or structural properties of the target. IBA (Ion Beam Analysis) techniques are based on the detection of such radiation, enabling the characterization of samples of interest, for material science, medicine, and environmental studies. External beams, obtained by extracting the particles beam into the atmosphere through a thin window have many attractive features, such as non-destructivity and ease of working. External microprobes have made possible to obtain probes in the micron range by adopting strong focusing lenses, ultra-thin windows for beam extraction, and short/ultra-short external path of beam particles in light gases; they have also made possible the use of external IBA techniques, such as RBS, ERDA, and STIM. External scanning microprobes and IBA techniques have enabled the characterization of samples with high spatial resolution, comparable with that achievable in-vacuum [2.3.34.1, 2.3.34.2].

Radiology and irradiation using X-ray and ion microbeams: A goal of research in radiobiology is to identify the radiation-sensitive target(s) in cells and characterize the mechanisms of damage and repair. To this end, a micro-beam of ionizing radiation (ions or X-rays) able to deliver a defined dose to individual cells or sub-units of cells is a useful tool. Low energy microfocus X-ray-generators are now commercially available, but only few of them are used in radiation biology experiments.

X-ray and ion microbeams are commonly used to study local irradiation effects in living cells, as it has been established that ion beam irradiations can lead to deleterious changes in cells that are not struck directly by the microbeam. Such changes, which take place over distances long compared to the size of the irradiation spot and for times long compared to the time of irradiation, are collectively termed Radiation-Induced Bystander Effect (RIBE). Free-radical chemistry is invoked to explain the RIBE, but no unified model is available at present.

Fast neutron irradiation and dosimetry: The neutron beam of the Cyclotron U-120 is generated by 13 MeV deuterons bombarding a thick beryllium target. The facility can be used for microdosimetric measurements inside and outside the useful beam. The dose fraction due to gamma rays is known. Another type of application consists in the irradiation of different materials with the scope to determine the hardness of these materials to the fast neutron.

Investigation of materials with X-rays and monochromatic gamma beam at ELI-NP: Extreme Light Infrastructure (ELI) will be the only European and International Centre for high-level research on ultra-high intensity laser, laser-matter interaction and secondary sources, having unparalleled possibilities. Its pulse peak power and briefness will go beyond the current state-of-the-art lasers by several orders of magnitude. Because of its unique properties, this multidisciplinary facility will provide magnificent new opportunities to study the fundamental processes unfolded during light-matter interaction.

The goal of **"Nuclear Physics with High-Power Lasers"** project is to prepare the nuclear physics experiments and applications based on laser-driven production of radiations of different types. Subjects such as the synthesis and investigation of neutron-rich nuclei of astrophysical interest around N=126 waiting-point, photonuclear reactions or material behavior under strong irradiations are foreseen to be studied. The preparation will consist~~s~~ mainly in designing and constructing the experimental instrumentation. To this end, simulations, theoretical estimates, tests and experiments to run high-power laser facilities will be performed.

At the same time, local teams of researchers specialized in such studies will be built; they will be deeply involved in collaborations with other laboratories performing similar and/or related studies. Thus, one can fully benefit from the increase in power and repetition rate available when ELI-NP will enter into operation. A full suite of instrumentation specific to nuclear physics, such as heavy ion electromagnetic separators and beta-decay, gamma and particle spectrometers, will be developed for the characterization and subsequent optimization of primary and secondary radiation resulting from high-power laser pulses interaction with targets. The large reaction chambers, hosting the focusing mirrors, need a flexible design to accommodate different configurations of incoming laser pulses and the coupling of various detection systems. Target systems adapted for the operation with high repetition high-power laser pulses will be developed; a laboratory specialized in the production of special targets (thin films, capillaries, etc) will be created.

2.3.30.2 Positron Annihilation Spectroscopy

Positron Annihilation Spectroscopy (PAS) can reveal useful information about the electronic and defect properties of materials. Positron Annihilation Lifetime Spectroscopy is based on the following phenomena: when a positron is injected into a polymeric medium, it thermalises and forms a quasi bound state with electron, namely positronium (Ps) atom. There are two type of Ps, *para*-Ps (*p*-Ps) and *ortho*-Ps (*o*-Ps), with life-times of 125 ps and 142 ns, respectively. Both, *p*-Ps and *o*-Ps undergo pick-off annihilation with surrounding electrons. This renders the life-time of *o*-Ps to a few nanoseconds while the *p*-Ps life-time remains practically unaffected due to its high intrinsic decay rate. The fate of *o*-Ps is monitored to obtain specific information about the free-volume structure of the polymer, because Ps has extreme sensitivity to holes or region of low electron density in the material where it is localized. So, the life-time measurements of Ps species provide information about the size of the free-volume holes.

Doppler-broadened annihilation radiation measurements provide information about the momentum distribution of electrons which is often represented by a shape parameter, namely, *S*-parameter, which is defined as the ratio of the central low momentum region to total peak area of the 511 keV photopeak. It is a sensitive index of the pore fraction in the polymeric material.

Coincidence Doppler Broadening Spectroscopy (CDBS) has the advantage - over single detector spectroscopy - that a lower background is present in the region of high longitudinal momentum of the annihilation pair electron-positron. These annihilations correspond to fast electrons, making CDBS method suitable for probing the chemical sensitivity in open (free) volumes trapping sites [2.3.34.3-2.3.34.4]. Many studies proved that Ps is a powerful porosimetric and chemical probe for exploring the adsorption, pore filling, porosity and surface properties of various systems [2.3.34.5-7]. To further enhance the capability of the Ps probe, it is necessary to deepen our understanding of its formation, diffusion, thermalization and annihilation, trying to make the predictions as quantitative as possible. Since the first application of PAS to porous materials, new materials have been synthesized and a number of novel applications have emerged. It is our hope that PAS will find wider applications in this rapidly and continuously developing field of science and technology.

Experiments with a High-Density Positronium Gas: A high-density gas of interacting positronium (Ps) atoms can be created by irradiating a thin film of nanoporous silica with intense positron bursts; the Ps lifetime can be measured using new single-shot technique.

Positronium physics (interaction with internal or external electromagnetic fields): The annihilation of *ortho*-Ps and *para*-Ps atoms is influenced by a magnetic field. This effect can be used for developing new experimental techniques for measuring the internal magnetic field and *ortho*-Ps interactions in internal and external magnetic fields.

Porous polymer films have attracted much attention due to their usefulness as supporting media in tissue engineering, membranes in separation process, templates for inorganic growth, dielectric materials for electronic devices and optical materials. Porous structures seen in the entire thickness direction, in addition to the two-dimensional top surface of the film become very important to control the desirable properties of porous films, such as cell grow rate, selectivity of membrane and effective refractive index of an optical film. Pore structure in polymer films has influence on the electrical and transport properties of the film. The growth in the interest of polymer thin films has also been catalyzed by the increase in the number of techniques available to characterize thin polymer films. From the engineering side, there are challenges that are faced in producing perfectly uniform thin films. Yet, this in turn has sparked the interest from the physics community in studies on instabilities in thin films and on the confinement of highly ordered structures. Controlling interfacial interactions has presented numerous challenges to surface chemists, both small molecule chemists and polymer chemists. The influence of confinement on phase transitions like crystallization, phase separation and micro phase separation, has piqued the interest of physicists and physical chemists.

2.3.30.3 Nuclear Activation Analysis (NAA) and Nanomaterials

In the new field of "Nanomaterials and Nanotechnologies" there are great efforts to develop new materials, as well as new technologies capable to extend our present performance and knowledge, with a great impact in biology, genetics and medicine.

Nanotechnologies led to a growing market, characterized by Engineered NanoParticles (ENPs) that found widespread applications. These applications include ENPs in a wide variety of consumer products – from cosmetics to medical applications. However, it is already known that most part of the ENPs presents a certain (variable) degree of toxicity - a „hot" topic around the world. There is a relationship between the metal properties and the toxic effects. Studies developed for such effects are hampered by the lack of tools to localize and quantify ENPs in water, sediments, soils, organisms. NAA studies of waters and soils may be of the great usefulness for the identification of spontaneous dispersal of radioactive ENPs into water and soil, successfully passing through filters. The applicability of the NAA technique has already been demonstrated in this type of applications in several published studies. On the other hand, NAA technique, coupled with SEM (Scanning Electron Microscopy) and TEM (Transmission Electron Microscopy) may be of great usefulness to study new materials, including nanomaterials or nanostructures produced for future applications in nuclear power plants. In the field of medical applications, nano-particles from drugs can be absorbed into the bloodstream; their tracks and localization must be known and controlled.

NAA coupled with gamma-ray spectroscopy [2.3.34.8-10] may be applied to radioprotection ~~as~~ studies of „non-targeted-effects" under radiation - bystander effects, abscopal effects, systemic reactions and hormesis, by using IFIN- HH facilities (Cyclotron) and a powerful TEM system; it can be also applied in the study of materials modifications under heavy ions and laser beams impact.

References

2.3.34.1 D. Dudu, O. Muresan et al, J. of Optoelectronics and Adv. Materials **10** (2008) 3516
2.3.34.2 D. Dudu, O. Muresan et al., Surface&Coatings Technology **202** (2008) 2384
2.3.34.3 P.M.Racolta, L.Craciun,C.Ionescu, et al, AIP Conference Proceedings **1099** (2009) 960
2.3.34.4 F. Constantin, E. Barna, M. Straticiuc et al, Dig J Nanomater Bios **6** (2011) 543
2.3.34.5 I. Vata, D. Dudu, E. Ivanov, I. Rusen et al, Applied Surface Science **255** (2008) 194
2.3.34.6 E.Ivanov, I.Vata, S.Toderian, I. Rusen et al, Nucl Instrum Meth B **267** (2009) 347
2.3.34.7 E. Ivanov, I. Vata, D. Dudu , I. Rusen et al, Applied Surface Science **255** (2008) 179
2.3.34.8 Em Cincu, L. Craciun, I.Grigore, et al, Appl Radiat Isotopes **67** (2009) 2133
2.3.34.9 Em. Cincu, I. Grigore, D. Barbos et al, AIP Conference Proceedings, **1036** (2008) 67
2.3.34.10 Em. Cincu, I. Manea, V. Manu, O. Sima et al, J Radioanal Nucl. Ch **274** (2007) 199

2.3.31. E-31: Radiation Detection Instrumentation (2007-2011)

Special detection systems for highly dedicated experiments has been designed and developed; consistent developments are in process and can be realized: Weber's type neutrinos and antineutrinos detector; portable gamma ray spectrometer associated with GPS and internet; high energy particles detection systems for collaborations with JINR-Dubna, LPC-Caen, LNF-Catania and IPN- Orsay.

2.3.31.1 Reactor neutrino detection for nuclear reactor survey

In order to monitor the operational status, power levels and fissile content of a nuclear reactor in real time, a modern detection system based on antineutrinos detection generated in the fission reaction has been designed and developed. For the new reactor generation with bigger power the system is of high importance. The device was realized by the little volume type the detection system of little volume type "torsion balance with sapphire crystal" which can check, from distance the dynamic of reactor [2.3.35.1], [2.3.35.6]. The experimental tests of torsion balance was be done in underground of Department of Life and Environmental Science and was put in evidence the diurnal effect of solar neutrinos. With this results we establish the detection parameters of torsion balance, expressed by deviation angle of balance disc in function of initial position. The results was presented in two international Conference (The XXIII international Conference on neutrino physics and astrophysics, Christchurch, New Zealand, and The XXIV international conference on neutrino physics and astrophysics) and two review article. We had are doing the calibration of balance in different condition of operations. For the checking of fuel cycle and storage we can realize a detector system, capable to discriminate between gamma radiation and neutrons after the pulse shape, establishing the activity level of fuel in storage or at the recycling process.

2.3.31.2 Portable gamma ray spectrometer

Hand held gamma monitors associated with GPS and internet could be useful for outdoor measurements both in normal and accidental situations.

Researches will be performed for

- Detector elements and detection scintillation probes using plastic scintillators and photomultipliers for X and gamma ray to monitoring monochromatic beam at ELI-NP;
- Dosimeters for huge and very short radiation pulses generated at ELI-NP;
- Time and height spectrometer systems to be used at ELI-NP;
- Detector element with CsI(Tl) scintillation cystals coupled at PIN photodiode.

The results of this experimental research was finalized by experimental model of portable spectrometer and prototype applied in the centre of nuclear fuel storage and social institution for radioactive monitoring of personal. Scientific results was disseminate into review article in Romanian Report in Physics 2011.

2.3.31.3 New detectors for international large scale experiments

Researches will be performed in order to develop detector elements and detection systems using organic and inorganic scintillators, resistive plate counter (RPC). In the frame of this activity was developing researches to obtain the detector elements for detection systems of new conception, using unorganic scintillators of type CsI(Tl) of high thallium concentration coupled at PIN photodiodes which to be used in physics experiment with heavy ions for to particle identification after A and Z. The experiment where was applied this type of detector elements is FAZIA experiment (Four pi A and Z identifications array) because the energy resolution and detection efficiency are much better in the case of other detector elements with scintillators and photomultipliers [2.3.35.8].

Another application of this type of detector have been the magnetic spectrometer for relativistic electrons developed at Vexler and Baldin Laboratory for High Energy Physics, JINR, Dubna. The detector element operate like E, ΔE detector and it detect the relativistic electrons in energy domain 0,1keV – 20 MeV. The spectrometer operate at acceleration line of NUCLOTRON.

A sophisticated position sensitive detector has been realized for the SPHERE experiment at NUCLOTRON in JINR-Dubna. The detector have the cylindrical geometry with inner diameter of

100mm and external diameter 130mm, having the length of 1000mm. In the structure of detector come 36 scintillation element from plastic scintillator type BC 430 coupled at PIN photodiode at both ends [2.3.35.7].

The RPC detectors developed in Department of applied physics was realized for new detection facilities at NUCLOTRON in JINR-Dubna, like position sensitive detectors. They have the time and spatial resolution very good (96 ns time resolution, respectively, 1mm spatial resolution) and detection efficiency in mips regime of 98%. A very important applications of this type of detector was NICA MPD experiment in JINR-Dubna.

A very important research activity was developed in the domain of monitoring the beam at particle accelerators. For this task we did experimental tests on plastic scintillation materials to determinate the detection characteristic at fast neutrons and to establish the level of gamma neutrons discrimination. For this we have used the scintillation materials type BC408 coupled at photomultiplier Hamamatsu. The scintillation probe realization in DFNA was tested at X, gamma and fast neutrons in IFIN-HH and IPN Orsay-France. The results obtained in this tests confirm us the requested imposed of this type of experiment and that result actually is found in production a number of 36 items for the Accelerator GANIL-Caen, France.

We have focusing this experiments in cooperation at JINR-Dubna, Russia (detector E, ΔE for the spectrometer of relativistic electrons generated in interaction at NUCLOTRON) and Fazia in the cooperation with LPC-Caen, SPIRAL2, LNF-Catania because was requested of our international partner .

2.3.31.4 Spontaneous parametric down conversion twin photon beams producing and measuring setup

The quantum photon pairs, generated by spontaneous down conversion phenomenon, promise a lot of applications. That's why, a setup including both producing and measuring instrumentation for quantum correlated pairs was designed and manufactured in our department, and, for the first time, in Romania.

A violet beam supplied by a laser diode is focalized on a nonlinear crystal (barium beta borat). When the optical axe and the beam direction angle is properly tuned, some laser photons decay in quantum correlated pairs, by type II spontaneous down conversion phenomenon. Noncolinear and beamlike cases were obtained.

The single photon detector, direct coincidence and counting system measures visible and near infrared radiation having the wavelength between 400 nm and 1000 nm. The minimum detectable limit is as small as 100 photons/s for a measuring time no longer than 8s.

The main scientific and technical results were disseminated by two scientific communications and four published articles [2.3.35.9.-12].

The spontaneous parametric down conversion twin photon beams producing and measuring setup is ready both for experimental studies and research and development activities.

A project proposal concerning quantum cryptography and communications with quantum correlated photons is ready to apply with.

References

2.3.35.1 I.Cruceru, G.Nicolescu, Octavian Duliu, INT J MOD PHYS A, **23**, (2008) 1719
2.3.35.2 M. Petrascu, A. Constantinescu, I. Cruceru, et al., Nuclear Physics A **790 (**2007) 235
2.3.35.3 LHCb collaboration, F.Constantin, Phys.Lett.B **698** (2010) 115
2.3.35.4 LHCb collaboration, F.Constantin, Phys.Lett.B **698** (2011) 11
2.3.35.5 LHCb collaboration, F.Constantin, Phys.Lett.B **694** (2010) 209
2.3.35.6 M. Cruceru, G. Nicolescu, O. G. Duliu, I. Cruceru, INT J MOD PHYS A, **26** (2011) 2773
2.3.35.7 M.Cruceru, D.Bartos, I.Cruceru et al., Rom. Rep. in Phys., **61** (2009) 513
2.3.35.8 M.Cruceru, O.G.Duliu, I.Cruceru, Rom. Rep. in Phys., **63** (2011) 693
2.3.35.9 D. B. Ion, M. L. Ion, L. Rusu, Optics Communications, **283**, (2010), 1026
2.3.35.10 D. B. Ion, M. L. D. Ion, L. Rusu, Rom. Rep. in Phys. **60**, (2008), 1151
2.3.35.11 D. B. Ion, M. L. D. Ion, L. Rusu, Rom. Rep. in Phys, **61**, (2009), 609
2.3.35.12 Al. Rusu, L. Rusu, Journal of Science and Arts, **1(12)**, (2010.), 143

2.3.32. E-32: Archaeometry and Cultural Heritage (2007-2011)

2.3.36.1. Introduction

Archaeometry is a well-established interdisciplinary research field, using a wide palette of scientific methods for the characterization of art and archaeological objects. Archaeometry has witnessed a large development during the last few years, when all over the world research groups have intensified their efforts in applying the knowledge acquired in natural sciences to the extensive domain of Cultural Heritage (CH). Remarkable contributions to the preservation of the CH were also brought by the involvements of the exact sciences (physics, chemistry, biology) in a field, which in the past was exclusively reserved for archaeologists and historians only.

2.3.32.2. Tomgraphy in Archaeometry

X-ray Computed Tomography (CT) is a widely spread non-destructive examination technique used in various applications, such as medicine, industry, material science, cultural heritage. The most often encountered kind of tomographic measurements are the ones in transmission mode, in which the attenuated X-ray photons are measured. They provide maps of the absorption coefficient of transversal slices of the examined object, which, in turn, can be related to variations in density of the analyzed sample.

The structure of a tomographic device depends on the application in which the apparatus is to be used. The spatial resolution and maximum size of the object that is to be scanned are crucial when deciding to develop such equipment.The performance of a tomographic device in terms of spatial and contrast resolution (the last parameter corresponding to differences of contiguous materials in terms of absorption coefficient) essentially depends on the characteristic of the X-ray beam and of the X-ray detector.The technique of Computed Tomography (CT) combined with the pertinent interpretation of the obtained images is a powerful diagnostic tool which can provide details on the internal structure of a large class of objects, being nowadays largely employed in medical, industrial, material science and art work investigations.

In the frame of the CEEX-05 - “Tomography in archaeometry” project (2005-2008), we constructed an X-ray tomograph device, unique in our country, for the imaging of relatively low-Z materials artifacts (e.g. ceramics items). We already used this dedicated apparatus and its associated software to analyze some Eneolithic clay artifacts containing smaller inner objects [2.3.36.1].

The tomographic scans led to relatively good quality reconstructed images of the investigated objects, images obtained in a short time and with a spatial resolution that is more than satisfactory for the purposes of such studies. Thus, by using this tomographic device, hidden structural details that otherwise would have had remained completely unknown to the archaeologists were revealed inside the investigated objects.

2.3.32.3. Ion Beam analysis and X-Ray Fluorescence methods

In the frame of archaeometrical research using nuclear and atomic analytical methods as Ion Beam Analysis (IBA), X-Ray Fluorescence (XRF) and Synchrotron Radiation X-Ray Fluorescence (SR-XRF) two directions will be developed: archaeometallurgy and archaeological geology.

In archaeometallurgy, the composition of ancient artifacts – mainly gold, silver and copper-bronze – is studied, from elemental analysis to layers structure techniques as gilding and silvering. These aspects are essential for authentication – provenance studies on valuable Cultural Heritage items – jewelry, coins, adornments, toreutics, weapons and other museum objects.

For archaeological geology the goal is to characterize minerals sources (mines, placers, geological deposits) for metals, gemstones, obsidian, inorganic pigments and to compare them with the similar materials used in artifacts – gold, silver, copper, lead, obsidian, garnets, rubies, ceramics pigments in order to obtain provenance information – ancient workshops, technologies, long-range trade routes, historical commercial and military aspects.

Studies on painted art objects – pictures, icons, wood sculptures, manuscripts, etc – will be also started for authentication/provenance conclusions.

For all the Cultural Heritage artifacts the problem of forgery detection (authentication) is essential.

The totally non-destructive analytical methods used will be XRF – especially portable and micro-spot equipment, Particle Induced X-ray Emission (PIXE) – especially the micro-PIXE investigation (micrometric beam of protons for micro-structural investigations), Synchrotron Radiation X-Ray Fluorescence (SR-XRF) – especially the micro-SR-XRF procedure. A new non-invasive (only micrograms of sampling needed) method – LA-ICPMS will be also used for trace elements detection down to the ppb level.

Our Institute has remarkable scientific results in the field, internationally recognized through scientific publications, as:

- authentication of the famous twelve gold Dacian bracelets [2.3.36.2] recovered from the antiquities black market through a Police International Cooperation have been performed in our Institute – XRF analysis and in collaboration with Louvre Laboratory (AGLAE accelerator) – micro-PIXE analysis [2.3.36.7], INFN- LNL Legnaro (Italy), Dresden Forschungszentrum (Germany) [2.3.36.4], BESSY (Berlin) and ANKA (Karlsruhe) Synchrotrons – micro-SR-XRF analysis [2.3.36.3, 8].
- authentication of 137 gold Dacian coins (“Koson”- type staters) using the same methods [2.3.36.11].
- characterization of Transylvanian native gold (supposed to be used by Dacians) geological samples [2.3.36.5, 2.3.36.10].
- characterization of mineral pigments used for prehistoric Neolithic Cucuteni culture’s ceramics using XRF and Synchrotron X-Ray Diffraction [2.3.36.6].

The experiments were performed using various European Union projects for international cooperation as:

- CHARISMA - Cultural Heritage Advanced Research Infrastructures: experiments with micro-PIXE at Louvre Laboratory (AGLAE accelerator) and ATOMKI – Debrecen (Hungary).
- TARI Transnational Access to Research Infrastructure: experiments with micro-PIXE at INFN- LNL Legnaro (Italy) – 2003–2008.
- ENSAR European Nuclear Science and Applications Research: experiments with micro-PIXE at INFN- LNL Legnaro (Italy) from 2011.
- ELISA European Light Sources Activities: experiments with micro-SR-XRF at BESSY (Berlin) and ANKA (Karlsruhe) Synchrotrons.

The group was also involved in three European Union COST Actions: G1 "Ion beams in art and archaeology" (1995-2000), G8 “Non-destructive analysis and testing of museum objects” (2001-2006), and IE0601 “Wood in Cultural Heritage” (2007-), its leader being Romanian Representative in the Management Committees.

This type of research demands multidisciplinary teams – physicists, chemists, archaeologists, geologists, conservators, art experts, both in the frame of the Institute and in institutional networks (physical research units, museums, universities, art & archaeology institutes).

References

2.3.36.1. F. Constantin, C. Pavel, R. Bugoiet al., Nucl Instrum Meth A**621** (2010) 685

2.3.36.2. B. Constantinescu, E. Oberlaender-Tarnoveanu, R. Bugoi, V. Cojocaru and M. Radtke, Antiquity Journal **84(326)** (2010) 1028

2.3.36.3. B. Constantinescu, R. Bugoi, V. Cojocaru, R. Simon, D. Grambole, F. Munnik and E. Oberlaender-Tarnoveanu, Spectrochimica Acta Part B **64(11)** (2009) 1198

2.3.36.4. A. Vasilescu, B. Constantinescu, R. et al., Nucl Instrum Meth B **267(12)** (2009) 2233

2.3.36.5. R. Bugoi, B. Constantinescu, et al., Nucl Instrum Meth B **562** (2008) 2316

2.3.36.6. R. Bugoi, E. Pantos, B. Constantinescu and D. Popovici, Powder Diffraction **23(3)** (2008) 195

2.3.36.7. B. Constantinescu, R. Bugoi, et al, Nucl Instrum Meth B **562** (2008) 2325

2.3.36.8. B. Constantinescu, A. Vasilescu, M. Radtke and U. Reinholz, Applied Physics A **99(2)** (2010) 383

2.3.36.9. B. Constantinescu, R. Bugoi, P. Ioan, E. R Hodgson and R. Villa, Journal of Nuclear Materials **367** (2007) 1048

2.3.36.10. A. Neacşu, G. C. Popescu, B. Constantinescu, A.Vasilescu and D.Ceccato, Carpathian Journal of Earth and Environmental Sciences, **4(1)** (2009) 49

2.3.36.11. B. Constantinescu, A. Vasilescu, M.Radtke and U. Reinholz, Journal of Analytical Atomic Spectrometry, **26** (2011) 917

2.3.33. E-33: Accelerator Mass Spectrometry - AMS (2007-2011)

2.3.33.1 Introduction

The Accelerator Mass Spectrometry (AMS) is a modern analyzing method that has the highest analyzing sensitivity known today, which is 10^{-16} (ratio: isotope/element). This sensitivity is equivalent to the real possibility to select and register one single type of atom from one million of billions atoms of other types. Such facilities are working all over the world in developed countries bringing important benefits to our life and knowledge on our planet.

2.3.33.2 Studies in Bucharest

The AMS laboratory of IFIN HH has a ten years experience in performing sensitive analysis for ***Nuclear physics*** measuring of nuclear cross sections of transmutation reactions, for ***Environmental physics*** detection of the attendant effects of routine nuclear releases from nuclear facilities, for the ***Atmospheric physics*** the characterisation of stratosphere-troposphere exchange processes and determination of the fall out of cosmogenic produced isotopes, for ***Nuclear fusion experiments and Tokamak reactors*** measurements for diagnose of the plasma confinement, plasma heating, Neutral Beam supplementary heating and its interactions with the plasma, for the divertor ensemble the inventories of particle accumulation and spatial distribution on the protection tiles, rapid inter-comparison of detritiation techniques based on Laser beam, for the investigation of hydrogen retention in special materials devoted to nuclear facilities [2.3.37.1]. Other AMS analyses were performed to establish the content of ^{11}B and ^{10}Be in special carbon materials.

The AMS facility was constructed at the 9 MV-HVEC-FN15 tandem accelerator in Bucharest. It consists of an ion injector deck, the accelerator, a Wien velocity filter and the ion detection system. The injector deck was recently upgraded and a new ion source form NEC (40 sample MC-SNICS) was introduced. For ions of different mass range the AMS facility has three detection systems: a detector array of three sequential PIN diodes, a gas filled Bragg-ionization chamber and an E-DE gas field Bragg detector with TOF [2.3.37.2].

In accordance with the Key Issues for Environmental applications of NuPECC LRP 2010, in the near future a new and more compact AMS system, based on a 1.0 MEV tandetron, will be installed in Bucharest. It will open the possibility of measurement of heavier log-lived isotopes (up to ^{240}Pu) and to extend the applications performed until now. It is envisagement to expand the present applications and to start new and important AMS researches as will be listed below.

For pharmaceutical products: AMS with ^{26}Al and ^{14}C will be used for fast validation of new products. The high sensitivity of AMS for ^{26}Al and ^{14}C detection permits a new approach in the research of new products concerning their metabolism and kinetics. The extremely small quantities (micro dosing) of substances labelled with ^{26}Al or ^{14}C will shorten the duration of the testing procedures by about 50%. In the USA this is already a common employed procedure.

Medicine: AMS with ^{26}Al will be used to study the bio-kinetics of Al and Al compounds and adjutants. Such investigations will be carried out in cooperation with medical clinics.

Earth, Climate and Environment: AMS with ^{36}Cl, ^{26}Al and ^{10}Be will be used to measure the erosion rates of rocks and of the Earth’s crust, lake sediments etc. The use of the cosmogenic produced radionuclides (^{36}Cl, ^{10}Be, ^{26}Al), measured by AMS in different compartments of the environment makes possible to obtain data about climatic changes and atmospheric exchange processes. Similar studies were performed by our laboratory in the past and there exists a data base of interpretation models and the associated computer codes.

Nuclear pollution: It is our future aim to establish an international scientific network with the task to monitor and prevent nuclear activities having negative impact on the environment and human health. The nuclear monitoring activity will extend over a large geographical area

(Europe, Asia, Africa, South America and Antarctica). Therefore, the general level of nuclear pollution in water, soil and air, will be monitored. A reconstruction of the modern history of nuclear contamination will be also established.. The following isotopes will be measured by AMS in the environment; ^{3}H, ^{129}I, ^{239}Pu, ^{240}Pu. The partners that already accepted the participation to the net work: NIPNE Romania, Technical University Munich, Germany, Comision Nacional de Energia Atomica, TANDAR Laboratory, Argentina, St. Petersburg State Polytechnic, Russian Federation and University Mugla Turkey.

Fusion Energy production: Envisioning the future International Experimental Fusion Reactor (ITER), special interest is paid to the AMS depth profiling measurement of Tritium and Deuterium. Introduced as gas or produced by the DD fusion reaction, Tritium is partially deposited in the protection tiles of the vessel walls of the Tokamak. Since in a Tokamak, the energetic Tritium is released from the DD reaction with 1.1 MeV depth measurements of T concentration provide interesting information about the kinematics of the plasma particle inside the fusion reactor. AMS is able to characterize the plasma confinement and stability, the quality of neutral beam injector and its perturbing interaction produced on the plasma confinement. It localizes the plasma disruption phenomenon and provides the dosimetry of the energetic tritium in the Tokamak. For the divertor assembly it determines the efficiency of the magnetic field by eliminating the low energetic particles that contribute to the heat dissipation. Furthermore, AMS is able to perform a rapid and sensitive comparison of the remnant T content in various PFC materials after the application of laser detritiation techniques [2.3.37.3]. All these applications will be continued in the future and are requested by the JET EFDA association.

Last but not least the new AMS facility will be able to perform measurements of actinides and participate in the international network of detecting undeclared nuclear facilities or illicit traffic of nuclear materials. The ratio $^{240}Pu/^{239}Pu$ is a good fingerprint to detect weapon nuclear reactors [2.3.37.4].

References

2.3.37.1 M. Dogaru, M. A. Calin and C. Stan-Sion, Journal of Radioanalytical and Nuclear Chemistry **288** (2011) 491.

2.3.37.2 C. Stan-Sion, M. Enachescu, O. Constantinescu and M. Dogaru, Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms **268 (**2010) 863.

2.3.37.3 C. Stan-Sion, J. Roth, K. Krieger, M. Enachescu, K. Ertl, V. Lazarev, H. Reithmeier and E. Nolte, Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms **259** (2007) 694.

2.3.37.4 C.Stan-Sion, M. Enachescu, M.S. Dogaru, New Techniques for the Detection of Nuclear and Radioactive Agents, Springer (2008) 27.

2.3.34. E-34: RASM Research Team Activity Report (2007-2011)

2.3.34.1. Introduction

IRASM research team is the research team of IRASM Department of the “Horia Hulubei” National Institute of Research and Development for Physics and Nuclear Engineering (www.nipne.ro). Its main subject of research is the technological irradiations with applications in medicine, agriculture and food, industry, environment and society.

The core research facility of the IRASM Department is the multipurpose gamma irradiation facility (Co-60) built under of a Technical Co-operation Project (1994-2000) between the Romanian Government and the International Atomic Energy Agency (www.irasm.ro). This kind of irradiation facility is unique in Romania and constitutes a national centre of technological irradiations.

By its features, the technological irradiations or radiation processing illustrate in an exemplary manner the final and most honorable role of science - to assist human society in its progress, also the pragmatic, concrete way from basic science to useful services and products. This happens because radiation processing is a domain placed at a triple border:
- the border between basic science and applied science;
- the border between a linear development of any single science and a synergic development in the frame of a multidisciplinary approach.
- the border between nuclear physics and nuclear engineering;

Most of researches and applications of radiation processing are multidisciplinary and address to:
- medicine: effects of irradiation on biological systems, sterilization of medical devices and pharmaceuticals, irradiation of tissues and blood;
- agriculture and food industry: food decontamination and disinfestation, sprout inhibition, sterile insect technique, sterilization of hospital meals for imunodeficient patients and of food for military and astronauts, genetic modification of plants;
- industry: modification of materials’ properties by radiation-induced polymerization, grafting, crosslinking, controlled degradation etc;
- environment: treatment of chemical pollutants from flue gases, waste water and sewage sludge;
- society: preservation and consolidation of cultural heritage artifacts (wood, paper, leather etc).

To act in such a vast area IRASM became a radiation processing center including laboratories for microbiological, physical and chemical tests. Testing labs and irradiation facility synergically act to determine a real implementation of radiation processing applications. The development of important relations with industrial companies is the most specific characteristic of IRASM department / radiation processing center, well reflected in department research services.

2.3.34.2. Present status of activity of IRASM Research Team

Even it is only 10 years old, during the last 4 years, the IRASM research team has been involved in many and wide activities. Some of the most important are:
- sterilization of medical devices, pharmaceuticals and cosmetics;
- studies on validation of sterilization by irradiation;

- food decontamination and detection of irradiated foodstuffs;
- irradiation treatment of waste water and sewage sludge;
- preservation and consolidation of cultural heritage artifacts (wood and paper);
- thermoluminescence and optically stimulated luminescence dating;
- radiation-induced modification of materials' properties.

National research projects at which IRASM team has been involved are:
- Physical and chemical analysis of product qualification for the treatment with ionizing radiation
- A chance for the archives future: disinfestation by ionizing radiation treatment
- Cultural heritage conservation through salvation intervention treatments at big volumes. Study with special orientation on the decontamination through gamma irradiation of wooden polychrome heritage
- Prestige and power. Nonmetalic adornment objects from Romanian museums, with an archaeometric study for the determination of the origin of amber beadwork
- Vibrational spectroscopy with Fourier transform used for painting pigments characterization: a chance for the authentification of Romanian paintings
- Cultural heritage authetification and dating through thermoluminescence and optically stimulated luminescence
- Microbial inoculants for systems of durable agriculture
- Development of the laboratory for detection of irradiated foodstuffs
- National synthesis on monitoring of foodstuffs treated by ionizing radiation
- Integrated system for limitation of damages produced by pathogene bacteria through the utilization of antagonistic microorganisms
- Multifunctional technologic system of feeding and utilization of useful insects
- Multiparametrical characterization of food security – analytical and toxicological methods
- New technological concepts on development of nanomaterials with low impact on environment
- Advanced biomaterials, with variable geometry and biofunctionality control, for general surgery and systematic and/or neurologic therapies
- Impregnate cotton gauges with triglycerides and nanoparticles of ZnO doped with Ag for the treatment of wounds with suprainfection risk
- Cell response as means in translational science. Drug design through antitumoral cell mechanisms induced by physiological complexes of tranzition bivalent metals
- Advanced photonic systems for processes control.

International research projects at which the IRASM team has been involved are:
- International Atomic Energy Agency (IAEA) TC Project RER/8/015 - Using Nuclear Techniques for the Characterization and Preservation of Cultural heritage Artefacts in the European Region
- IAEA TC Project RER/8/017 - Enhancing Quality Control Methods and Procedures for Radiation Technology
- IAEA TC Project RER/1/006 – Nuclear Tehniques for the Protection of Cultural Heritage Artefacts in the Mediteranean Region
- IAEA TC Project RER/8/010 – Quality Control Methods and Procedures for Radiation Technology
- IAEA TC Project ROM/8/015 - Implementation of Quality Assurance and Quality Control Systems at Radiation Processing Plants
- IAEA TC Project ROM/8/016 - Establishing a Demonstration Pilot Plant for Treatment of Sweage Sludge Using Radiation Processing Technology

- IAEA CRP 1539/F23029 - Radiation Treatment of Wastewater for Reuse with Particular Focus on Wastewaters Containing Organic Pollutants
- FP7 COST Action IE0601 - Wood Science for Conservation of Cultural Heritage.

The scientific activity of IRASM team during the last 4 years can be summarized in 34 papers published in ISI journals, 6 papers published in international conference proceedings, one published book, two submissions for patent acts, participation at many international and national conferences.

Our scientific activity has been also disseminated through mass media by many contributions at Romanian newspapers, journals and radio broadcasts, 3 scientific documentary films about the activity of IRASM and an interview required by IAEA press office.

During the last 4 years, under different IAEA international projects, IRASM team has organized 3 international workshops and 2 international training schools, and hosted 2 scientific fellowships and many short scientific visits in the field of technological irradiations. In the same time, IRASM team members have participated at different activities organized by foreign scientific institutions under IAEA and FP7 COST international projects.

The unicity statute in Romania of the irradiation facility makes IRASM radiation processing center to be recognized by the National Authority for Scientific Reasearch as facility of national importance. In this line IRASM collaborates with all interested organizations (public or private) offering them the appropriate help (expertise, consultance and/or services) in the field.

During the last 4 years many museums (Cotroceni, Aman, Severeanu etc.), churches (Izvoarele, Manastirea Dintrun Lemn etc.), libraries (Nationala, Judeteana Braila etc.) and other institutions (IFIN-HH, ICPE, IPM etc.) have asked for IRASM help for decontamination and disinfestation of cultural heritage objects (wooden, paper, leather, hay objects) and of archives.

The public authorities from Ministries of Agriculture (Institute of Hygiene and Veterinary Public Health) and of Health (Public Health Insitute and Public Health County Directions) have close collaborated with IRASM in the domain of food irradiation and detection of irradiated foods. IRASM has provided consultancy and help in understanding and controling of the domain related issues.

Since 2008 the IRASM research team has carried out 10 studies of validation of sterilization by irradiation of different samples (teeth implants, compresses, surgery thread, cotton-wool). There were also done 5 characterization studies on bilogical, resin and painting samples.

The human resources of IRASM team increased by 50% in the last 4 years, from 16 persons in 2007 to 24 persons in 2011. The main growth is given by the growth in the number of scientists, from 7 senior scientists in 2007 to 11 in 2011. From the 16 persons with higher education, 12 are young scientists (<35 years old). From 2 Ph.D. holders in 2007, today we have in our team 5 Ph.D. holders. During the last 4 years, 2 persons from IRASM team finished their doctoral studies and 4 their masteral studies. Today 7 colleagues find themselves in different stages of the doctoral studies and 1 in masteral studies. Two of them suppose to officially present the Ph.D. theses this year.

2.3.35. E-35: Techniques and technologies for management of radioactive wastes

2.3.35.1. Radioactive waste management

The objective of radioactive waste management is to deal with radioactive waste in a manner that protects human health and the environment now and in the future without imposing undue burdens on future generations. ***Storage*** of waste packages is a specific stage of waste management, which could be very long and challenge management systems. Extensive technical research is required in the preparatory phase in order to minimize surface contamination and surface dose rates meet requirements; the intended movements of waste packages within the storage facility can be performed safely, preclude inadvertent criticality, and minimize occupational exposures; and, obvious, procedures are in place for monitoring the integrity of waste packages, controlling, maintaining surveillance of the operational status of accident detection and mitigation equipment and ensuring that waste packages can be easily identified, located and accessed. ***Disposal*** is the best solution but involves a variety of technical and management issues, and can extend over a very long time (e.g., potentially hundreds of years). Therefore, the disposal decision is based on several consideration involved in assessing and demonstrating safety and environmental protection (e.g. site evaluation, facility design, environmental impact assessment, authorization processes, establishment of waste acceptance criteria, planned and systematic methods for waste inspection and emplacement, operational data collection, facility monitoring and surveillance systems).

Therefore, special arrangements for the management of radioactive waste are necessary because of the radiological hazards associated with it. The preferred strategy is to contain the waste (i.e. to confine the radionuclides within the waste matrix, the packaging and the disposal facility) and to isolate it from the immediate environment in which humans live. Radioactive waste management therefore consists of collecting the radioactive waste, processing it into a form that can be stored safely, and then storing it, pending its final disposal, in surface or geological repositories.The generation of radioactive waste and the subsequent need to manage it, is one of the implications, and learning from past experience, greater emphasis should be given to planning for the minimization of waste generation and optimization of its management, as well as for its financing. In doing this, the whole life cycle of radioactive waste, starting with generation and ending with its emplacement in a repository, needs to be considered.

An important aspect of radioactive waste management is the timescales that have to be considered for some of this waste. Human and environmental protection have to be ensured over very long timescales, from decades, in cases where the decommissioning of a nuclear installation is deferred. Thus, there has to be a long term commitment to creating and maintaining efficient infrastructure in the schemes and strategies for radioactive waste management involving adequate active and passive measures [1].

2.3.35.2. Present status of experimental research, theoretical understanding, and future challenges

The research activity of the team is focused on the following subjects and directions: liquid radioactive wastes treatment, solid radioactive wastes treatment; confinement of used radioactive sources, disposal of confined radioactive wastes. The research projects, interdisciplinary and entrepreneurial initiatives for previous 4 years are aimed:

2.3.35.2.1. The enriching the knowledge in above fields

Projects *"Methodology for the characterization of low and medium active nuclear waste resulted from the operation of nuclear research reactors and post-irradiation examination – determination of scaling factors"* , *"Researches regarding the optimization of the radioactive* *waste disposal practices at Baita Bihor National Repository (DNDR) in order to assure the radiological safety according to national and international reglementations"*, *"Long term behaviour evaluation of cement conditioning matrices used for management of radioactive wastes at IFIN-HH"*, *"Assistance to Develop Technology and Improve Capability for the Conditioning of Disused Sealed Radioactive Sources including Alpha and Neutron Sources"*, *« Technical Assistance to IFIN-HH Radioactive Waste Management Department to improve its operational skills "*had the general objectives:

- characterization of the radioactive waste by nondestructive methods applied for radionuclides, whereas destructive methods were performed for the measurement of the full radionuclides inventory, resulting in a full knowledge of the radionuclides inventory;
- physico-chemical characterization of the radioactive waste;
- elaboration and implementation of technologies for safe storage of radioactive long life sources: Am-241,Pu-238, neutrons, etc.
- management of metallic, non-metallic and atypical wastes;
- implementation of the methods for the minimization of radioactive waste from decontamination and decommissioning of nuclear facilities;
- chemical and mechanical decontamination;
- development of engineering barriers;
- evaluation of the impact of radioactive waste disposal practices on environment, population and operational personal and the optimization of these in order to assure the radiological safety in accordance with the national and international reglementations and recommendations.

Results of these projects allow the management of radioactive waste in conformity with the requirements of national standards and regulations for the nuclear security, protection of professionally exposed workers, population, environment and property, respecting also the international treaties in which Romania participates.

2.3.35.2.2. Developing the infrastructure devoted to the management of radioactive waste

«Upgrading of the Radioactive Waste Treatment Plant (STDR) from the National Institute of R&D for Physics and Nuclear Engineering "Horia Hulubei" IFIN-HH", *"Up-Grading of the Baita-Bihor Repository for Institutional Radioactive Waste in Romania"*, *"Improvement of facilities for radioactive waste treatment and conditioning (Magurele, Bucharest-Romania)"*, *"Development of facilities for radioactive waste final disposal (Baita, Romania)", VVR-S decommissioning, EK-10 spent fuel repatriation and upgrading Radioactive Waste Treatment Plant"* projects had the main goal to improve the radiological safety of the institutional radioactive waste management by providing new equipment and training by :

- radiation and contamination monitoring, personal dosimetry and source characterisation equipment;
- 377 overpack drums to enable the most seriously degraded historic wastes to be repackaged and disposed of; new truck with a substantially greater load carrying capacity, enhanced waste handling facilities and off-road capabilities
- new enhanced sensitivity and highly mobile, waste characterisation and assaying system;
- providing equipment for radiochemistry, spectrometric analysis and mechanical tests laboratories;
- developing and implementation of three operational databases on radioactive waste management, namely: **FOXPRO-** for management of radwastes received and stored for processing to STDR and accounting packages produced here and deposited to DNDR Baita, **MICROSOFT ACCESS –** for recording sealed radioactive sources used since 1986 to present and solid waste received from 2005 to present; **RWMR** -Software application for managing radioactive waste inventory records.

The results obtained in these projects will lead to modernizing the infrastructure of IFIN-HH Radioactive Waste Management Department making possible new research topics in the field and participation to international framework research projects.

2.3.35.2.3. Evolution of human resources and raising the professional training of staff

The research team is composed of 8 researcher and 2 senior engineers for technical development, of which 5 PhD and 2 PhD students with specialization in the applied research.

We aimed to continuously improve training of staff by participating to comprehensive courses of theoretical and practical training in radiological protection and radioactive waste management best practice. It was the main objective of the IAEA project *„Strengthening IFIN-HH's Capacity in Radioactive Waste Management"* and UK-DTI project *"Training in radioactive waste management"*.

Results of the research team were the subjects of 29 published articles, 52 conference presentations, 3 contributions to IAEA TECDOC elaboration, 1 patent application.

2.3.35.2.4. Future challenges

Management systems should be implemented for all stages of waste management, from waste generation to disposal. The management system should support the development, implementation and continued enhancement of a pragmatic and positive safety culture, and promote the adoption of best practices, regardless of the type, scale, complexity, duration, and evolution of the waste management activities [2]. The management system for radioactive waste activities should support the safety and environmental protection culture throughout all levels of the organizations involved. Storage and disposal are subjects for future extensive, multidisciplinary research.

With this goals in the mind the research team will approach the complex tasks due its multidisciplinary structure: physicists, analytical chemists, radiochemists, diplomats in science and engineering of oxides materials, physics, metallurgy engineering, mechanical engineering, mining engineering, land reclamation and environmental engineering.

The targets for the next future are related to:

- Replacement liquid waste treatment and conditioning line
- Technology and equipment for decontamination by blasting
- eplacement / addition of technology for incineration with supercompaction
- Technologies for aqueous liquid waste pretreatment with complexing agents
- Technology for graphite immobilization and conditioning
- Technology for processing radioactive metallic aluminum
- Qualifying new types of packages with radioactive waste conditioned
- Accreditation of the laboratory for mechanical and physicochemical radioactive matrices testing
- Accreditation of the laboratory for atomic and nuclear physics methods analysis

References

2.3.39.1. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management - joined September 30, 1997.

2.3.39.2. Governmental Decision No. 1259/2002 for the approval of the National Strategy for Nuclear Field Development.

2.3.36. E-36: Reactor Decommissioning Department Activity Report (2007-2011)

2.3.36.1. Introduction

Careful planning and management is essential to ensure that decommissioning is accomplished in a safe and cost effective manner. A good estimate of amount and type of radioactivity in a nuclear facility is important because it can directly affect the whole approach to decommissioning including the choice of the time to start decommissioning and the desirability of delay between stages. In addition, such an estimate will be a great asset in the planning execution to ensure that the facility be decommissioning in a safe, economic and timely manner. This information will assist the planners in determining factors such as the need for decontamination, shielding or remotely operated equipment and shipping. The facility inventory should include detailed inventories for individual components and should describe specific radionuclide content, chemical form, physical form and volume distribution.

In the latest years, the IFIN-HH/DDR activities are related especially to radioactive waste management.

2.3.36.2. Radioactive waste management

The data determined from an accurate assessment of the radioactive inventory are important for a variety of reasons. The data provide a basis for determining the amount of decontamination to be performed and the method of decontamination to be employed. The type and concentration of radionuclides in contaminated or activated material from a nuclear facility will have a direct bearing on the method of packaging and shielding for shipment as well as for disposal. An accurate inventory of radionuclides is necessary to demonstrate compliance with regulations governing the disposal of radioactive materials. The inventory may, in some cases, show that burial of certain material in a radioactive waste repository is not necessary because of low radioactivity levels. In such cases substantial financial savings may be realized. The analysis, elaboration and the implementation in the radioactive waste management of some investigation methods for alpha, beta [40.1, 40.2] and gamma-ray spectrometry measurements that will produce reasonable measurement uncertainties with lower cost and relatively short duration of data acquisition.

The management systems play an important role and should be implemented for all stages of waste management, from waste generation to disposal [40.3]. The management system should support the development, implementation and continued enhancement of a pragmatic and positive safety culture, and promote the adoption of best practices, regardless of the type, scale, complexity, duration, and evolution of the waste management activities. The management system for radioactive waste activities should support the safety and environmental protection culture throughout all levels of the organizations involved.

2.3.36.3. Gamma-ray spectrometry activity

The applicability and functionality of gamma-ray spectrometry methods to radiological characterization and free release of radioactive waste materials is demonstrated, using experimental methods that are mostly combined with theoretical and simulation procedures using Monte Carlo computer codes.

The proposed aims imply the realization of the specific objectives derived from the evaluation of the current stage of the gamma-ray spectrometry methods used in radiological characterization and free release of the radioactive waste materials, as follows:

- The conceptual design of gamma-ray spectrometry investigation methods necessary in the nuclear facility decommissioning.

- The development, experimentation, functional and utilization demonstration of methods applied in radioactive waste characterization using gamma-ray spectrometry systems with NaI(Tl) detectors (especially for in situ measurement of surface activity) and HPGe detectors (especially used for laboratory measurements) [40.4].
- The determination, testing, functional and utilization demonstration of methods applied in radiological waste drums characterization using ISOCART from Ortec and Segmented Gamma Scanner (SGS) from Canberra gamma-ray spectrometry systems [40.5, 40.6].

This task explores the specific gamma-ray spectrometry phenomena in their deepness in different work conditions.

2.3.36.4. The radioactive waste storage

The routine operation and maintenance of nuclear facilities generate quantities of radioactive material in many different matrices that are packed in many different sized containers. The waste is often packaged in large containers, such as 220 l drums, because process operators find drums more economical to handle than small containers. Cost is an important issue in radioactive waste management as related to sustainable development. If the nuclear industry did not set aside adequate funds, a large financial burden associated with plant dismantling and radioactive waste disposal would be passed on.

According to national and international standards of nuclear domain, all nuclear plants at the end of its life, must be past the conservation stage and subsequently scrapped. Decommissioning activities consist of systematic and progressive reduction of radioactive and non-radioactive materials inventory by complex technical and administrative actions, planned and controlled rigorously, to release the nuclear installations under the authorization requirements for nuclear facility in terms of nuclear safety and radiological assurance, to protect the health decommissioning personnel, population, ownerships and the environment. The decommissioning activities are radiological and non-radiological risk operations, which must be justified and kept to the lowest level cost possible, and with unpredictable situations that may delay the decommissioning process development.

The decommissioning of the VVR-S nuclear reactor is a complex and in the same tine a pioneering activity in Romania country.

The free release has been accepted at European level a few years ago. This complex process requires measurement methods adapted to very low level of radioactivity for the measured materials. The research on this topic is necessary because the nuclear facilities decommissioning involves the free release of large amounts of material.

Regulatory agencies governing the disposal of nuclear waste require that the waste be appropriately characterized prior to disposal. Based on regulations, the radioactivity and the nuclide composition of the waste should be identified before moving, shipping offsite, burying, or placing in a storage area.

Storage of waste packages is a very specific stage of waste management, which could be very long and challenge management systems [40.7]. Extensive technical research is required in the preparatory phase in order to minimize surface contamination and surface dose rates meet requirements. The intended movements of waste packages within the storage facility can be performed safely, preclude inadvertent criticality, and minimize occupational exposures. Procedures are in place for monitoring the integrity of waste packages, controlling, maintaining surveillance of the operational status of accident detection and mitigation equipment and ensuring that waste packages can be easily identified, located and accessed.

Disposal is the best solution but that involves a variety of technical and management issues, and can extend over a very long time (e.g., potentially hundreds of years). For this reason, the disposal decision is based on several consideration involved in assessing and demonstrating safety and environmental protection (e.g., site evaluation, facility design, environmental impact assessment, authorization processes, establishment of waste acceptance criteria, planned and systematic methods for waste inspection and emplacement, operational data collection, facility monitoring and surveillance systems). All these issues are subjects for future extensive, multidisciplinary research.

2.3.36. Technologies development

An important step in the radioactive waste management is done through the "Innovative Technology of Gamma Spectrometric Measurement Applied to the Management of Radioactive Waste Arising from the Decommissioning of Nuclear Facilities" project that is in the finalization stage. This project consists in elaborating, developing and implementing in the radioactive waste management an innovative technology of gamma spectrometric measurement that enables us to obtain a reasonable measurement uncertainty (less than 50%) with low costs and relatively short data acquisition duration. It is based on a method similar to the tomographic method and an original technique for uncertainty evaluation. With the exception of the tomographic method-based technology, all the other technologies have high measurement uncertainty (in many cases it exceeds 500%) due to non-uniform distribution of the activity and non-homogeneity of the material in the container. However, the tomographic measurement system has major disadvantages (particularly very high costs and long data acquisition duration) which have limited its scope very much. IFIN-HH coordinates the project, develops the innovative measurement technology, creates the radioactive standards, tests and demonstrates the functionality and utility of the innovative technology applied to radioactive waste characterization and release of materials from regulatory control.

Another technology developed was the ^{222}Rn Standard System. It contains a Pylon solid ^{226}Ra source, and a glass circuit for circulation and recovery of ^{222}Rn in glass ampoules, at the 77 K temperature [40.8].

References

2.3.40.1. Stanga, D., Maringer, F.J., Ionescu, E., Appl. Rad. Isot. **69** (2011) 227-230.

2.3.40.2. Stanga, D., De Felice, P., Appl. Rad. Isot. **67** (2009) 1716-1720.

2.3.40.3. Dragusin, M., Pavelescu, A.O., Iorga, I., Nucl. Tech. & Rad. Prot. **26** (2011) 84-91.

2.3.40.4. Radu, D., Stanga, D., Sima, O., Appl. Rad. Isot. **67** (2009) 1686-1690.

2.3.40.5. Gurau, D., Sima, O., Appl. Rad. Isot. (2011), doi:10.1016/j.apradiso.2011.08.018.

2.3.40.6. Stanga, D., Radu, D., Sima, O., Appl. Rad. Isot. **68** (2010) 1418-1422.

2.3.40.7. Pavelescu, A.O., Acad. Rom. Scient. Ed., Bucharest, 2010.

2.3.40.8. Sahagia, M., Stanga, D., Wätjen, A.M., Luca, A., Cassette, P., Ivan, C., Antohe, A., Appl. Rad. Isot. **68** (2010) 227-230.

2.4. Representative project

One of the basic principles of the scientific policy of IFIN-HH is to develop the local experimental infrastructure in a way that insures the increase of the international visibility for the research opportunities at the local facilities, keeping at the same time the synergy with the R&D work and commitments in the frame of large international collaborations. A practical way to obtain significant international visibility is to provide the scientific community with a research facility or device that must be well suited for research topics of high interest in the field. On the other hand, that research facility or device should provide uniqueness and complement well the research possibilities at existing international infrastructures. It is also recommended for the new facility or device to target a research direction *with a large international scientific community impact and for which there is a recognized high-level expertise in the Institute.*

The *In-beam Fast Timing Project* of IFIN-HH is based on the above considerations particularized for the experimental nuclear structure research field. The underlying idea was to make use of the new $LaBr_3$(Ce) scintillation material that appeared on the market during the last years, a scintillator that can provide a relative energy resolution of 2-3% and timing resolution down to 150 picoseconds, and to build a high granularity and efficient mixed gamma-ray array comprising both hyper pure Ge (HPGe) detectors and $LaBr_3$(Ce) detectors, that is suitable for lifetime measurements using electronic timing in in-beam experiments. The idea to build such a complex setup is well motivated because:

4. *It covers a research topic of high interest:* One of the fundamental findings of quantum mechanics is that the transition probability between two states of a quantum system is related with the wave functions of the two states connected by the transition operator. In particular, for an atomic nucleus the probability of a transition from a quantum state to another through gamma decay is related to the overlap of the wave functions of the initial and final states connected by the electromagnetic transition operators corresponding to the allowed multipolarity values. The lifetime of a gamma decaying state is proportional with the reduced electromagnetic transition matrix element, and this matrix element brings a lot of information about the structure of the nucleus itself. For instance, enhanced electric quadrupole transitions E2 indicate collectivity, while hindered E2 transitions are the signature of shell closure, very different single particle configurations or shape changes. Only from these basic considerations it is easy to understand why since the beginning of nuclear spectroscopy a significant part of the experimental effort was, and continues to be, dedicated to the measurement of the lifetimes of excited states in atomic nuclei.
5. *It provides uniqueness and complements other facilities:* Several techniques to measure lifetimes of nuclear levels were developed during the years, each of them being effective over well-defined time range. Currently, the most popular are the Doppler effect based techniques such as Recoil Distance Method (plunger) and Doppler Shift Attenuation Method, the Coulomb excitation and the determination of the decay curve by electronic timing. The Doppler effect based techniques are effective for lifetimes in the femtosecond to picosecond range and are used in almost all heavy-ion accelerator facilities in different versions. Recently, versions like Differential Plunger Method start to be implemented at large acceptance spectrometers like PRISMA (INFN-LNL) or VAMOS (Ganil) or at radioactive beam facilities like FRS-GSI or MSU. Coulomb excitation is mainly used at present at radioactive beam facilities like ISOLDE, FRS-GSI or SPIRAL and allows the direct measurement of the E2 transition matrix elements for a limited number of states. The Coulomb excitation results are often complemented by direct measurement of the lifetimes in order to complete the spectroscopic information. The determination of the decay curve by electronic timing covers the largest range of lifetime values, from several picoseconds to seconds or more. The principle is simple, the time dependence of the number of decays with respect to a time reference has to be measured and the lifetimes are obtained according to the radioactive decay law. The complexity arises when lifetimes in the range of picoseconds to

nanoseconds must be measured, since very fast gamma detectors with good time resolution and sophisticated experimental techniques, with generic name "fast timing", must be used. For many years the "fast timing" techniques were used only to investigate states populated in beta decay, and this was a natural limitation due to the poor energy resolution of the fast gamma detectors used, mainly BaF_2 scintillators. The $LaBr_3$(Ce) scintillation detectors provide the best gamma-ray relative energy resolution achievable with scintillators, between 2 to 3% depending on the size of the crystal. On the same time, these detectors have very good timing, with time resolution of about 160 picoseconds for 1.5"x1.5" cylindrical crystals and support very high counting rates. This fact is a true boost for the field because it opened the possibility to deal with complex gamma-ray spectra with fast scintillators and use the fast timing technique to measure lifetimes of excited states of reaction products from in-beam experiments, provided that the original complexity of the raw gamma-ray spectra is reduced by appropriate selections made using high-resolution HPGe detectors.

6. *It addresses a large scientific community:* During the last two decades the community of researchers studying the nuclear structure using gamma spectroscopy has continuously grown, and today is the largest in the low-energy nuclear physics field, counting in Europe alone hundreds of physicists. In the past, this community built and successfully used many complex devices like the hyper pure Germanium multi-detector arrays GASP, EUROGAM, EUROBALL or GAMMASPHERE. Nevertheless, none of these devices was provided with ultra-fast scintillators because the only material available at the time was BaF_2, which has poor energy resolution. With the appearance of $LaBr_3$(Ce) the energy resolution problem was overcome and the availability of a mixed HPGe-$LaBr_3$(Ce) for in-beam experiments is strongly requested.

The construction of a HPGe-$LaBr_3$(Ce) array in Bucharest is also useful for the activity within several large international collaborations where IFIN-HH participates. A major part of NUSTAR, the HISPEC/DESPEC collaboration, plans to build a high-granularity $LaBr_3$(Ce) array to be used for experiments at the largest radioactive beam infrastructure that is under construction now in Europe, the FAIR facility. Part of the experimental problems that are expected when setting up a multi-element $LaBr_3$(Ce) array and coupling it with Germanium detectors, as well as many selectivity tests, can be approached using the mixed array in Bucharest. Thus, from the conception phase the HPGe-$LaBr_3$(Ce) array for in-beam experiments attracted a large interest from the HISPEC/DESPEC collaboration. The same large interest came from the fast-timing collaboration performing experiments at ISOLDE/CERN, due to the availability of highly improved equipment and the complementarities of physics experiments that can be performed at ISOLDE/CERN and the Tandem Laboratory of IFIN-HH.

Proof-of-principle and construction of the array

The first steps in the project were in the frame of a Romanian-Bulgarian-French collaboration. It was agreed within the collaboration to build a "demonstrator" phase HPGe-$LaBr_3$(Ce) array in Bucharest at the beginning of 2009 and use it for three months at the IFIN-HH Tandem accelerator to demonstrate the feasibility of in-beam fast-timing experiments. For the "demonstrator" phase the array was composed of 5 $LaBr_3$(Ce) detectors of different dimensions and 7 HPGe detectors. The collaborators from INRNE and University of Sofia provided two 1" $LaBr_3$(Ce) detectors and the holding structure for the scintillators, while CSNSM Orsay and CEA (France) provided two 1.5" and one 2" $LaBr_3$(Ce). IFIN-HH had the major contribution, providing 7 HPGe detectors with 55% efficiency, and the electronics and infrastructure needed to run the experiments. The main problems to overcome in the "demonstrator" phase were

To conserve the time resolution of the $LaBr_3$(Ce) sub-array in an optimized electronic setup. In decay spectroscopy experiments where only two fast gamma detectors are used, this comes naturally because the time difference between their signals is directly measured using a time-to-amplitude converter (TAC). In the case of using many detection elements this is no longer possible because one should have a TAC for each pair of detectors, which leads to a prohibitive number of modules. The solution was to keep a high-quality timing signal from each detector, to restrict the counting rate using the trigger condition and use this signal as start for one individual TAC per detector. A common stop signal without electronic jitter was provided, and the time difference for each pair of detectors was obtained in the offline analysis.

To have the proper coupling between the "slow" branch (HPGe) and the "fast" branch of the array. The response of the Germanium detectors is considerably slower and their time resolution is almost two orders of magnitude worse than $LaBr_3$(Ce). Thus the time range used for the definition of a coincidence event with HPGe is at least a factor five larger than the typical 50 ns time range that can be used for $LaBr_3$(Ce) in order to preserve their timing sensitivity. Thus the timing information regarding the coincidence with HPGe cannot be stored in the $LaBr_3$(Ce) time parameter. The solution adopted was to construct the $LaBr_3$(Ce) trigger component as good timing reference by avoiding jitter-generating electronic modules and preserve this timing when the "global" timing reference is built. In this way the "fast" branch becomes self-referred for timing and the HPGe-$LaBr_3$(Ce) coincidence information is stored in the HPGe time parameter.

To develop reliable data analysis procedures. The data analysis procedures for fast-timing experiments using two detectors reported before were rather complicated and very difficult to apply for a multi-detector system. It was therefore of utmost importance to develop a reliable and still simple data analysis algorithm. This offline algorithm uses only a ^{60}Co gamma source and provides very good walk correction and time alignment of the $LaBr_3$(Ce) detectors, making it possible to treat all of them as identical detection elements.

The detailed information about the technical solutions, data analysis procedures and the performance of the in-beam fast-timing array is presented in *Eur. Phys. J. A 46, 329–336 (2010)*.

Several test experiments were performed to investigate the performances of the apparatus. First, the lifetime of the yrast $7/2^+$ state in ^{107}Cd was re-measured, and the value obtained, 0.69(3) ns was found in good agreement with the ENSDF adopted value of 0.71(4) ns. Another test experiment aimed to approach the lower limit for the lifetimes that can be measured with the setup. From systematic, the lifetime of the first $3/2^+$ excited state of ^{199}Tl was expected to be ~100 ps or smaller, and since this nucleus can be easily populated using the ^{197}Au(a,2n) reaction, it was selected as a test case. With the "Fast Timing" array it was obtained for the half-life of the first $3/2^+$ state in ^{199}Tl the value of 47(3) ps, corresponding to a perfect agreement with the systematic of the M1 and E2 reduced transition for the same state in odd-A Tl isotopes (Figure 2.4.1). These results demonstrated the sensitivity of the array, which can be used to measure in-beam half-lives from 20 nanoseconds down to the level of 50 picoseconds. This range of lifetimes is practically not accessible to other methods.

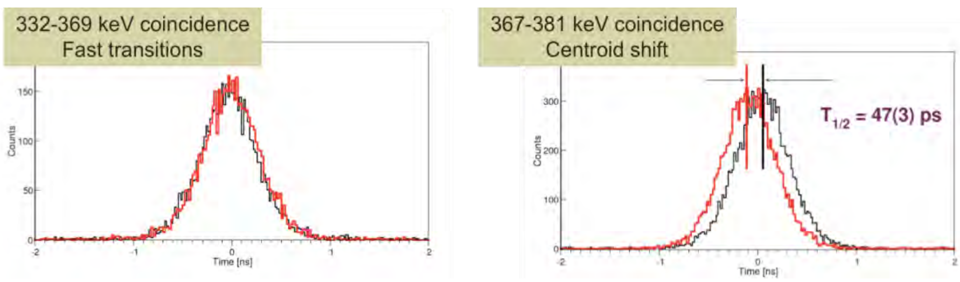


Figure 2.4.1 Time difference spectra illustrating the measurement of the first $3/2^+$ state in ^{199}Tl using the centroid shift method. The 332-369 keV ~~is~~ coincidence, which is a sub-picosecond fast coincidence is shown as reference for "zero" lifetime.

Following the success of the "demonstrator" campaign, the construction of a larger in-beam fast-timing array started. IFIN-HH made consistent investments in $LaBr_3$(Ce) detectors, creating a pool counting today 14 detectors to which one adds other 3 provided by the University of Surrey(UK) in the frame of NUSTAR fast-timing collaboration. The local expertise in mechanics and electronics was used for building the casings for the detectors, holding structures, shielding, voltage dividers, etc. Consistent investments were made also in electronic modules, and allowed to build a more reliable electronic scheme extended for more detection elements and with improvements like extended blocking for constant fraction discriminators or robustness at high counting rates. Today the *In-beam Fast Timing Array* accommodates 8-10 hyperpure Germanium detectors and up to 12 $LaBr_3$(Ce) detectors. A picture of this array, which now operates in the Department of Nuclear Physics of IFIN-HH is shown in Figure 2.4.2.

Figure 2.4.2 The In-Beam Fast Timing Array

Physics experiments using the In-Beam Fast Timing Array

After reporting the first results obtained in the "demonstrator" phase, the In-Beam Fast-Timing Array attracted the interest of the international nuclear structure community. The array is ideal to study nuclear states with half-lives above 20 ps, a range which barely overlaps with the upper limit of the plunger technique and was quite difficult to study before. These excited states with half-lives of tens of picoseconds to nanoseconds are extremely interesting because they are true "fingerprints" of the changes in the structure of atomic nuclei. Consequently, an intense experimental campaign dedicated to measurements of parity-changing transitions and single-particle states is presently on the way at the Tandem Laboratory of IFIN-HH, with a large international participation. During 2009-2011 the international Physics Advisory Committee of the laboratory approved more than 20 in-beam fast-timing experiments, which covered more than 30% of the total available beam time. Foreign groups from different universities and institutes from Europe proposed approximately 70% of these experiments, in collaboration with the local group from IFIN-HH. In total, approximately 100 researchers from more than 20 research institutions from 10 European countries and USA were involved in these experiments.

The experiments covered an extended nuclear mass range and topics, from the intruder configurations in ^{34}P close to the island-of-inversion to the evolution of collectivity in the neutron-rich ^{188}W populated in sub-barrier transfer. A large amount of experimental data presently under analysis, will lead to many publications in the near future and will form the subject of Master and PhD theses in Romania and other European countries. Figure 2.4.3 shows a typical example of the quality and richness of the experimental data for a single isotope, ^{138}Ce, extremely useful for the understanding of the high-spin structure of this nucleus.

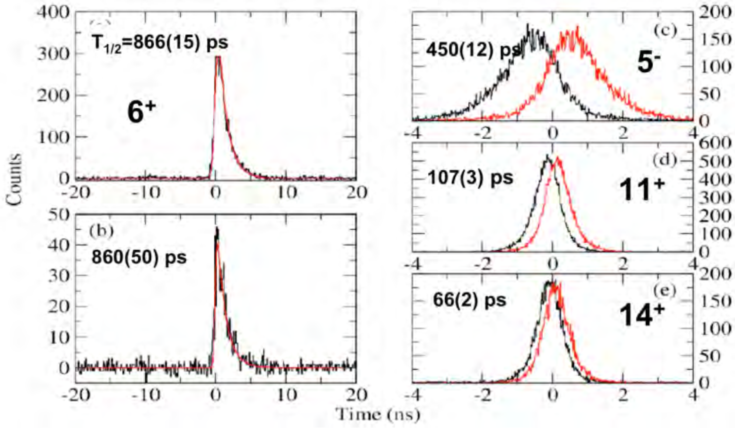


Figure 2.4.3 Lifetime measurement of yrast states in ^{138}Ce using the in-beam fast timing technique

The *In-beam Fast Timing Project* of IFIN-HH is an example of a successful project that led to a significant increase of the international visibility and recognition of the scientific activity of the Institute. The construction of the HPGe-$LaBr_3$(Ce) provided the Tandem Laboratory with a specific scientific topic, being today the only permanent in-beam fast-timing array in Europe. In the same time, the development of this project constitutes an important component of Institute's contribution to the large-scale facility ongoing projects, such as those related to the nuclear structure studies at FAIR and ISOLDE/CERN.

SELF-ASSESSMENT REPORT
AND INSTITUTIONAL DEVELOPMENT PLAN

3. Institutional development plan for the next 4 years

3.1. Scientific SWOT analysis.

STRENGHTS	**WEAKNESSES**
- pursued research and education activities, with acknowledged results and outstanding international visibility - active participation in the large international collaborations in the field of competence - research activities, applications and technological developments in domains of scientific relevance and of major social interest - modernised research infrastructure, recently upgraded to European level - new laboratories comprising state of the art research equipment, on the way to commissioning (2012)	- inefficient tehnological transfer - considerable decrease of the atractiveness of research work as emphasized by the steadily declining number and droping quality of the available human resources
OPPORTUNITIES	**THREATS**
- full right participation in major international collaborations in the field - initiation și achievement of the European project ELI-NP - National and European, as mentioned in Horizon 2020 and guvernmental foresights	- discontinuous and unpredictable financing - instability of the evaluation criteria of the scientific research

3.2. Strategic scientific objectives and directions.

In a nutshell, the strategic objectives of IFIN-HH include:

- keeping up the institute's tradition and boosting its role in basic nuclear and subnuclear physics research;
- increasing the share of applied research and turning the results to good account via technological transfer and certified services;
- improving the status of the IFIN-HH facilities of national relevance and integrating them in the emerging structure of Small-Scale European Facilities;
- rehabilitating the utility infrastructure and narrowing the gap between the institute's research infrastructure and the European average down to a mutually acceptable level;
- rebalancing the age profile of the research staff;
- joining forces with physics education to create an enduring human research potential by creating an attractive scientific environment and a credible financial and cultural motivation.
- getting efficiently involved in European projects and raising the share of work on EU Framework Programs to 10% of total contracted volume;
- continuing to work together with historical partners, particularly those with an appropriate strategic potential, and developing the legal, organizational, financial, and logistic sides of the concept of privileged strategic partnership, based on principle agreement and growing support from the government;
- creating viable corporate structures, including a scientific and technological park and specific incubators, to promote physics for profit;
- taking the technical, scientific, managerial, and financial opportunities provided by the decommissioning of the IFIN-HH research reactor for turning the institute into a pilot station, a national expert center, and a training ground in dismantling nuclear facilities – throughout the decommissioning project;
- promoting expertise and competence resources through an aggressive, adequately funded certification campaign;
- earning for IFIN-HH the official status of an expert body of the National Commission for Nuclear Activity Control, Nuclear Agency, and National Agency for Radioactive Waste; and
- keeping up efforts to multiply large scale, high value projects, improve their management, and maximize their scientific results.

The earlier mentioned background and strategic objectives advocate the promotion of the following strategic research directions, which are proved viable and competitive and in agreement with the vocation, history, and scientific and technical potential of IFIN-HH:

- theoretical physics;
- atomic nucleus physics;
- particle physics;
- particle accelerator physics;
- applied nuclear physics and nuclear engineering;
- life and environmental physics; and
- information technologies.

Theoretical physics research at IFIN-HH deals with a distinctively broad range of issues and is recognized for excellence in academic circles worldwide. It will continue to prove its viability and come across as a brand image of the Institute.

Atomic nucleus physics, a key IFIN-HH contributor to Europe's main basic experimental research centers, will enjoy a similar status, strengthened by its firm productive roots in continental research.

The Institute's ***particle physics*** research that has earned European and Transatlantic recognition for its painstaking contributions, including many significant achievements, for the past half-century, will further build on its involvement in Europe's great experiments.

Particle accelerator physics has to and will rise to prominence in the near future. It will nevertheless be faced with the inherent trouble of transition between generations before younger scientists can launch their own research and investment projects.

Applied nuclear physics and nuclear engineering, which go back a long way at IFIN-HH, are important in some sensitive areas of domestic industry and health care. They are currently recovering from a successful, though painful and protracted, shakeup and should be able to maintain their domestic status as sole suppliers of some products and services.

Life and environmental physics have been propelled into the limelight by growing postindustrial concerns about security, environmental protection, and quality of life in Europe and America. They will also gain momentum at IFIN-HH where specific laboratories will be established to focus on some advanced sectors of biophysics and biomedical technologies. Once duly certified, they will be able to supply key services to governmental bodies and society in areas such as risk management, vulnerability to natural and technical emergencies, and the assessment of how nuclear and industrial activities impact on human health and the environment.

Information technologies, whose role is constantly rising in the top-notch fields of physics, will be developed at IFIN-HH in close connection with the large GRID systems extending at European and global levels.

3.3. The human resource strategy.

Background

IFIN-HH is one of the most complex institutes of research and development in terms of research areas and thematic, which have a direct impact not only on the human resources needs, but also on the distribution of the positions and the responsibilities. The institute has 12 research departments, each of them representing a very specific area of research in physics. In order to ensure the performance and efficiency of the activity, a complex and well planned scheme of personnel is needed.

The research staff consists of research assistants (most of them PhD students), junior researchers (postdoctoral students or graduates) and senior researchers (with experience and recognized reputation). As most of the researchers are conducting experiments using the facilities of the institute, the auxiliary staff in distributed in three types of positions, namely engineering staff (with specific tasks of doing high-qualified technical work), technicians (allocated to research teams and projects for ensuring specific technical support and assistance for experiments) and maintenance and operation technical staff (in charge with monitoring and ensuring the functioning of the large nuclear equipments). Considering the requirements for technical support and assistance for research staff and for ensuring the functioning and the operation of the research facilities and, in this respect the workload implied by this specific requirements, the correct distribution of the technical workforce has to respect a ratio of 2 technical to one researcher.

Another specificity of IFIN-HH's staff is the one related to the administrative staff which does not follow the standard schemes of personnel in the sense that only part of them are administrative people doing usual administrative activities (financial, human resources, accountancy, legal, procurement, administration etc), the other significant part consisting of staff ensuring the proper work environment for performing top-level research (The National Library of Physics, the IT Network Department, the Marketing and Technological Transfer Center)

General objectives of Human Resources Strategy

The Human Resources Strategy for the next five years has two main objectives:
- Strengthening the components which have proved their efficiency.
- Identifying new approaches which have either been successfully applied in prestigious research institutions or arise from the national or international environment and fits the needs and the objectives of the institute.

One of the major pursuits of the management is to succeed in maintaining the most appropriate scheme of personnel in terms of quantity and quality of people. Therefore, the following will be strengthened:

- Keeping a consistent and coherent salary grid based mainly on the individual and team performance
- Maintaining the existing system of performance assessment and improving it with elements which are required by the evolution of the European and international research standards and by the necessity of adapting it to the institute future needs;
- Maintaining the actual policy of encouraging and promoting trainings in research and technical fields for the respective staff
- Ensuring permanent access to resources of information in all fields of physics research (electronic libraries, prestigious journals etc)
- Encouraging the active participation at scientific national and international events (conferences, workshops etc)
- Constant development of research programmes and thematic corresponding to the European and international trends and to the individual objectives and topics of scientific interest
- Maintaining the research infrastructure at top-level scales through the constant improvement of the technology and the acquisition of the most performing equipments able to support high-standard experiments
- Constant participation at large scale international collaboration
- Partnerships with prestigious research institutes and universities
- Active participation of IFIN-HH's researchers (especially senior researchers) at the educational programmes (doctoral schools, postdoctoral programmes etc.)
- Collaboration with technical universities in defining, within the curricular area, specific disciplines and topics related to the research area of the institute
- Organizing periodically visits on the site (at the institute's departments and research groups and laboratories) for students
- Developing the training programmes associated to the specific jobs of the auxiliary staff of the institute
- Persisting in organizing constantly scientific seminars inside each research department
- Offering permanent information on the website of the institute regarding the scientific events and opportunities
- Encouraging young researchers in assuming direct responsibilities within the international collaborations of the institute
- Encouraging the return of Romanian scientists from abroad by strengthening the dissemination of the career development opportunities offered by the institute within the scientific community
- Maintaining the administrative decentralization at the level of research departments
- Keeping the policy of periodical competition for promotion and employment of qualitative research staff
- Keeping and strengthening the policy of college recruiting
- Maintaining fairness/equity in the recruitment process
- Maintaining the social and financial support for PhD students
- Maintaining the procedure of evaluation which includes an ex-ante self-evaluation having the role of strengthening the perception of its own work and results. Annually, at the beginning

of every year, the staff will have to continue to fill in the evaluation form and to pass it to his direct coordinator which will confirm or correct it and communicate the Scientific Director the results.

New approaches for the future human resources policy:

- Focusing on the capitalization of the research results by the establishment of related additional criteria for evaluation in parallel with a system of financial stimulation in this respect
- Preparing the commissioning of the new facilities in terms of human resources needs (scientific expertise: training for PhD students and young researchers at prestigious research institutions with similar facilities and technical expertise: engineering and technicians benefiting from specific trainings dedicated to the operation and the maintenance of the facilities)
- Enlarging the thematic areas of the training programmes dedicated to the auxiliary staff following the new directions of research instituted by the new infrastructures built in the institute in order to cover the expertise needs in technical support and redefining the scheme of personnel considering the human resources needs for each new facility
- Exploring new opportunities in collaborating with industry in the common areas of interests
- Establishing a system of periodical assessment of the general and individual workload as a basis for evaluating the necessary workforce in terms of expertise, type of personnel and individual tasks in such a manner that the individual objectives comply with the general objectives of the institute. Depending on the results of evaluation, the necessary actions will be decided in the sense that, on a case to case basis, specific measures of improving and stimulating performance, reallocating tasks, rewarding the quality will be adopted. The most appropriate proportion of numbers of positions will have to be respected in order to keep the qualitative and quantitative level of research work within the standards applicable to research infrastructures. A goal which will be followed in this respect will be ensuring the correct scheme of the distribution of the positions in the sense of maintaining the balance between the competencies and the activities.
- Extending the regular competitions for research position beyond the national level, up to the European and international levels
- The responsibility of the career development will be shared between the individuals and the management by finding the best methods to challenge and stimulate the individual performance in order to finally reach the project objectives.
- Encouraging the permanent exchange of good practice between research groups and departments in terms of a proper assignment of team member roles and responsibilities;
- Establishing a solid and coherent proposal of joint doctoral programme between the institute and the universities on the basis of partnership agreements with the involvement of the senior researchers of the institute having the legal capacity of coordinating PhD students
- Establishing a system of scholarships dedicated to attract best students having a real scientific potential
- Fostering partnerships with industry through an institutional strategy developed by the Center for Marketing and Technological Transfer Center of the institute
- Establishing a system of proper assignment of tasks and responsibilities between the research staff, the engineering staff and the technical staff
- Securing the participation of the best researchers at the research projects conducted by the institute of the best scientists, engineers and technicians in accordance with the needs and the allocated budget
- Adapting the system of recruitment, evaluation and career development to the ones developed by the prestigious research institutions from abroad and in accordance with the European Conduct of Research
- Successfully finalizing the plan for establishing a qualitative labor environment

- Assessing and adapting the compensations policy according to the European standards and with respect for the objective of attracting the best scientists
- Maintaining the most appropriate proportion of numbers of positions in order to keep the qualitative and quantitative level of research work within the standards applicable to research infrastructures. A goal which will be followed in this respect will be continuously ensuring the correct scheme of the distribution of the positions in the sense of maintaining the balance between the competencies and the activities.

3.4. Mechanisms for stimulating the appearance of new research directions.

The new experimental facilities that will be developed in the frame of large international collaborations can become the main sources of new research directions of high interest for the nuclear physics community. Our Institute is involved in several such large international collaborations like ELI-NP, FAIR, CERN and SPIRAL2 and in this respect is an active part of the nuclear physics community seeking for new phenomena, new theories, new methods and techniques.

From this point of view, the main mechanisms that will be used by the Institute for opening new research directions are:

- to be an active partner in the development of infrastructure that supports new types of research, with human, material and financial resources
- to identify new types of experiments that can be accomplished only at large-scale experimental facilities. After such types of experiments are identified, the Institute will support the creation of a core-workgroup of researchers interested in the obtainable physics results and the process of creating a larger scientific community, of disseminating information and attracting young specialists and students. The Institute will grant its support from the very beginning, if possible even when no funds for the new research directions were obtained.

New research directions can also be triggered by the new research infrastructures that are currently under development in the institute. In this respect, the Institute will:

- Encourage interaction between its own researchers and research groups from other institutes and Universities, including those acting in other domains of science, in order to identify new opportunities
- Stimulate the increase and the strengthening of the quality for the human resource involved
- Support from the very beginning emerging collaborations
- Offer institutional support for attracting both external users at and beneficiaries of the new research infrastructures

Related to the existing small scale international experimental facility (the Tandem Accelerator), the Institute will continue to:

- Encourage the activity of attracting external users and the development of international and domestic collaborations in order to gain a critic mass that can lead to new ideas and techniques
- Support all activities that can lead to an increase of the visibility

Other mechanisms for opening new research directions that can be used by the Institute are:

- Stimulate cross-departmental works and/or collaboration between research teams in order to develop an interdisciplinary approach of the research and/or to strengthen the quality of the human resource involved
- Support emerging research and new techniques in the Institute
- Collaborate with academic staff in order to develop PhD and MSc programs of interdisciplinary nature or covering research directions related to its own research

facilities/ large-scale experimental facilities
- Continue to actively participate to the existing international cooperation
- Support information dissemination and access to information for its researchers

3.5. Financial SWOT Analysis

Financial SWOT analysis is done taking to account that the economic and financial activity is a support activity to reach the scientific objectives of the institute. In this respect this analysis should be correlated with the scientific SWOT analysis (pct. 3.1.)

Strengths
- Financial stability;
- Payments in due time (salaries, suppliers, taxes, etc.);
- Existence of a fund for investment (over 1,000,000 euro);
- Organization of the Economic and financial activities by cost centers;
- Online tracking of expenditures, revenues and cash-flow by department, project and phase.

Weaknesses
- Impossibility of establishing a fund available to finance research projects considered with high risk or co-financing of projects;
- High costs maintenance of the administrative infrastructure (IFIN owns 46ha land and over 50.000 sqm of construction);
- High costs of research infrastructure.

Opportunities
- Romania's commitment to increase the research budget to 3% by 2020 (1% public funds and 3% private funds);
- Increased funding possibility according to the construction of new major research infrastructure: FAIR, ELI-NP, SPIRAL2;
- Awareness of the political factor that research is an important factor for overcoming the economic crisis.

Threats
- The global economic situation may have repercussions on the amount of allocations for research and development;
- Lack of private funds to finance research and development activities;
- Lack of regulation for attract the private fund for research.

3.6. Infrastructure: investment plan and strategy

The investment strategy of the institute is focus on two fundamental components in its further development:

- Maintaining and developing administrative infrastructure;
- Developing of research infrastructure in accordance with the new directions of research for the institute: interaction of high power lasers with matter, photonuclear reactions, radiopharmaceutical research, applications of nuclear methods and techniques etc.

Thus, to meet the first component, in the next period the Institute will try to ensure optimal functioning of the administrative infrastructure. In this respect the institute will rehabilitate the gas network, water network, expansion of administrative building, construction of the Student Center, construction of the second Ph.D. Center.

To fulfill the component on development research infrastructure, institute is considering several direction: implementation of the project to build research infrastructure Extreme Light Infrastructure - Nuclear Physics, completion of new research laboratories according to the project "Infrastructure development for frontier research in nuclear physics and related fields" and existing research infrastructure.

The Extreme Light Infrastructure - Nuclear Physics facility (ELI-NP) will create a new European laboratory with a broad range of science covering frontier fundamental physics, new nuclear physics and astrophysics as well as applications in nuclear materials, radioactive waste management, material science and life sciences. The site of ELI-NP Research Infrastructure is located adjacent to the beneficiary's current site hosting several national installations in the field of nuclear physics. ELI-NP will add about 36,500 sqm of new, high quality, energy efficient buildings. About 23,700 sqm are allocated for high-power laser system, gamma-beam production system and instrumentation for experiments distributed in 8 experimental halls designed in a reconfigurable arrangement through the use of movable concrete blocks

In the framework of the project "Infrastructure development for frontier research in nuclear physics and related fields" (2010-2012) the institute will build 8 new laboratories to support the nuclear applications and to support participation in large international collaborations. The project components are follows:

1. Laboratory for developing and testing the method of the FAIR international project (RO @ NUSTAR);
2. Centre for radiocarbon for Environment and Biosciences (TANDIMED);
3. Tritium laboratory with multiple users (TRITIULAB);
4. Nuclear spectrometry center for energy, environment, materials and health (EMMAS);
5. Research Centre for Radiopharmaceuticals (CCR);
6. Research center of excellence for distributed computing, methodical, physical and participation in large international collaborations (CEXMECDIF);
7. Local center for radiological environmental monitoring (CLRSMA);
8. Development of underground laboratory measurement and detection of ultra background atmospheric muons (LNSP)

3.7. Technology transfer and the attraction of non-public funds.

The next four years are vital for the development of the technology transfer (TT) and marketing activities aimed at strongly anchoring IFIN-HH in the socio-economic development of the country, based on an increased visibility, conversion of scientific and technological advances into marketable goods and services, a higher rate of return per euro invested in research and attraction of private funds.

Unfortunately, the prolongation of the economic crisis and stagnation of most European economies will represent a strong challenge for IFIN-HH's capability to adapt to a new environment, leading to tough measures that will have to be taken by its management in order to cope with.

Investing in R&D at national and European levels will produce positive results in terms of economic growth and employment, if and only if, research and development translated later on in innovation, i.e. new knowledge and technologies effectively available to companies for commercial purpose.

Large-scale research infrastructures, enriched with new projects such as the ELI-NP, have the potential of becoming the catalysts of the strategy shift implementation towards a knowledge-based economy, by connecting the research community with both the academic sector and the industry.

IFIN-HH, in collaboration with The University of Bucharest and Polytechnic University of Bucharest will train during the next four years a large number of PhD and MSc students, as well as a wide pool of individuals well prepared in using modern nuclear equipment and services.

The strategic objectives of the technology transfer can be defined as follows:

- Generating economic growth and employment generation;
- Bringing the intellectual property generated by the Research Infrastructure into public use as rapidly as possible while protecting academic freedom and research ethics and generating an eventual financial return to the Research Infrastructure and their inventors.

Means and ways to fulfill the strategic objectives:

- A pro-active policy towards industrial relationships;
- Translation of strategic industrial trends for IFIN-HH's future research programs;
- Creation of a genuine business and entrepreneurial culture through:
    - Recruitment process;
    - Creation of a Contact Point Engineers/Scientists within the Center for Technology Transfer and Marketing (CTTM);
    - Training of new recruits in business and technology transfer;
    - Pecuniary and non-pecuniary schemes, like creating a fund for innovation.

Specific measures:

- Rethinking the importance of registering and licensing the intellectual property rights of IFIN-HH research team as core of TT activity, with a careful orientation to a broader international licensing (for better use and protection) using a process based on the following steps:

a. Invention disclosure,
b. Evaluation of the commercial potential of the invention,
c. Decision to patent the invention or not,
d. Invention marketing,
e. Negotiation and closing a deal,
f. Monitoring and following-up deals,
g. Patent renewals.

- Exploring new fields and developing new research programs in joint venture with other research institutes especially in the agricultural, industrial, biochemical, environmental and medical fields based on real commercial applications;
- Establishing an active dialogue between academia and industry (through conferences, meetings, round tables etc) in order to identify new business opportunities;
- Negotiating and signing industry sponsored research agreements;
- Joining other research networks (such as HEP Tech) and actively participating in common research programs for both fundamental and applied sciences;
- Using the skilled IFIN-HH's personnel for outsourcing parts/phases of research projects initiated by foreign research institutes in partnership;
- Expanding the fee based services of consulting and training on nuclear activities in accordance with the present and future level of the development of such applications;
- Structuring a "catalogue" (list of) of commercially oriented products and services aimed at offering a contract/price based framework for negotiating with domestic and foreign industry in view of selling IFIN-HH output;
- Special emphasis on manufacturing prototypes and developing small scale production facilities, based on industry support/orders and selling opportunities.

ELI-NP

As the only facility of its kind in Europe, the ELI-NP project (to be implemented in the next four years) will represent a unique opportunity for many Romanian companies to conduct experiments required to secure or maintain a technological advantage. It is not an overstatement to claim that the ELI-NP project will increases the capacity of worldwide research and innovation in this field by a factor of 10, given the levels of brilliance and intensity its laser and gamma systems will be able to develop. Taking into account these specificities, companies eager to obtain or maintain a competitive advantage are likely to apply for access time at the facility. It will be an important task to prepare in advance the technology transfer schemes for this new project in order to maximize its financial return opportunities.

3.8. Strategic partnerships and visibility: events, communications, collaborations.

IFIN-HH's most prominent strategic partners at this stage include:

CERN, Geneva, Switzerland
Participation in multinational research projects – research, equipment design and supply, design and execution of basic experiments, scientific and computing services, etc.

GSI, Darmstadt, Germany
The FAIR (Facility for Antiproton and Ion Research) Project – construction of an international research center in the nuclear area and related aplications that will concentrate the world's most advanced research in nuclear and atomic physics in the medium term.

ELI-NP, Bucharest-Magurele, Romania - construction of the nuclear physics pillar of ELI. It will be the first truly international physics center in Romania, fostering strong and manifold cooperation in practically all fields of physics among the member-countries of the ELI Consortium and other interested parties.

GANIL, Caen, France
The SPIRAL 2 Project – a complex project in particle accelerator physics, enlisting IFIN-HH collaboration in the area of ion beam transport and monitoring.

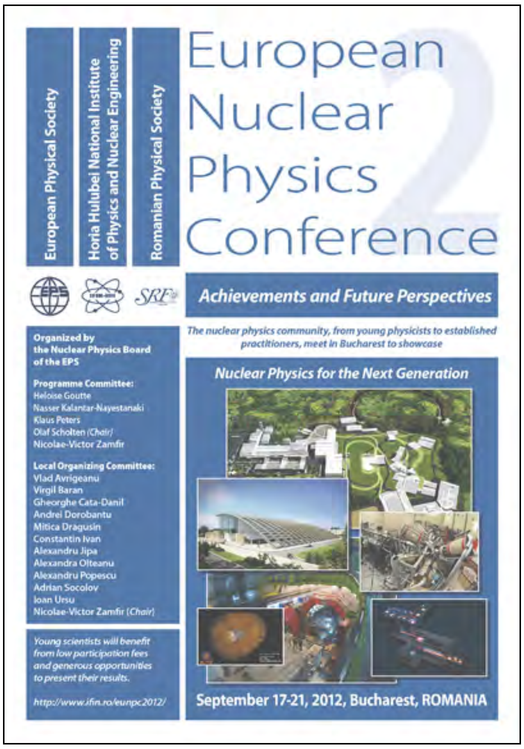
The Joint Institute for Nuclear Research (JINR), Dubna, Russian Federation: multilateral scientific cooperation based on membership status and a number of programs agreed upon.

IN2P3 (France) and INFN (Italy)
Agreements with these national institutes provide the frameworks for collaboration with research centers in their countries in various areas of nuclear physics.

Physics communication for the next four years will focus on these largest European/International scientific collaboration projects of IFIN-HH:

- Building and preparing for full scale operation of ELI-NP, the nuclear physics pillar of the pan-European project ELI (Extreme Light Infrastructure) - Bucharest-Magurele,
- Full participation in the building and scientific program of FAIR - The Facility for Antiproton and Ion Research - Darmstadt, in view of making it fully operational by 2018
- Participation in the experiments and general activities at CERN/LHC - Geneva. It will also target the research and results of the partnerships with Ganil, JINR, IN2P3 and INFN.

IFIN-HH communication activities in the next four years will be developed along two main directions: • Building gateways with the public and • Inspiring the next generations of scientists. They will both continue traditional initiatives (OPEN GATES, "Science Fest", "FAPT") and introduce new forms of communication/outreach, targetting the lay public as well as school and university students.



Along the lines mentioned here, IFIN-HH will continue to develop its infrastructure, manpower, and expertise. Bringing bright young people at the frontiers of Science and blending their enthusiasm with the experience and educated tenacity of the elder is believed to make a sure recipe to guarantee a long-term sustainability of our plans.

A good opportunity in this respect will be offered by the main scientific event of 2012: the second edition of the European Nuclear Physics Conference (**EuNPC2012**), to be organized by the Nuclear Physics Board of the European Physical Society in Romania, with IFIN-HH as local organizer. It will be a **blend of plenary talks given by outstanding personalities in the field of Nuclear Physics and contributions of young researchers and students, with a strong impact on future international collaborations in nuclear physics and an important contribution** to enhancing the visibility of Romanian physics.

Scientific papers published in journals with non-zero relative Article Influence Score (authors members of the unit and the journal title will be highlighted in bold font)

No.	Team	Label A#	Dept.	The reference (Authors, Article title, Journal title, Volume, Page, Year) (1)	Year of appearance (2)	ISI journal title	Relative AIS	Number of ISI citations
1	E1	-A 1	DFT	**D.S. Delion**, J. Suhonen, Microscopic Anharmonic Vibrator Approach for beta decays, **Nuclear Physics A**, 781, 88, 2007	2007	NUCLEAR PHYSICS A	1,09321	9
2	E1	-A 2	DFT	S. Peltonen, **D.S. Delion**, J. Suhonen, Folding description of the fine structure of alpha decay to 2+ vibrational and transitional states, **Physical Review C**, 75, 054301, 2007	2007	Physical Review C	1,24767	0
3	E1	-A 3	DFT	**D.S. Delion**, R.J. Liotta, R. Wyss, Alpha decay of high spin isomers in superheavy nuclei, **Physical Review C**, 76, 044301, 2007	2007	Physical Review C	1,24767	0
4	E1	-A 4	DFT	S. Peltonen, **D.S. Delion**, J. Suhonen, Alpha decay spectroscopy of deformed nuclei reexamined, **Physical Review C,** 78, 034608, 2008	2008	Physical Review C	1,24767	0
5	E1	-A 5	DFT	**D.S. Delion**, Alpha decay versus alpha clustering, **International Journal of Modern Physics E**, 17, 2283, 2008	2008	International Journal of Modern Physics E	0,26099	4
6	E1	-A 6	DFT	J. Kotila, J. Suhonen, **D.S. Delion**, Two-neutrino double beta decay of 76-Ge in an Anharmonic Vibrator Approach, **Journal of Physics G,** 36, 045106, 2009	2009	J PHYS G NUCL PARTIC	1,00000	6
7	E1	-A 7	DFT	**D.S. Delion**, Universal decay rule for reduced widths, **Physical Review C**, 80, 024310, 2009	2009	Physical Review C	1,24767	0
8	E1	-A 8	DFT	J. Kotila, J. Suhonen, **D.S. Delion**, Description of the two-neutrino double beta decay of 100-Mo by pnMAVA, **Journal of Physics G**, 37, 015101, 2010	2010	J PHYS G NUCL PARTIC	1,00000	0
9	E1	-A 9	DFT	A. Astier, P. Petkov, M.-G. Porquet, **D.S. Delion**, and P. Schuck, A novel manifestation of α-clustering structures: new 'α + 208Pb' states in 212Po revealed by their enhanced E1 decays, **Physical Review Letters**, 104, 042701, 2010	2010	PHYSICAL REVIEW LETTERS	7,98625	1
10	E1	-A 10	DFT	A. Astier, P. Petkov, M.-G. Porquet, **D.S. Delion**, and P. Schuck, Enhanced E1 decays measured in 212Po populated by α transfer: a novel manifestation of α-clustering, Modern Physics Letters A, 25, 21, 2010	2010	Modern Physics Letters A	0,55713	0
11	E1	-A 11	DFT	**D.S. Delion**, R. Wyss, R.J. Liotta, Bo Cederwall, A. Johnson, and M. Sandelius, Investigation of proton-neutron correlations close to the drip line, **Physical Review C**, 82, 024307, 2010	2010	Physical Review C	1,24767	0
12	E1	-A 12	DFT	**D.S. Delion** and N.V. Zamfir, Systematics of 2+1 states in semi-magic nuclei, Physical Review C, 82, 031302, 2010	2010	Physical Review C	1,24767	0
13	E1	-A 13	DFT	A. Astier, P. Petkov, M.-G. Porquet, **D.S. Delion**, and P. Schuck, Coexistence of 'α + 208Pb' cluster structures and single-particle excitations in 212Po, **European Physical Journal A**, 46, 165, 2010	2010	European Physical Journal A	1,10519	3
14	E1	-A 14	DFT	**M. Mirea**, L. Tassan-Got, C. Stephan, C.O. Bacri and R.C. Bobulescu, Landau-Zener effect in fission, Physical Review C, 76, 064608, 2007	2007	Physical Review C	1,24767	0
15	E1	-A 15	DFT	**M. Mirea**, Time-dependent pairing equations for seniority-one nuclear systems, **Physical Review C**, 78, 044618, 2008	2008	Physical Review C	1,24767	0
16	E1	-A 16	DFT	**M. Mirea, D.S. Delion** and A. Sandulescu, Cold Valleys for Fission/Fusion Superheavy Elements Beyond Z=118, **EPL**, 85, 12001, 2009	2009	EPL – Europhys Lett	2,99656	3
17	E1	-A 17	DFT	**M. Mirea,** New dynamical pair breaking effect, **Physics Letters B**, 680, 316, 2009	2009	PHYSICS LETTERS B	3,62428	0
18	E1	-A 18	DFT	**M. Mirea, D.S. Delion** and A. Sandulescu, Microscopic cold fission yields of 252Cf, **Physical Review C**, 81, 044317, 2010	2010	Physical Review C	1,24767	3
19	E1	-A 19	DFT	**M. Mirea,** and R.C. Bobulescu, Cranking mass parameters for fission, **Journal of Physics G**, 37, 055106, 2010	2010	J PHYS G NUCL PARTIC	1,00000	0
20	E1	-A 20	DFT	**M. Mirea** and L. Tassan-Got, Th and U fission barriers within the Woods-Saxon two center shell model, **Central European Journal of Physics,** 9, 116-122, 2011	2011	Central Eur. J. Phys.	0,48339	3
21	E1	-A 21	DFT	**M. Mirea,** Energy partition in low energy fission, **Physical Review C**, 83, 054608, 2011	2011	Physical Review C	1,24767	5
22	E1	-A 22	DFT	**M. Mirea**, A. Sandulescu, and **D.S. Delion**, Predictions for 232U cluster-decay within the macroscopic-microscopic approximation, **Nuclear Physics A**, 870-871, 23, 2011	2011	NUCLEAR PHYSICS A	1,09321	1
23	E1	-A 23	DFT	G. Giubrone, J. L. Tain, C. Lederer, A. Pavlik, A. Wallner, S. Andriamonje, M. Brugger, M. Calviani, F. Cerutti, E. Chiaveri, A. Ferrari, Y. Kadi, E. Lebbos, V. Vlachoudis, J. Andrzejewski, J. Marganiec, J. Perkowski, L. Audouin, B. Berthier, L. Tassan-Got, V. Avrigeanu, **M. Mirea**, V. Becares, D. Cano-Ott, M. Fernandez-Ordonez, E. Gonzalez-Romero, C. Guerrero, F. Martin-Fuertes, T. Martinez, E. Mendoza, G. Pina, J. Quinones, F. Becvar, M. Krticka, F. Belloni, P. M. Milazzo, E. Berthoumieux, F.	2011	J. Korean Phys. Soc.	0,28408	1
24	E1	-A 24	DFT	E. Mendoza, V. Becares, A. Casado, D. Cano-Ott, M. Fernandez-Ordonez, E. Gonzalez-Romero, C. Guerrero, T. Martinez, J. J. Vidriales, J. Andrzejewski, J. Marganiec, J. Perkowski, L. Audouin, B. Berthier, L. Tassan-Got, V. Avrigeanu, **M. Mirea**, F. Becvar, M. Krticka, F. Belloni, P. M. Milazzo, E. Berthoumieux, F. Gunsing, F. Calvino, G. Cortes, M. B. Gomez-Hornillos, S. Andriamonje, M. Brugger, M. Calviani, F. Cerutti, E. Chiaveri, A. Ferrari, Y. Kadi, E. Lebbos, R. Losito, V. Vlachoudis, C.	2011	J. Korean Phys. Soc.	0,28408	0
25	E1	-A 25	DFT	C. Guerrero, V. Becares, D. Cano-Ott, M. Fernandez-Ordonez, E. Gonzalez-Romero, F. Martin-Fuertes, T. Martinez, E. Mendoza, G. Pina, J. Quinones, V. Vlachoudis, M. Calviani, S. Andriamonje, M. Brugger, F. Cerutti, E. Chiaveri, A. Ferrari, Y. Kadi, E. Lebbos, E. Berthoumieux, F. Gunsing, J. Andrzejewski, J. Marganiec, J. Perkowski, L. Audouin, B. Berthier, L. Tassan-Got, V. Avrigeanu, **M. Mirea,** F. Becvar, M. Krticka, F. Belloni, P. M. Milazzo, F. Calvino, G. Cortes, M. B. Gomez-Hornillos, C.	2011	J. Korean Phys. Soc.	0,28408	0
26	E2	-A 2	DFT	**M. Apostol**, The condensation of matter-a model of phase transition of the first kind, **Mod. Phys. Lett B21** 893 (2007)	2007	Modern Physics Letters A	0,55713	1
27	E2	-A 6	DFT	**M. Apostol,** A new approach to the quantized electrical conductance, **Phys. Lett. A372** 5093 (2008)	2008	PHYS LETT A	1,59679	4
28	E2	-A 11	DFT	**M Apostol**, Generalized theory of thermoelectric figure of merit, **J. Appl. Phys**. 104 053704 (2008)	2008	J. Appl. Phys	1,84989	0
29	E2	-A 11	DFVM	**Apostol M., Preoteasa E.,** Density oscillations in a model of water and other similar liquids, **Phys. Chem. Liq.**, 46(6), 653- 668 (2008)	2008	Phys. Chem. Liq	0,30406	3
30	E2	-A 13	DFT	**M Apostol**, A model for the thermodynamics of simple liquids, **Physica B403** 3946 (2008)	2008	Physica **B**	0,61001	0
31	E2	-A 14	DFT	**M Apostol and E Preoteasa**, Density oscillations in a model of water and other similar liquids, **Phys.&Chem. Liquids** 46 653 (2008)	2008	Modern Physics Letters A	0,55713	0
32	E2	-A 15	DFT	**M Apostol**, Coherence domains in matter interacting with radiation, **Phys. Lett. A373** 379 (2009)	2009	PHYS LETT A	1,59679	5
33	E2	-A 16	DFT	**M Apostol**, Dynamics of collective density modes in multi-component molecular mixtures, **Phys.&Chem. Liquids 47** 35 (2009)	2009	Modern Physics Letters A	0,55713	0

34	E2 -A 17	DFT	**O A Dobrescu, L C Cune and M Apostol**, Electric flow through an ideal ferromagnet-superconductor junction, **Physica C469** 273 (2009)	2009	Physica **C**	0,75264	5
35	E2 -A 18	DFT	**M Apostol and G Vaman,** Electromagnetic field interacting with a semi-infinite plasma, **J. Opt. Soc. Am**. **A26** 1747 (2009)	2009	J. Opt. Soc. Am. A	1,85862	0
36	E2 -A 19	DFT	**M Apostol and G Vaman**, Reflection and refraction of the electromagnetic field in a semi-infinite plasma, **Optics. Commun.** 282 4329 (2009)	2009	Optics. Commun.	1,24006	5
37	E2 -A 20	DFT	**M Apostol and G Vaman**, Reflected and refracted of the electromagnetic fielda in a semi-infinite body, **Solid State Commun.** 149 1936 (2009)	2009	Solid State Commun.	1,4	0
38	E2 -A 21	DFT	**M Apostol and G Vaman,** Plasmons and polaritons in a semi-infinite plasma and a plasma slab, **Physica B404** 3775 (2009)	2009	Physica **B**	0,61001	2
39	E2 -A 22	DFT	**M Apostol and G Vaman**, Plasmons and diffraction of an electromagnetic plane wave by a metallic sphere, **Progr. Electrom. Res.** (PIER) **98** 97 (2009)	2009	Progr. Electrom. Res.	1,76	3
40	E2 -A 23	DFT	**M Apostol and G Vaman,** Electromagnetic eigenmodes in matter. Van der Waals-London and Casimir forces, **Progr. Electrom. Res. (PIERB**) **B19** 115 (2010)	2010	Progr. Electrom. Res.	1,76	7
41	E2 -A 24	DFT	**M Apostol** and M Nedelcu**,** Pulsed thermoelectricity, **J. Appl. Phys.** 108 023702 (2010)	2010	J. Appl. Phys	1,84989	0
42	E2 -A 27	DFT	**M Apostol** and M Ganciu, Coherent polarization driven by external electromagnetic fields, **Phys. Lett. A374** 4848 (2010)	2010	PHYS LETT A	1,59679	3
43	E2 -A 28	DFT	**M Apostol** and M Ganciu, Polaritonic pulse and coherent X- and gamma rays from Compton (Thomson) backscattering, **J. Appl. Phys. 109** 013307 (2011)	2011	J. Appl. Phys	1,84989	0
44	E2 -A 29	DFT	**M Apostol**, Dynamics of electron-positron pairs in a vacuum polarized by an external radiation field, J. Mod. Optics. 58, 611 (2011)	2011	J. Mod. Optics	1,09	0
45	E2 -A 30	DFT	**N. Angelescu, R.A. Minlos, J. Ruiz, V.A. Zagrebnov, Lower spectral branches of a spin-boson model, J. Math. Phys., 49, 102105, 2008**	2008	J. Math. Phys.	0,83164	0
46	E2 -A 31	DFT	**N. Angelescu, M. Bundaru,** On the transport between condensed phases, **J. Phys. A: Math. Theor.**, 40, 5565, 2007	2007	J PHYS A-MATH THEOR	1,54639	0
47	E3 -A 1	DFT	B. Grammaticos, A. Ramani, K. M. Tamizhmani, T. Tamizhmani, **A. S. Carstea**, Do integrable cellular automata have the confining property?, **J. Physics A: Math**.**Theor.** 40,F725, 2007	2007	J PHYS A-MATH THEOR	1,54639	4
48	E3 -A 2	DFT	**A. S. Carstea,** A. Ramani, K. M. Tamizhmani, B. Grammaticos, Proteomic signals in simple transcriptional cascades, **Chaos Solitons Fractals**, 41, 1823, 2009	2009	Chaos Solitons Fractals,	1,23482	0
49	E3 -A 3	DFT	B. Grammaticos, **A. S. Carstea,** A. Ramani, On the non-autonomouys form of the Q4 mapping and its relation with elliptic Painleve equation, **J. Physics A: Math**. **Theor.** 42,322003, 2009	2009	J PHYS A-MATH THEOR	1,54639	0
50	E3 -A 4	DFT	**A. S. Carstea**, Integrable syustems related to Su-Schrieffer-Heeger lattices, **Chaos Solitons Fractals**, 42, 923, 2009	2009	Chaos Solitons Fractals,	1,23482	4
51	E3 -A 5	DFT	**A. S. Carstea**, A. Ramani, B. Grammaticos,Deautonomizing non-QRT mappings, **Journal of Physics A: Math. Theor,** 42, 485207, 2009	2009	J PHYS A-MATH THEOR	1,54639	1
52	E3 -A 6	DFT	**A. S. Carstea, D. Grecu, A. T. Grecu,** Proteomic signals in modular transcriptional cascades; discrete time and cellular automata approach, **Physica D**, 239, 967, 2010	2010	Physica D	2,19244	7
53	E3 -A 7	DFT	**A. S. Carstea,** Bilinear approach to delay-Painleve equations, **Journal of Physics A: Math. Theor.**44, 105202, 2011	2011	J PHYS A-MATH THEOR	1,54639	0
54	E3 -A 8	DFT	**D. Grecu, A. Visinescu,** Madelung fluid description of generalised derivative NLS, **Theor. Math. Physics**, 160,1066, 2009	2009	Theor. Math. Physics	0,7	1
55	E3 -A 9	DFT	R. Fedele, S. de Nicola, D. Ivanovic, **D. Grecu, A. Visinescu** On the Mapping Connecting the Cylindrical Nonlinear von Neumann Equation with the Standard von Neumann Equation **J. Plasma Physics**, (2010), 76,645	2010	J. Plasma Physics	0,38245	0
56	E3 -A 10	DFT	E. Radu, **M. Visinescu**, A note on Klein-Gordon equation in a generalised Kaluza-Klein monopole background, **Modern Physics Letters A,** 22, 1621, 2007	2007	Modern Physics Letters A	0,55713	0
57	E3 -A 11	DFT	I. I. Cotaescu, **M. Visinescu**, Infinite loop superalgebras of the Dirac theory in euclidean Taub-NUT space, **Journal of Physics A: Math-Theor**.40, 11987, 2007	2007	J PHYS A-MATH THEOR	1,54639	0
58	E3 -A 12	DFT	B. Saha, **M. Visinescu**, String cosmological model in the presence of magnetic flux, **Astrophysics and Space Science**, 315, 99, 2008	2008	Astrophysics and Space Science	0,54316	5
59	E3 -A 13	DFT	**M. Visinescu**, Higher order first integrals of motion in a gauge covariant hamiltonian framework, **Modern Physics Letters A,** 25, 341, 2010	2010	Modern Physics Letters A	0,55713	0
60	E3 -A 14	DFT	**M. Visinescu,** Nonlinear symmetries on spaces admitting Killing tensors, **Physics of Atomic Nuclei,** 15, 823, 2010	2010	Physics of Atomic Nuclei	0,25	4
61	E3 -A 15	DFT	**M. Visinescu,** Hidden conformal symmetries and quantum gravitational anomalies, **Europhysics Letters**, 90, 41002, 2010	2010	EPL – Europhys Lett	2,99656	9
62	E3 -A 16	DFT	B. Saha**, M. Visinescu,** Bianchi type I model with cosmic string in the presence of magnetic field; spinor description, **Int. Journal of Theor. Physics**, 49, 1411, 2010	2010	Int. Journal of Theor. Physics	0,49823	1
63	E3 -A 17	DFT	**M. Visinescu**, Covariant approach of the dynamics of particles in External gauge fields, Killing tensors and quantum gravitational anomalies, **Symmetry Integrability and Geometry**, 7, 037, 2011	2011	Symmetry Integrability and Geometry	0,64097	0

64	E4 -A 1	DFT	**D. N. Poenaru, R. A. Gherghescu,** W. Greiner, Heavy particle radioactivity of superheavy nuclei, **Physical Review Letters** 107, 062503 (2011).	2011	PHYSICAL REVIEW LETTERS	7,98625	1
65	E4 -A 2	DFT	**D. N. Poenaru, R. A. Gherghescu,** W. Greiner, Simple relationships for alpha-decay half-lives, **Journal of Physics G 38,** in print (2011).	2011	J PHYS G NUCL PARTIC	1,00000	0
66	E4 -A 3	DFT	**D. N. Poenaru, R. A. Gherghescu,** W. Greiner, Single universal curve for cluster radioactivity, **Physical Review C83,** 014601 (2011).	2011	Physical Review C	1,24767	3
67	E4 -A 4	DFT	**R. A. Gherghescu, D. N. Poenaru** et al., Hemispheroidal atomic clusters on planar surfaces, **Physica E**42, 1555 (2010).	2010	PHYSICA E	0,75732	1
68	E4 -A 5	DFT	**R. A. Gherghescu, D. N. Poenaru** et al., Spheroidal cap configurations of atomic clusters on planar surfaces, **European Physical Journal B77,** 123 (2010).	2010	European Physical Journal B	1,27290	32
69	E4 -A 6	DFT	**D. N. Poenaru, R. A. Gherghescu et al.**, Charge density influence on macroscopic deformation energy, **International Journal of Modern Physics E19,** 1411 (2010)	2010	International Journal of Modern Physics E	0,26099	4
70	E4 -A 7	DFT	**D. N. Poenaru, R. A. Gherghescu,** W. Greiner, Individual and collective properties of fermions in nuclear and atomic cluster systems, **Journal of Physics G**37, 085101 (2010)	2010	J PHYS G NUCL PARTIC	1,00000	0
71	E4 -A 8	DFT	**D. N. Poenaru, R. A. Gherghescu,** W. Greiner, Stable spheroidal cap shapes of deposited atomic clusters, **International Journal of Modern Physics B24,** 3411 (2010)	2010	International Journal of Modern Physics B	0,33615	0
72	E4 -A 9	DFT	**D. N. Poenaru,** W. Greiner, Extension of superasymmetric fission theory from cluster decay to nanophysics, **Nuclear Physics A**834, 163c (2010).	2010	NUCLEAR PHYSICS A	1,09321	15
73	E4 -A 10	DFT	**D. N. Poenaru, R. A. Gherghescu,** W. Greiner, Special properties of 264Fm and of atomic clusters emitting charged trimers, **Journal of Physics G** 36, 125101 (2009).	2009	J PHYS G NUCL PARTIC	1,00000	2
74	E4 -A 11	DFT	**D. N. Poenaru, R. A. Gherghescu et al.,** Oblate equilibrium shapes of hemispheroidal atomic clusters, **EPL** 88, 23002 (2009).	2009	EPL – Europhys Lett	2,99656	16
75	E4 -A 12	DFT	**R. A. Gherghescu, N. Carjan,** Two and three fragment emission from Z=120 isotopes, **Journal of Physics G 36,** 025106 (2009).	2009	J PHYS G NUCL PARTIC	1,00000	0
76	E4 -A 13	DFT	**D. N. Poenaru, R. A. Gherghescu,** et al, Macroscopic-microscopic theory of semi-spheroidal atomic clusters, **European Physical Journal D 47,** 379 (2008).	2008	European Physical Journal A	1,10519	0
77	E4 -A 14	DFT	**D. N. Poenaru, R. A. Gherghescu,** et al., Hemispherodial quantum harmonic oscillator, **Physics Letters A372,** 5448 (2008).	2008	PHYS LETT A	1,59679	1
78	E4 -A 15	DFT	**R. A. Gherghescu, D. N. Poenaru,** W. Greiner, Deformed shell closures for light atomic clusters, **International Journal of Modern Physics B22,** 4917 (2008).	2008	International Journal of Modern Physics B	0,33615	1
79	E4 -A 16	DFT	**R. A. Gherghescu, D. N. Poenaru, N. Carjan,** Neck influence on fission paths, **Physical Review C77,** 044607 (2008).	2008	Physical Review C	1,24767	0
80	E4 -A 17	DFT	**R. A. Gherghescu, D. N. Poenaru,** W. Greiner, Proton gap due to the necking potential, **Physical Review C78,** 024604 (2008).	2008	Physical Review C	1,24767	0
81	E4 -A 18	DFT	**D. N. Poenaru,** W. Greiner, Cluster radioactivity – past, present and future. **International Journal of Modern Physics E17,** 529 (2008)	2008	International Journal of Modern Physics E	0,26099	2
82	E4 -A 19	DFT	**R. A. Gherghescu, D. N. Poenaru,** W. Greiner, Binary and ternary emissiion from superheavy nuclei, **International Journal of Modern Physics E17,** 2221 (2008).	2008	International Journal of Modern Physics E	0,26099	2
83	E4 -A 20	DFT	**D. N. Poenaru, R. A. Gherghescu et al.,** Liquid drop stability of a superdeformed prolate semi-spheroidal atomic cluster, **EPL 79,** 63001 (2007).	2007	EPL – Europhys Lett	2,99656	21
84	E4 -A 21	DFT	**D. N. Poenaru, R. A. Gherghescu,** et al., Heavy particle radioactivities, **International Journal of Modern Physics E16,** 995 (2007)	2007	International Journal of Modern Physics E	0,26099	1
85	E4 -A 22	DFT	**D. N. Poenaru, R. A. Gherghescu, N. Carjan,** Alpha-decay lifetimes semiempirical relationship including shell effects, **EPL 77,** 62001 (2007).	2007	EPL – Europhys Lett	2,99656	4
86	E4 -A 23	DFT	R. Aaij, ...,**S. Stoica** et al, LHCb-collaboration: Prompt production in pp collisions at LHCb collaboration, **Physics Letters B** 693, 69 (2010).	2011	PHYSICS LETTERS B	3,62428	1
87	E4 -A 24	DFT	R. Aaij, ..., **S. Stoica,** et al, Measurement of sigma (pp->b(b)/X) at root s=7 TeV in the forward region, **Physics Letters B** 694, 209 (2010).	2010	PHYSICS LETTERS B	3,62428	4
88	E4 -A 25	DFT	A. Negoita, J. P. Vary, **S. Stoica,** No-core shell model for A=47 and A=49, **Journal of Physics G 37,** 055109 (2010)	2010	J PHYS G NUCL PARTIC	1,00000	0
89	E4 -A 26	DFT	M. Horoi, **S. Stoica,** Shell model analysis of neutrinoless double beta decay of 48Ca, **Physical Review C 81,** 024321 (2010)	2010	Physical Review C	1,24767	1
90	E4 -A 27	DFT	J. P. Vary, S. Popescu, **S. Stoica,** P. Navratil, No-core shell model calculations for 48Ca and Ti48, **Journal of Physics G 36,** 085103 (2009).	2009	J PHYS G NUCL PARTIC	1,00000	0
91	E4 -A 28	DFT	**S. Stoica,** B. Pastrav, J. E. Horvath, M. P. Allen, Pion mass effects on axion emission from neutron stars through bremsstrahlung processes, **Nuclear Physics A 828,** 439 (2009).	2009	NUCLEAR PHYSICS A	1,09321	1
92	E4 -A 29	DFT	LHCb collab., ..., **S. Stoica,**...,The LHCb detector at the LHC, **JINST 3,** S08005 (2008).	2008	J INST	1,32	1
93	E4 -A 30	DFT	M. Horoi, **S. Stoica,** B. A. Brown, Shell model calculations of the two-neutrino double-beta decay rates of 48Ca with GXPFIA interaction, **Physical Review C 75,** 034302 (2007).	2007	Physical Review C	1,24767	0

94	E5 -A 02	DPETI	**Gh. Adam, S. Adam**, Separation of the spin-charge correlations in the two-band Hubbard model of high-Tc superconductivity, JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS, Vol. 10, No. 7, pp. 1666-1670 (July 2008)	2008	J OPTOELECTRON ADV M	0,32990	0
95	E5 -A 1	DFT	**A. C. Gheorghe, A. A. Raduta and A. Faessler**, Solvable models for the gamma deformation having X(5) as limiting symmetry. Removing some drawbacks of the existent descriptions, **Phys. Lett. B 648 (2007) 171-175.**	2007	PHYSICS LETTERS B	3,62428	0
96	E5 -A 2	DFT	**A. A. Raduta, C. M. Raduta**, Double beta decay to the first 2^+ state within a boson expansion formalism with a prjected spherical single particle basis, **Phys. Lett. B 647 (2007) 265-270**.	2007	PHYSICS LETTERS B	3,62428	0
97	E5 -A 3	DFT	**A. A. Raduta and F.D. Aaron**, A simple description of the states 0^+ and 2^+ in ^{168}Er, **Jour. Phys. G. 34 (2007) 2053-2061**	2007	J PHYS G NUCL PARTIC	1,00000	2
98	E5 -A 4	DFT	**C. M. Raduta, A. A. Raduta**, Unified descriptionof the double beta decay to the first quadrupole phonon state in spherical and deformed nuclei, **Phys. Rev. C 76, 044306, (2007).**	2007	Physical Review C	1,24767	1
99	E5 -A 5	DFT	**A.A.Raduta, R. Budaca, C.M.Raduta**, Semiclassical description of a triaxial rigid rotor, **Phys.Rev.C, 76, 064309, (2007)**.	2007	Physical Review C	1,24767	1
100	E5 -A 6	DFT	**A. H. Raduta, M. Colonna, M. Di Toro**, Searching for statistical equilibrium in a dynamical multifragmentation path, **Phys. Rev. C 76, 024602 (2007).**	2007	Physical Review C	1,24767	0
101	E5 -A 7	DFT	**M.B. Tsang,…, Al. H. Raduta** et al., Comparison of statistical multifragmentation and evaporation models for heavy ion collisions, **The European Physical Journal A, 32, (2007) 243**.	2007	European Physical Journal A	1,10519	7
102	E5 -A 8	DFT	**A. A. Raduta, R. Budaca, Al. H. Raduta**, Colective dipole excitations in sodium clusters, **Phys. Rev. A.79, 023202 (2009).**	2009	PHYSICAL REVIEW A	3,08984	0
103	E5 -A 9	DFT	**A. A. Raduta, C. M. Raduta, E. Moya de Guerra, P. Sarriguren,** Remarks on monopole charge properties within the generalized Coherent State Model, **Jour. Phys. G 36 (2009) 015114**	2009	J PHYS G NUCL PARTIC	1,00000	0
104	E5 -A 10	DFT	**A. A. Raduta, F. D. Aaron, E. Moya de Guerra and Amand Faessler**,Phenomenological description of the states 0+ and 2+ in some even-even nuclei, **Jour. Phys. G. 36 (2009) 055101 (25 pp)**	2009	J PHYS G NUCL PARTIC	1,00000	0
105	E5 -A 11	DFT	**A. A. Raduta, A. C. Gheorghe, P. Buganu and A. Faessler,** A solvable model which has X(5) as a limiting symmetry and removes some inherent drawbacks, **Nucl. Phys. A. 819 (2009) 46-78**.	2009	NUCLEAR PHYSICS A	1,09321	15
106	E5 -A 12	DFT	**A. A. Raduta, C. M. Raduta, Amand Faessler**, The CSM extension to the odd-even octupole deformed nuclei, **Phys. Rev. C 80, 044327 (2009).**	2009	Physical Review C	1,24767	2
107	E5 -A 13	DFT	**A. A. Raduta and R. Budaca**, Sum rule for a Schiff-like dipole moment,**Int. Jour. Mod. Phys. B, Atomic, Molecular and Optical Physics, 25 (2011) 467-478.**	2011	Jour. Mod. Phys. B	0,34	7
108	E5 -A 14	DFT	**A. A. Raduta, A. C. Gheorghe, P. Buganu and** A. Faessler, A solvable model which has X(5) as a limiting symmetry and removes some inherent drawbacks, **Nucl. Phys. A** 819, 46, 2009	2009	NUCLEAR PHYSICS A	1,09321	0
109	E5 -A 14	DFT	**C. M. Raduta and A. A. Raduta**, Description of the 2□□□ decay within a fully renormalized pnQRPA approach with a restored gauge symmetry, **Phys. Rev. C, 82, 068501 (2010).**	2010	Physical Review C	1,24767	0
110	E5 -A 15	DFT	**C. M. Raduta and A. A. Raduta**, Description of the 2$\nu\beta\beta$ decay within a fully renormalized pnQRPA approach with a restored gauge symmetry, **Journal of Physics G; Nucl. Part. Physics, 38 (2011) 055102**.	2011	J PHYS G NUCL PARTIC	1,00000	0
111	E5 -A 16	DFT	**A. A. Raduta, R. Budaca and Amand Faessler**, Closed formulas for ground band energies of nuclei with various symmetries,**Jour. Phys. G; Nucl. Part. Phys,37 (2010) 085108**.	2010	J PHYS G NUCL PARTIC	1,00000	0
112	E5 -A 18	DFT	**A. A. Raduta, P. Buganu**, Towards a new description of triaxial nuclei, **Phys. Rev. C, 83 (2011) 034313.**	2011	Physical Review C	1,24767	2
113	E5 -A 19	DFT	**A. A. Raduta, R. Budaca,** Semi-microscopic description of the backbending phenomena in some deformed even-even nuclei, **PhysRevC, 84, 004323 (2011).**	2011	Physical Review C	1,24767	6
114	E5 -A 28	DFT	**I Baran, C. Ganea, …, I. I. Ursu, et al**, Hydrogen peroxid and Quercitine on Apoptosis and Delayed Luminiscence of HumanLeukema Jurkat T-Cells, **Cell Biochemistry and Biophysics, 58 (2010), p 169-179**	2010	Cell Biochemistry and Biophysics	1,16923	18
115	E5 -A 30	DFT	M. I. Krivoruchenko, A. Faessler, **A. A. Raduta** and C. Fuchs, Underlying gauge symmetries of systems with second class constraints, **Int. Jour. Mod. Phys. A**, 22, 4 (2007) 787-833	2007	International Journal of Modern Physics A	0,39148	1
116	E5 -A 31	DFT	**A. A. Raduta and R. Budaca, A. Faessler,** Analytical description of the Coherent State Model for near vibrational and well deformed nuclei, Annals of Physics, **NY,http://dx,doi.org/10.1016/j.aop.2011.10.004**	2011	Annals of Physics	4,05	0
117	E5 -A 41	DFT	**R.A. Gherghescu, D.N. Poenaru, M.-C. Raportaru, B. Popovici**, **W. Greiner,** Charge density influence on macroscopic deformation energy, INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS, vol. 19, 1411 (2010)	2010	INT J MOD PHYS E	0,26099	3
118	E5 -A 6-01	DPETI	**Gh. Adam**, **S. Adam**, Rigorous derivation of the mean field Green functions of the two-band Hubbard model of superconductivity, JOURNAL OF PHYSICS A-MATHEMATICAL AND THEORETICAL, Vol. 40, pp. 11205-11219 (2007)	2007	J PHYS A-MATH THEOR	1,54639	2
119	E6 -A 1	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Stable discrete surface light bullets, **Optics Express**, 15, 589, 2007	2007	Optics Express	3,7050	11
120	E6 -A 2	DFT	B.A. Malomed, F. Lederer, **D. Mazilu**, **D. Mihalache,** On stability of vortices in three-dimensional self-attractive Bose-Einstein condensates, **Phys. Lett. A**, 361, 336, 2007	2007	PHYS LETT A	1,59679	0
121	E6 -A 3	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, H. Leblond, B.A. Malomed, Stability of dissipative optical solitons in the three-dimensional cubic-quintic Ginzburg-Landau equation, **Phys. Rev. A**, 75, 033811, 2007	2007	PHYSICAL REVIEW A	3,08984	2
122	E6 -A 4	DFT	A.S. Desyatnikov, **D. Mihalache, D. Mazilu**, B.A. Malomed, F. Lederer, Stable counter-rotating vortex pairs in saturable media, **Phys. Lett. A**, 364, 231, 2007	2007	PHYS LETT A	1,59679	7
123	E6 -A 5	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Interface discrete light bullets in waveguide arrays, **Optics Letters**, 32, 2091, 2007	2007	Optics Letter	3,50221	17

124	E6 -A 6	DFT	H. Leblond, B.A. Malomed, **D. Mihalache,** Three-dimensional vortex solitons in quasi-two-dimensional lattices, **Phys. Rev. E**, 76, 026604, 2007	2007	Phys. Rev. E,	1,41582	0
125	E6 -A 7	DFT	**D. Mihalache, D. Mazilu**, Y. Kivshar, F. Lederer, Spatiotemporal discrete surface solitons in binary waveguide arrays, **Optics Letters**, 15, 10718, 2007	2007	Optics Letters	3,50221	3
126	E6 -A 8	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, H. Leblond, B.A. Malomed, Stability limits for three-dimensional vortex solitons in the Ginzburg-Landau equation with the cubic-quintic nonlinearity, **Phys. Rev. A**, 76, 045803, 2007	2007	PHYSICAL REVIEW A	3,08984	0
127	E6 -A 9	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Spatiotemporal surface solitons in two-dimensional photonic lattices, **Optics Letters**, 32, 3173, 2007	2007	Optics Letter	3,50221	7
128	E6 -A 87	DFT	**A.I. Nicolin, M.-C. Raportaru**, Faraday waves in high-density cigar-shaped Bose-Einstein condensates, PHYSICA A-STATISTICAL MECHANICS AND ITS APPLICATIONS, vol. 389, 4663 (2010)	2010	PHYSICA A	1,19588	2
129	E6 -A 88	DFT	E. De Lauro, S. De Martino, M. Falanga M., **L Gr. Ixaru**, Limit cycles in nonlinear excitation of clusters of classical oscillators, COMPUTER PHYSICS COMMUNICATIONS 180, 1832-1838 (2009)	2009	EUROPEAN PHYSICAL JOURNAL C	1,30361	4
130	E6 -A 89	DFT	**L. Gr. Ixaru**, Efficient computation of the Airy propagators, COMPUTER PHYSICS COMMUNICATIONS 176, 637-641 (2007)	2007	COMPUT PHYS COMMUN	2,17764	2
131	E6 -A 90	DFT	**L. Gr. Ixaru**, Fast LP method for the Schrodinger equation, COMPUTER PHYSICS COMMUNICATIONS 177, 897-907 (2007)	2007	COMPUT PHYS COMMUN	2,17764	0
132	E6 -A 91	DFT	D. Conte, E. Esposito, B. Paternoster, **L. Gr. Ixaru**, Some new uses of the eta(m)(Z) functions, COMPUTER PHYSICS COMMUNICATIONS 181, 128-137 (2010)	2010	COMPUT PHYS COMMUN	2,17764	20
133	E6 -A 92	DFT	**L.G. Ixaru**, New numerical method for the eigenvalue problem of the 2D Schrodinger equation. COMPUTER PHYSICS COMMUNICATIONS, 181 (10), pp. 1738-1742, 2010.	2010	COMPUT PHYS COMMUN	2,17764	33
134	E6 -A 93	DFT	R. D'Ambrosio, **L. Gr. Ixaru**, B. Paternoster, Construction of the ef-based Runge-Kutta methods revisited, COMPUTER PHYSICS COMMUNICATIONS 182, 322-329 (2011)	2011	COMPUT PHYS COMMUN	2,17764	3
135	E6 -A 94	DFT	**L. Gr. Ixaru**, Exactly solvable coupled-channel Schrodinger equation, PHYSICAL REVIEW A77, Article Number: 064102 (2008)	2008	PHYSICAL REVIEW A	3,08984	0
136	E6 -A 10	DFT	O. Takayama, L.C. Crasovan, S.K. Johansen, **D. Mihalache,** D. Artigas, L. Torner, Dyakonov surface waves: A review, **Electromagnetics**, 28, 126, 2008	2008	Electromagnetics	0,65871	11
137	E6 -A 11	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, H. Leblond, B.A. Malomed, Collisions between coaxial vortex solitons in the three-dimensional cubic-quintic complex Ginzburg-Landau equation, **Phys. Rev. A**, 77, 033817, 2008	2008	PHYSICAL REVIEW A	3,08984	3
138	E6 -A 12	DFT	Y.J. He, B.A. Malomed, **D. Mihalache,** H.Z. Wang, Tunable rotary orbits of matter-wave nonlinear modes in attractive Bose-Einstein condensates, **J. Phys. B-Atomic, Molec. Opt. Phys.**, 41, 055301, 2008	2008	J. Phys. B	2,0200	5
139	E6 -A 13	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Spatiotemporal surface Ginzburg-Landau solitons, **Phys. Rev. A**, 77, 043828, 2008	2008	PHYSICAL REVIEW A	3,08984	6
140	E6 -A 14	DFT	Y.J. He, B.A. Malomed, **D. Mihalache,** H.Z. Wang, Spinning bearing-shaped solitons in strongly nonlocal nonlinear media, **Phys. Rev. A**, 77, 043826, 2008	2008	PHYSICAL REVIEW A	3,08984	8
141	E6 -A 15	DFT	H. Leblond, B.A. Malomed, **D. Mihalache,** Spatiotemporal vortices in optical fiber bundles, **Phys. Rev. A**, 77, 063804, 2008	2008	PHYSICAL REVIEW A	3,08984	4
142	E6 -A 16	DFT	Y.J. He, B.A. Malomed, **D. Mihalache,** H.Z. Wang, Crescent vortex solitons in strongly nonlocal nonlinear media, **Phys. Rev. A**, 78, 023824, 2008	2008	PHYSICAL REVIEW A	3,08984	0
143	E6 -A 17	DFT	**D. Mihalache,** Three-dimensional dissipative optical solitons, **Central Eur. J. Phys.**, 6, 582, 2008	2008	Central Eur. J. Phys.	0,48339	0
144	E6 -A 18	DFT	H. Leblond, I.V. Mel'nikov, **D. Mihalache,** Interaction of few-optical-cycle solitons, **Phys. Rev. A**, 78, 043802, 2008	2008	PHYSICAL REVIEW A	3,08984	1
145	E6 -A 19	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Spatiotemporal dissipative solitons in two-dimensional photonic lattices, **Phys. Rev. E**, 78, 056602, 2008	2008	Phys. Rev. E,	1,41582	6

146	E6 -A 20	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, H. Leblond, B.A. Malomed, Collisions between counter-rotating solitary vortices in the three-dimensional Ginzburg-Landau equation, **Phys. Rev. E**, 78, 056601, 2008	2008	PHYSICAL REVIEW E	1,41582	1
147	E6 -A 21	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Collisions between discrete surface spatiotemporal solitons in nonlinear waveguide arrays, **Phys. Rev. A**, 79, 013811, 2009	2009	PHYSICAL REVIEW A	3,08984	2
148	E6 -A 22	DFT	H. Leblond, B.A. Malomed, **D. Mihalache,** Interactions of spatiotemporal solitons and vortices in fiber bundles, **Phys. Rev. A**, 79, 033841, 2009	2008	PHYSICAL REVIEW A	3,08984	0
149	E6 -A 23	DFT	F.W. Ye, **D. Mihalache,** B.B. Hu, Elliptic vortices in composite Mathieu lattices, **Phys. Rev. A**, 79, 053852, 2009	2009	PHYSICAL REVIEW A	3,08984	0
150	E6 -A 24	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Collisions between discrete spatiotemporal Ginzburg-Landau solitons, **Eur. Phys. J.-Spec. Top.**, 173, 267, 2009	2009	Eur. Phys. J.-Spec. Top.,	1,00802	9
151	E6 -A 25	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Spatiotemporal discrete Ginzburg-Landau solitons in two-dimensional photonic lattices, **Eur. Phys. J.-Spec. Topics**, 173, 255, 2009	2009	Eur. Phys. J.-Spec. Top.,	1,00802	3
152	E6 -A 26	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, H. Leblond, B.A. Malomed, Collisions between spinning and nonspinning co-axial three-dimensional Ginzburg-Landau solitons, **Eur. Phys. J.-Spec. Topics**, 173, 245, 2009	2009	Eur. Phys. J.-Spec. Top.,	1,00802	8
153	E6 -A 27	DFT	H. Leblond, **D. Mihalache,** Few-optical-cycle solitons: Modified Korteweg-de Vries sine-Gordon equation versus other non-slowly-varying-envelope-approximation models, **Phys. Rev. A**, 79, 063835, 2009	2009	PHYSICAL REVIEW A	3,08984	3
154	E6 -A 28	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, Y.S. Kivshar, Discrete light bullets in two-dimensional photonic lattices: Collision scenarios, **Opt. Commun.**, 282, 3000, 2009	2009	Optics. Commun.	1,24006	5
155	E6 -A 29	DFT	H. Leblond, B.A. Malomed, **D. Mihalache,** Stable vortex solitons in the Ginzburg-Landau model of a two-dimensional lasing medium with a transverse grating, **Phys. Rev. A**, 80, 033835, 2009	2009	PHYSICAL REVIEW A	3,08984	4
156	E6 -A 30	DFT	Y.J. He, B.A. Malomed, **D. Mihalache,** B. Liu, H.C. Huang, H. Yang, H.Z. Wang, Bound states of one-, two-, and three-dimensional solitons in complex Ginzburg-Landau equations with a linear potential, **Optics Lett.**, 34, 2976, 2009	2009	Optics Letter	3,50221	5
157	E6 -A 31	DFT	H. Leblond, D. Kremer, **D. Mihalache,** Ultrashort spatiotemporal optical solitons in quadratic nonlinear media: Generation of line and lump solitons from few-cycle input pulses, **Phys. Rev. A**, 80, 053812, 2009	2009	PHYSICAL REVIEW A	3,08984	2
158	E6 -A 32	DFT	**D. Mihalache,** D. Mazilu, F. Lederer, Collisions between discrete spatiotemporal dissipative Ginzburg-Landau solitons in two-dimensional photonic lattices, **Central Eur. J. Phys.**, 8, 77, 2010	2010	Central Eur. J. Phys.	0,48339	0
159	E6 -A 33	DFT	J.F. Zhang, L. Wu, L. Li, **D. Mihalache,** B.A. Malomed, Vortices and ring dark solitons in nonlinear amplifying waveguides, **Phys. Rev. A**, 81, 023836, 2010	2010	PHYSICAL REVIEW A	3,08984	0
160	E6 -A 34	DFT	**D. Mihalache, D. Mazilu**, F. Lederer, H. Leblond, B.A. Malomed, Spatiotemporal solitons in the Ginzburg-Landau model with a two-dimensional transverse grating, **Phys. Rev. A**, 81, 025801, 2010	2010	PHYSICAL REVIEW A	3,08984	1
161	E6 -A 35	DFT	H. Leblond, D. Kremer, **D. Mihalache,** Collapse of ultrashort spatiotemporal pulses described by the cubic generalized Kadomtsev-Petviashvili equation, **Phys. Rev. A**, 81, 033824, 2010	2010	PHYSICAL REVIEW A	3,08984	0
162	E6 -A 36	DFT	F. Ye, **D. Mihalache,** B. Hu, N.C. Panoiu, Subwavelength plasmonic lattice solitons in arrays of metallic nanowires, **Phys. Rev. Lett.**, 104, 106802, 2010	2010	PHYSICAL REVIEW LETTERS	7,98625	0
163	E6 -A 37	DFT	F.W. Ye, L.W. Dong, B.A. Malomed, **D. Mihalache,** B.B. Hu, Elliptic vortices in optical waveguides and self-attractive Bose-Einstein condensates, **J. Opt. Soc. Amer. B-Opt. Phys.**, 27, 757, 2010	2010	J. Opt. Soc. Amer. B-Opt. Phys.	2,21208	0
164	E6 -A 38	DFT	Y.J. He, **D. Mihalache,** B.B. Hu, Soliton drift, rebound, penetration, and trapping at the interface between media with uniform and spatially modulated nonlinearities, **Optics Lett.**, 35, 1716, 2010	2010	Optics Letter	3,50221	9
165	E6 -A 39	DFT	Y.J. He, B.A. Malomed, **D. Mihalache,** F.W. Ye, B.B. Hu, Generation of arrays of spatiotemporal dissipative solitons by the phase modulation of a broad beam, **J. Opt. Soc. Amer. B-Opt. Phys.**, 27, 1266, 2010	2010	J. Opt. Soc. Amer. B-Opt. Phys.	2,21208	1
166	E6 -A 40	DFT	H. Leblond, **D. Mihalache,** Ultrashort light bullets described by the two-dimensional sine-Gordon equation, **Phys. Rev. A**, 81, 063815, 2010	2010	PHYSICAL REVIEW A	3,08984	9
167	E6 -A 41	DFT	L. Wu, L. Li, J.F. Zhang, **D. Mihalache,** B.A. Malomed, W.M. Liu, Exact solutions of the Gross-Pitaevskii equation for stable vortex modes in two-dimensional Bose-Einstein condensates, **Phys. Rev. A**, 81, 061805, 2010	2010	PHYSICAL REVIEW A	3,08984	5
168	E6 -A 42	DFT	**D. Mihalache, D. Mazilu**, V. Skarka, B.A. Malomed, H. Leblond, N.B. Aleksic, F. Lederer, Stable topological modes in two-dimensional Ginzburg-Landau models with trapping potentials, **Phys. Rev. A**, 82, 023813, 2010	2010	PHYSICAL REVIEW A	3,08984	5
169	E6 -A 43	DFT	H. Leblond, **D. Mihalache,** Few-optical-cycle dissipative solitons, **J. Phys. A-Math. Theor.**, 43, 375205, 2010	2010	J PHYS A-MATH THEOR	1,54639	1
170	E6 -A 44	DFT	Y.J. He, **D. Mihalache,** B.B. Hu, Annular light beams induced by coupling a dissipative spatial soliton on the top of a sharp external potential, **J. Opt. Soc. Amer. B-Opt. Phys.**, 27, 2174, 2010	2010	J. Opt. Soc. Amer. B-Opt. Phys.	2,21208	0
171	E6 -A 45	DFT	V. Skarka, N.B. Aleksic, H. Leblond, B.A. Malomed, **D. Mihalache,** Varieties of stable vortical solitons in Ginzburg-Landau media with radially inhomogeneous losses, **Phys. Rev. Lett.**, 105, 213901, 2010	2010	PHYSICAL REVIEW LETTERS	7,98625	0
172	E6 -A 46	DFT	Q. Tian, L. Wu, J.F. Zhang, B.A. Malomed, **D. Mihalache,** W.M. Liu, Exact soliton solutions and their stability control in the nonlinear Schrodinger equation with spatiotemporally modulated nonlinearity, **Phys.**	2011	Phys. Rev. E,	1,41582	0
173	E6 -A 47	DFT	C.P. Yin, **D. Mihalache,** Y.J. He, Dynamics of two-dimensional dissipative spatial solitons interacting with an umbrella-shaped potential, **J. Opt. Soc. Amer. B-Opt. Phys.**, 28, 342, 2011	2011	J. Opt. Soc. Amer. B-Opt. Phys.	2,21208	0
174	E6 -A 48	DFT	F.W. Ye, **D. Mihalache,** B.B. Hu, N.C. Panoiu, Subwavelength vortical plasmonic lattice solitons, **Optics Lett.**, 36, 1179, 2011	2011	Optics Letter	3,50221	6
175	E6 -A 49	DFT	H. Leblond, H. Triki, F. Sanchez, **D. Mihalache,** Robust circularly polarized few-optical-cycle solitons in Kerr media, **Phys. Rev. A**, 83, 063802, 2011	2011	PHYSICAL REVIEW A	3,08984	7

176	E6 -A 50	DFT	H. Leblond, B.A. Malomed, **D. Mihalache,** Spatiotemporal vortex solitons in hexagonal arrays of waveguides, **Phys. Rev. A**, 83, 063825, 2011	2011	PHYSICAL REVIEW A	3,08984	4
177	E6 -A 51	DFT	H. Leblond, H. Triki, **D. Mihalache,** Circularly polarized few-optical-cycle solitons in the short-wave-approximation regime, **Phys. Rev. A**, 84, 023833, 2011	2011	PHYSICAL REVIEW A	3,08984	5
178	E6 -A 52	DFT	**Gh. Adam**, **S. Adam,** Rigorous derivation of the mean field Green functions of the two-band Hubbard model of superconductivity, **J. Phys. A: Math. Theor.**, 40, 11205, 2007	2007	J PHYS A-MATH THEOR	1,54639	1
179	E6 -A 53	DFT	**Gh. Adam**, **S. Adam**, Separation of the spin-charge correlations in the two-band Hubbard model of high-Tc superconductivity, **J. Optoel. Adv. Mat.**, 10, 1666, 2008	2008	J OPTOELECTRON ADV M	0,32990	0
180	E6 -A 54	DFT	**C. Grama**, **N. Grama**, I. Zamfirescu, Riemann surface approach to bound and resonant states. Application to a two channel model with square potential, **J. Phys. B: At. Mol. Phys.**, 40, 1035, 2007	2007	J. Phys. B	2,0200	0
181	E6 -A 55	DFT	**N. Grama**, **C. Grama**, I. Zamfirescu, A uniform asymptotic approximation of the 3D scattering wavefunction for a central potential: A new ansatz, **J. Phys. A: Math. Theor.**, 42, 465306, 2009	2009	J PHYS A-MATH THEOR	1,54639	7
182	E6 -A 56	DFT	**C. Grama**, **N. Grama**, I. Zamfirescu, Riemann surface approach to bound and resonant states for a nonlocal potential, **J. Math. Phys.**, 51, 122106, 2010	2010	J. Math. Phys.	0,83164	0
183	E6 -A 57	DFT	**A.I. Nicolin, M.C. Raportaru,** Faraday waves in high-density cigar-shaped Bose-Einstein condensates**, Physica A,** 389, 4663, 2010	2010	PHYSICA A	1,19588	0
184	E6 -A 58	DFT	**A.I. Nicolin**, Resonant wave formation in Bose-Einstein condensates, **Phys. Rev. E** (accepted for publication)	2011	Phys. Rev. E,	1,41582	0
185	E6 -A 59	DFT	**A. Isar**, W. Scheid, Quantum decoherence and classical correlations of the harmonic oscillator in the Lindblad theory, **Physica A,** 373, 298, 2007	2007	PHYSICA A	1,19588	5
186	E6 -A 60	DFT	**A. Isar**, Quantum decoherence of the damped harmonic oscillator, **Opt. Spectroscopy,** 103, 252, 2007	2007	Opt. Spectroscopy	0,41826	14
187	E6 -A 61	DFT	**A. Isar**, Decoherence and asymptotic entanglement in open quantum dynamics, **J. Russ. Laser Res.**, 28, 439, 2007	2007	J. Russ. Laser Res.	0,43299	1
188	E6 -A 62	DFT	**A. Isar**, Quantum fidelity for Gaussian states describing the evolution of open systems, **Eur. Phys. J.-Spec. Top.**, 160, 225, 2008	2008	Eur. Phys. J.-Spec. Top.,	1,00802	10
189	E6 -A 63	DFT	**A. Isar**, Asymptotic entanglement in open quantum systems, **Int. J. Quantum Inf.**, 6, 689, 2008	2008	Int. J. Quantum Inf.	0,5	0
190	E6 -A 64	DFT	**A. Isar**, Entanglement in open quantum dynamics, **Phys. Scripta**, T135, 014033, 2009	2009	Phys. Scripta	0,77205	2
191	E6 -A 65	DFT	**A. Isar**, Entanglement generation and evolution in open quantum systems, **Open Syst. Inf. Dynamics**, 16, 205, 2009	2009	Open Syst. Inf. Dynamics	1,05345	6
192	E6 -A 66	DFT	**A. Isar**, Entanglement dynamics of two-mode Gaussian states in a thermal environment, **J. Russ. Laser Res.**, 30, 458, 2009	2009	J. Russ. Laser Res.	0,43299	2
193	E6 -A 67	DFT	**A. Isar**, Time evolution of entanglement in open quantum systems, **J. Optoel. Adv. Mat.**, 12, 68, 2010	2010	J OPTOELECTRON ADV M	0,32990	3
194	E6 -A 68	DFT	**A. Isar**, Generation and evolution of entanglement in open quantum dynamics, **Opt. Spectroscopy**, 108, 213, 2010	2010	Opt. Spectroscopy	0,41826	7
195	E6 -A 69	DFT	**A. Isar,** Entanglement and mixedness in open systems with continuous variables, **J. Russ. Laser Res.**, 31, 182, 2010	2010	J. Russ. Laser Res.	0,43299	0
196	E6 -A 70	DFT	**A. Isar**, Dynamics of quantum entanglement in Gaussian open systems, **Phys. Scripta**, 82, 038116, 2010	2010	Phys. Scripta	0,77205	1
197	E6 -A 71	DFT	**A. Isar**, Continuous variable entanglement in open quantum dynamics, **Phys. Scripta**, T140, 014023, 2010	2010	Phys. Scripta	0,77205	5
198	E6 -A 72	DFT	**A. Isar**, Entanglement in two-mode continuous variable open quantum systems, **Phys. Scripta**, T143, 014012, 2011	2011	Phys. Scripta	0,77205	2
199	E6 -A 73	DFT	**A. Isar**, Quantum entanglement and quantum discord of two-mode Gaussian states in a thermal environment, **Open Syst. Inf. Dynamics**, 18, 175, 2011	2011	Open Syst. Inf. Dynamics	1,05345	2
200	E6 -A 74	DFT	**L. Gr. Ixaru**, Efficient computation of the Airy propagators, **Comput. Phys. Commun.**, 176, 637, 2007	2007	COMPUT PHYS COMMUN	2,17764	1
201	E6 -A 75	DFT	**L. Gr. Ixaru**, Fast LP method for the Schroedinger equation, **Comput. Phys. Commun.**, 177, 897, 2007	2007	COMPUT PHYS COMMUN	2,17764	9
202	E6 -A 76	DFT	**L. Gr. Ixaru**, Exactly solvable coupled-channel Schrodinger equation, **Phys. Rev. A**, 77, 064102, 2008	2008	PHYSICAL REVIEW A	3,08984	1
203	E6 -A 77	DFT	E. De Lauro, S. De Martino, M. Falanga, **L. Gr. Ixaru**, Limit cycles in nonlinear excitation of clusters of classical oscillators, **Comput. Phys. Commun.**, 180, 1832, 2009	2009	COMPUT PHYS COMMUN	2,17764	2
204	E6 -A 78	DFT	D. Conte, E. Esposito, B. Paternoster, **L. Gr. Ixaru**, Some new uses of the eta(m)(Z) functions, **Comput. Phys. Commun.**, 181, 128, 2010	2010	COMPUT PHYS COMMUN	2,17764	0
205	E6 -A 79	DFT	**V. Barsan**, Analytic results for a phase transition in a planar array of chains , **Philos. Mag.**, 87, 1043, 2007	2007	Philos. Mag.	4,21951	0
206	E6 -A 80	DFT	A. Cardone, **L. Gr. Ixaru**, B. Paternoster, Exponential fitting direct quadrature methods for Volterra integral equations, **Num. Algor.**, 55, 467, 2010	2010	NUMERICAL ALGORITHMS	0,84259	6
207	E6 -A 81	DFT	R. D'Ambrosio, **L. Gr. Ixaru**, B. Paternoster, Construction of the ef-based Runge-Kutta methods revisited, **Comput. Phys. Commun.**, 182, 322, 2011	2011	COMPUT PHYS COMMUN	2,17764	0
208	E6 -A 82	DFT	**V. Barsan**, **S. Cojocaru**, Physical applications of a simple approximation of Bessel functions of integer order, **Eur. J. Phys.**, 28, 983, 2007	2007	Eur. J. Phys.	0,64058	6
209	E6 -A 83	DFT	**V. Barsan,** Exact thermodynamics of a planar array of Ginzburg-Landau chains with nnn interaction, **J. Phys.: Condens. Matter**, 20, 019701, 2008	2008	J. Phys.: Condens. Matter	1,84325	3
210	E6 -A 84	DFT	**V. Barsan,** Phase transitions in low-dimensional psi^4 systems, **Philos. Mag.**, 88, 121, 2008	2008	Philos. Mag.	4,21951	0
211	E6 -A 85	DFT	**V. Barsan,** A two-parameter generalization of the complete elliptic integral of second kind, **The Ramanujan J.**, 20, 153, 2009	2009	The Ramanujan J	0,84681	0

212	E6 -A 86	DFT	**V. Barsan,** The quartic oscillator in an external field and the statistical physics of highly anisotropic solids, **Philos. Mag.,** 91, 477, 2011	2011	Philos. Mag.	4,21951	0
213	E7 -A 1	DFT	Y. Lei, S. Pittel, **N. Sandulescu**, A. Poves, B. Thakur, and Y. M. Zhao **Phys. Rev. C** 84, 044318 (2011) Systematic study of proton-neutron pairing correlations in the nuclear shell model	2011	Physical Review C	1,24767	3
214	E7 -A 2	DFT	M. Fortin, F. Grill, J. Margueron, Dany Page, and **N. Sandulescu** **Phys. Rev. C** 82, 065804 (2010) Thermalization time and specific heat of the neutron stars crust	2010	Physical Review C	1,24767	0
215	E7 -A 3	DFT	N. Pillet, **N. Sandulescu**, P. Schuck, and J.-F. Berger **Phys. Rev. C** 81, 034307 (2010) Two-particle spatial correlations in superfluid nuclei	2010	Physical Review C	1,24767	1
216	E7 -A 4	DFT	**N. Sandulescu**, B. Errea, and J. Dukelsky **Phys. Rev. C** 80, 044335 (2009) Isovector neutron-proton pairing with particle number projected BCS	2009	Physical Review C	1,24767	0
217	E7 -A 5	DFT	**N. Sandulescu** and G. F. Bertsch **Phys. Rev. C** 78, 064318 (2008) Accuracy of BCS-based approximations for pairing in small Fermi systems	2008	Physical Review C	1,24767	0
218	E7 -A 6	DFT	B. Thakur, S. Pittel, and **N. Sandulescu** **Phys. Rev. C** 78, 041303 (2008) Density matrix renormalization group study of 48Cr and 56Ni	2008	Physical Review C	1,24767	1
219	E7 -A 7	DFT	N. Pillet, **N. Sandulescu**, and P. Schuck **Phys. Rev. C** 76, 024310 (2007) Generic strong coupling behavior of Cooper pairs on the surface of superfluid nuclei	2007	Physical Review C	1,24767	0
220	E7 -A 8	DFT	Nuclear superfluidity and cooling time of neutron star crusts C. Monrozeau, J. Margueron, and N. **Sandulescu** **Phys. Rev. C** 75, 065807 (2007)	2007	Physical Review C	1,24767	0
221	E7 -A 9	DFT	F. Grill, J. Margueron, **N. Sandulescu**, **Phys. Rev. C,** accepted The structure of the inner crust of neutron stars in the HFB approximation,	2011	Physical Review C	1,24767	1
222	E7 -A 11	DFT	M. Grasso, S. Yoshida, **N. Sandulescu**, N. Van Giai **Nucl. Phys. A** 788 337-342 (2007) Giant halo and anti-halo in the non-relativistic mean field approach	2007	NUCLEAR PHYSICS A	1,09321	6
223	E7 -A 12	DFT	E. Khan, N. Van Giai, **N. Sandulescu Nucl. Phys. A** 789 94-102 (2007) Pairing interactions and vanishing pairing correlations in hot nuclei	2007	NUCLEAR PHYSICS A	1,09321	5
224	E7 -A 13	DFT	Plumari S, **Baran V,** Di Toro , Ferini G, Greco V **PHYSICS LETTERS B** Volume: 689 Issue: 1 Pages: 18-22 (2010) Does the NJL chiral phase transition affect the elliptic flow of a fluid at fixed eta/s?	2010	PHYSICS LETTERS B	3,62428	4
225	E7 -A 14	DFT	Colonna M, **Baran V,** Di Toro M, Rizzo J **NUCLEAR PHYSICS A** Volume: 834 Issue: 1-4 Pages: 527C-530C (2010) Dynamical Phase Trajectories in Baryon and Isospin Density Spaces	2010	NUCLEAR PHYSICS A	1,09321	16
226	E7 -A 15	DFT	Corsi A, Wieland O, Kravchuk VL, Bracco A, Camera F, Benzoni G, Blasi N (Blasi, N.)2, Brambilla S, Crespi FCL, Giussani A, Leoni S, Million B, Montanari D, Moroni A, Gramegna F, Lanchais A, Mastinu P, Brekiesz M, Kmiecik M, Maj A, Bruno M, D'Agostino M, Geraci E, Vannini G, Barlini S, Casini G, Chiari M, Nannini A, Ordine A, Di Toro M, Rizzo C, Colonna M, **Baran V** **PHYSICS LETTERS B** 679 (2009) 197-202 Excitation of the dynamical dipole in the charge asymmetric reaction O-16+Sn-116	2009	PHYSICS LETTERS B	3,62428	1
227	E7 -A 16	DFT	Di Toro M, **Baran V**, Colonna M, Ferini G, Gaitanos T, Giordano V, Greco V, Bo L, Zielinska-Pfabe M, Plumari S, Prassa V, Rizzo C, Rizzo J, Wolter HH **PROGRESS IN PARTICLE AND NUCLEAR PHYSICS** (2009) 62 Issue: 2 (389-401) Isospin dynamics in heavy ion collisions: From Coulomb barrier to quark gluon plasma	2009	Prog.Part.Nucl.Phys.	2,59787	5
228	E7 -A 17	DFT	I. Skwira-Chalot, K. Siwek-WilczyÅ„ska, J. WilczyÅ„ski, F. Amorini, A. Anzalone, L. Auditore, **V. Baran**, J. Brzychczyk, G. Cardella, S. Cavallaro, M. B. Chatterjee, M. Colonna, E. De Filippo, M. Di Toro, W. Gawlikowicz, E. Geraci, A. Grzeszczuk, P. Guazzoni, S. Kowalski, E. La Guidara, G. Lanzalone, G. LanzanÃ², J. Lukasik, C. Maiolino, Z. Majka, N. G. Nicolis, A. Pagano, E. Piasecki, S. Pirrone, R. Paneta, G. Politi, F. Porto, F. Rizzo,P. Russotto, K. Schmidt, A. Sochocka, Åšwiderski, A. TrifirÃ², M. Trimarchi, J. P. Wieleczko,L. Zetta,W. Zipper **Phys. Rev. Lett.** 101, 262701 (Dec 2008) Fast Ternary and Quaternary Breakup of the 197Au+197Au System in Collisions at 15 MeV/nucleon	2008	PHYSICAL REVIEW LETTERS	7,98625	0
229	E7 -A 18	DFT	Rizzo J, Colonna M, **Baran V**, Toro M Di, Wolter HH, Zielinska-Pfabe M **NUCLEAR PHYSICS A** Volume: 806 Pages: 79-104 (JUN 2008) Isospin dynamics in peripheral heavy ion collisions at Fermi energies	2008	NUCLEAR PHYSICS A	1,09321	2
230	E7 -A 19	DFT	Martin B, Pierroutsakou D, Agodi C, Alba R, **Baran V**, Boiano A, Cardella G, Colonna M, Coniglione R, De Filippo E, Del Zoppo A, Di Toro M, Inglima G, Glodariu T, La Commar M, Maiolino C, Mazzocco M, Pagano A, Piattelli P, Pirrone S, Rizzo C, Rornoli M, Sandoli M, Santonocito D, Sapienza P, Signorini C **PHYSICS LETTERS B** Volume: 664 Issue: 1-2 Pages: 47-51 (JUN 2008) Prompt dipole radiation in fusion reactions	2008	PHYSICS LETTERS B	3,62428	0
231	E7 -A 20	DFT	Di Toro M, **Baran V**, Colonna M, Ferini G, Gaitanos T,Greco V, Rizzo J , Wolter HH **Nuclear Physics A** 787: 585C-594C (May 2007) Isospin dynamics in heavy ion collisions: EoS-sensitive observables	2007	NUCLEAR PHYSICS A	1,09321	17
232	E7 -A 21	DFT	Wilczynski J, Skwira-Chalot I, Siwek-Wilczynska K, ... **Baran V**....et al **PHYSICAL REVIEW C** Volume: 81 Issue: 6 Article Number: 067604 (2010) Aligned breakup of heavy nuclear systems as a new type of deep inelastic collisions at small impact parameters	2010	Physical Review C	1,24767	2
233	E7 -A 22	DFT	Wilczynski J, Skwira-Chalot I, Siwek-Wilczynska K, ... **Baran V**....et al. **PHYSICAL REVIEW C** Volume: 81 Issue: 2 Article Number: 024605 (2010) Observation of fast collinear partitioning of the Au-197+Au-197 system into three and four fragments of comparable size	2010	Physical Review C	1,24767	0
234	E7 -A 23	DFT	Russotto P, De Filippo E, Pagano A, ... **Baran V.** ...et al **PHYSICAL REVIEW C** Volume: 81 Issue: 6 Article Number: 064605 (2010) Strong enhancement of dynamical emission of heavy fragments in the neutron-rich Sn-124+Ni-64 reaction at 35A MeV	2010	Physical Review C	1,24767	0
235	E7 -A 24	DFT	M. Di Toro, B. Liu, V. Greco, **V. Baran**, M. Colonna, and S. Plumari **Phys. Rev. C** 83, 014911 (2011) Symmetry energy effects on the mixed hadron-quark phase at high baryon density	2011	Physical Review C	1,24767	0
236	E7 -A 25	DFT	C. Rizzo, **V. Baran**, M. Colonna, A. Corsi, and M. Di Toro **Phys. Rev. C** 83, 014604 (2011) Symmetry energy effects on fusion cross sections	2011	Physical Review C	1,24767	11
237	E7 -A 26	DFT	M. Di Toro, **V. Baran**, M. Colonna, V.Greco, **JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS** , 37 Issue: 8 083101 (2010) Probing the nuclear symmetry energy with heavy-ion collisions	2010	J PHYS G NUCL PARTIC	1,00000	0
238	E7 -A 27	DFT	Di Toro M, Colonna M, Rizzo C and **V. Baran** **INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS** 17 , 1 , 110-119 (2008) The dynamical dipole radiation in dissipative collisions with exotic beams	2008	International Journal of Modern Physics E	0,26099	3

239	E7 -A 28	DFT	Wilczynski J, Skwira-Chalot I, Siwek-Wilczynska K, .. **V. Baran**,.. **INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS** 17 Issue: 1 41-52 (2008) Re-separation modes of Au-197+Au-197 system at sub-Fermi energies	2008	International Journal of Modern Physics E	0,26099	0
240	E7 -A 29	DFT	Planeta R, Amorini F, Anzalone A, Auditore L, **Baran V.** et al **PHYSICAL REVIEW C** Volume: 77 Issue: 1 Article Number: 014610 (2008) Centrality dependence of isospin effect signatures in Sn-124+Ni-64 and Sn-112+Ni-58 reactions	2008	Physical Review C	1,24767	1
241	E7 -A 30	DFT	Di Toro M, Colonna M, Greco V, ...**Baran V**... Source: **INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS** Volume: 17 Issue: 9 Pages: 1799-1814 Published: OCT 2008 CONSTRAINING THE SYMMETRY ENERGY: A JOURNEY IN THE ISOSPIN PHYSICS FROM COULOMB BARRIER TO DECONFINEMENT	2008	International Journal of Modern Physics E	0,26099	3
242	E7 -A 31	DFT	De Filippo E, Amorini F, Anzalone A, **Baran V.** et al. **ACTA PHYSICA POLONICA B** 40 4 1199-1207 (2009) DYNAMICAL SIGNALS IN FRAGMENTATION REACTIONS: TIME SCALE	2009	ACTA PHYS POL B	0,55670	0
243	E7 -A 32	DFT	Di Toro M, Colonna M, Ferini G, ... **Baran V** al. INTERNATIONAL JOURNAL OF MODERN PHYSICS E-NUCLEAR PHYSICS 19 Issue: 5-6 856-868 (2010) PROBING THE NUCLEAR MATTER AT HIGH BARYON AND ISOSPIN DENSITY WITH HEAVY ION COLLISIONS	2010	International Journal of Modern Physics E	0,26099	0
244	E7 -A 33	DFT	Pierroutsakou D, Martin B, Agodi C,.. **Baran V.** et al. **PHYSICAL REVIEW C** 80 Issue: 2 Article 024612 (2009) Dynamical dipole mode in fusion reactions at 16 MeV/nucleon and beam energy dependence	2009	Physical Review C	1,24767	0
245	E7 -A 34	DFT	Papa M, Amorini F, Anzalone A, .. **V. Baran** et al . **PHYSICAL REVIEW C** 75 (5) 054616 (2007) Dynamical multi-breakup processes in the Sn-124+Ni-64 system at 35 MeV/nucleon	2007	Physical Review C	1,24767	0
246	E7 -A 35	DFT	Skwira-Chalot I, Siwek-Wilczynska K, Wilczynski J, … **V.Baran**… . (CHIMERA INT. COLL.) **ACTA PHYSICA POLONICA B** 38 I 1509-1514 (2007) Dynamics of "binary" Au-197+(197) Au collisions as a test of energy dissipation mechanism	2007	ACTA PHYS POL B	0,55670	0
247	E7 -A 36	DFT	Skwira-Chalot I, Siwek-Wilczyinska K, Wilczynski J, ... **V.Baran**...(CHIMERA INT. COLL.) **INT. JOUR. OF MODERN PHYSICS E** 16 511-515 (2007) Ternary reactions in Au-197+Au-197 collisions revisited	2007	International Journal of Modern Physics E	0,26099	0
248	E7 -A 37	DFT	**V. Baran**, C. Rizzo, M. Colonna, M. Di Toro, and D. Pierroutsakou **Phys. Rev. C** 79, 021603 (2009) Dynamical dipole mode in fusion reactions with exotic nuclear beams	2009	Physical Review C	1,24767	0
249	E7 -A 38	DFT	M. Colonna, **V. Baran**, M. Di Toro, and H. H. Wolter **Phys. Rev. C** 78, 064618 (2008) Isospin distillation with radial flow: A test of the nuclear symmetry energy	2008	Physical Review C	1,24767	0
250	E7 -A 39	DFT	F. Grill, J. Margueron, **N. Sandulescu**, Cluster structure of the inner crust of neutron stars in the Hartree-Fock-Bogoliubov approach, Physical Review C Vol 84, Art No 065801 (2011)	2011	Physical Review C	1,24767	0
251	E8 -A 1	DFT	B. Ananthanarayan, **I. Caprini**, I.S. Imsong, Implications of the recent high statistics determination of the pion electromagnetic form factor in the timelike region, Phys Rev D 83, 096002, 2011	2011	Phys Rev D	1,67198	0
252	E8 -A 2	DFT	**I. Caprini,** J. Fischer, I. Vrkoc, On the ambiguity of functions represented by divergent power series, **APPLIED NUMERICAL MATHEMATICS**, 60, 1264, 2010	2010	APPLIED NUMERICAL MATHEMATICS	1,121	0
253	E8 -A 3	DFT	C. Bourrely, L. Lellouch, I. **Caprini,** Model-independent description of B -> pi lv decays and a determination of vertical bar V(ub)vertical bar (vol 79, 013008, 2009), **Phys Rev D** 82, 099902, 2010	2010	Phys Rev D	1,67198	2
254	E8 -A 4	DFT	G. Abbas, B. Ananthanarayan, **I. Caprini**, I.S. Imsong, Improving the phenomenology of Kl3 form factors with analyticity and unitarity, Phys Rev D 82, 094018, 2010	2010	Phys Rev D	1,67198	9
255	E8 -A 5	DFT	G. Abbas, B. Ananthanarayan, **I. Caprini**, I.S. Imsong, S. Ramanan, Theory of unitarity bounds and low-energy form factors, EUROPEAN PHYSICAL JOURNAL A, 45, 389, 2010	2010	European Physical Journal A	1,10519	2
256	E8 -A 6	DFT	G. Abbas, B. Ananthanarayan, **I. Caprini**, I.S. Imsong, S. Ramanan, Stringent constraints on the scalar K pi form factor from analyticity, unitarity and low-energy theorems, EUROPEAN PHYSICAL JOURNAL A 44, 175, 2010	2010	European Physical Journal A	1,10519	5
257	E8 -A 7	DFT	**Caprini, I**; Fischer, J, alpha (s) from tau decays: contour-improved versus fixed-order summation in a new QCD perturbation expansion, **EUROPEAN PHYSICAL JOURNAL C** vol 64, pp 35, 2009	2009	European Physical Journal C	1,30361	1
258	E8 -A 8	DFT	**I. Caprini,** J. Fischer, I. Vrkoc, On the ambiguity of field correlators represented by asymptotic perturbation expansions, JOURNAL OF PHYSICS A-MATHEMATICAL AND THEORETICAL, 42, 395403, 2009	2009	J PHYS A-MATH THEOR	1,54639	1
259	E8 -A 9	DFT	C. Bourrely, L. Lellouch, **I. Caprini,** Model-independent description of B -> pi l nu decays and a determination of vertical bar V(ub)vertical bar, **Phys Rev D** 79 013008, 2009	2009	Phys Rev D	1,67198	0
260	E8 -A 10	DFT	**I. Caprini,** Finding the sigma pole by analytic extrapolation of pi pi scattering data, **Phys Rev D** 77 114019, 2008	2008	Phys Rev D	1,67198	11
261	E8 -A 11	DFT	**I. Caprini,** J. Fischer, Comment on "Infrared freezing of Euclidean QCD observables", **Phys Rev D** 76 018501, 2007	2007	Phys Rev D	1,67198	0
262	E8 -A 12	DFT	**I. Caprini**, J. Fischer. **Phys.Rev. D**84 (2011) 054019	2011	Phys Rev D	1,67198	0
263	E8 -A 13	DFT	**S.Berceanu, A Gheorghe**, On the geometry of Siegel Jacobi domains, **Int. J. Geom. Methods Mod. Phys.** 8, N8, 2011	2011	Int. J. Geom. Methods Mod. Phys.	0,62610	3
264	E8 -A 15	DFT	**A.C. Gheorghe, A. A. Raduta**, A. Faessler, 34. Solvable models for the gamma deformation having X(5) as limiting symmetry, **Phys. Lett. B** 648, 171, 2007	2007	PHYSICS LETTERS B	3,62428	0
265	E8 -A 16	DFT	**P. Dita**, Hadamard matrices from mutually unbiased bases,**J.Math.Phys.** 51, 072202-1, 2010	2010	J. Math. Phys.	0,83164	0
266	E8 -A 17	DFT	**A. A. Raduta, Al. H. Raduta and R. Budaca**, Collective properties of Na clusters, Journal of Superconductivity and Novel Magnetism**, 24 (2011) 645-651.**	2011	Journal of Superconductivity and Novel Magnetism,	0,66	30
267	E8 -A 17	DFT	**P. Dita**, Complex Hadamard matrices from Sylvester inverse orthogonal matrices, **Open Sys. & Inform.Dyn**. 16, 387,2010	2010	Open Syst. Inf. Dynamics	1,05345	1
268	E8 -A 18	DFT	**D. R. Grigore**, Quantum Strings and Superstrings, **Reviews in Mathematical Physics** 19, 749, 2007	2007	Reviews in Mathematical Physics	1,258	0
269	E8 -A 19	DFT	**D. R. Grigore**, G. Scharf, No-Go Result for Supersymmetric GaugeTheories in the Causal Approach, **Annalen der Physik (Berlin)** 17, 864, 2008	2008	Annalen der Physik – Berlin	1,27835	0

270	E8 -A 20	DFT	**D. R. Grigore**, G. Scharf, Massive Gravity from Descent Equations, **Classical and Quantum Gravity** 25, 225008, 2008	2008	Classical and Quantum Gravity	2,18099	1
271	E8 -A 21	DFT	**D. R. Grigore**, Perturbative Gravity in the Causal Approach, **Classical Quant. Gravity** 27, 015013, 2010	2010	Classical and Quantum Gravity	2,18099	17
272	E8 -A 22	DFT	**D. R. Grigore**, The Interaction of Quantum Gravity with Matter, **Classical Quant. Gravity** 27, 225004, 2010	2010	Classical and Quantum Gravity	2,18099	0
273	E8 -A 23	DFT	**D. R. Grigore**, G. Scharf, From Massive Gravity to Modifies General Relativity II, **General Relativity and Gravitation** 43, 1323, 2011	2011	General Relativity and Gravitation	1,69759	0
274	E8 -A 24	DFT	R. Gurau, A. Malbouisson, V. Rivasseau, **A. Tanasa**, Non-commutative complete Mellin representation for Feynman amplitudes, Lett. Math. Phys. 81, 161, 2007	2007	Lett. Math. Phys.	0,83976	34
275	E8 -A 25	DFT	C. Bizdadea, E. M. Cioroianu, S. O. Saliu, **E. M. Babalic,** Dual linearized gravity in D=6 coupled to a purely spin-two field of mixed symmetry (2,2), **Fortschr. Phys.** 58, 341, 2010	2010	Fortschr. Phys.	0,99198	20
276	E8 -A 26	DFT	C. Bizdadea, E. M. Cioroianu, S. O. Saliu, **E. M. Babalic,** Yes-go cross-couplings in collections of tensor fields with mixed symmetries of the type (3,1) and (2,2), Int. J. Mod. Phys. A25 1211, 2010	2010	International Journal of Modern Physics A	0,39148	2
277	E8 -A 27	DFT	E. Dudas, G. von Gersdorff, **D.M. Ghilencea**, S. Lavignac, J. Parmentier, On non-universal Goldstino couplings to matter, accepted for publication in **Nuclear Physics B**	2011	NUCLEAR PHYSICS B	1,89759	5
278	E8 -A 28	DFT	S. Cassel, **D.M. Ghilencea**, S. Kraml, A. Lessa, G.G. Ross, Fine-tuning implications for complementary dark matter and LHC SUSY searches, **JHEP** 1105, 120, 2011	2011	J HIGH ENERGY PHYS	1,67711	12
279	E8 -A 29	DFT	I. Antoniadis, E. Dudas, **D. M. Ghilencea**, P. Tziveloglou, Beyond the MSSM Higgs with d=6 effective operators, **Nucl.Phys. B**848, 1, 2011	2011	NUCLEAR PHYSICS B	1,89759	5
280	E8 -A 30	DFT	I. Antoniadis, E. Dudas, **D. M. Ghilencea**, P. Tziveloglou, Non-linear MSSM, Nuclear Physics B 841, 157, 2010	2010	NUCLEAR PHYSICS B	1,89759	0
281	E8 -A 31	DFT	S. Cassel, **D. M. Ghilencea**, Graham G. Ross, Testing SUSY at the LHC: Electroweak and Dark matter fine tuning at two-loop order, **Nuclear Physics B** 835, 110, 2010	2010	NUCLEAR PHYSICS B	1,89759	1
282	E8 -A 32	DFT	S. Cassel, **D. M. Ghilencea**, Graham G. Ross, Testing SUSY, **Physics Letters B** 687, 214, 2010	2010	PHYSICS LETTERS B	3,62428	0
283	E8 -A 33	DFT	I. Antoniadis, E. Dudas, **D. M. Ghilencea,** P. Tziveloglou, MSSM Higgs with dimension-six operators, **Nuclear Physics B** 831, 133, 2010	2010	NUCLEAR PHYSICS B	1,89759	22
284	E8 -A 34	DFT	C. Angelantonj, **C. Condeescu**, E. Dudas, M. Lennek, Stringy Instanton Effects in Models with Rigid Magnetised D-branes, **Nucl. Phys. B** 818, 52, 2009	2009	NUCLEAR PHYSICS B	1,89759	0
285	E8 -A 35	DFT	P.G. Camara, **C. Condeescu,** M. Lennek, Holomorphic variables in magnetized brane models with continuous Wilson lines, **JHEP**, 1004, 029, 2010	2010	J HIGH ENERGY PHYS	1,67711	2
286	E8 -A 36	DFT	P.G. Camara, **C. Condeescu,** E. Dudas, M. Lennek, Non-perturbative Vacuum Destabilization and D-brane Dynamics, **JHEP**, 1006, 062, 2010	2010	J HIGH ENERGY PHYS	1,67711	4
287	E8 -A 37	DFT	C. Angelantonj, **C. Condeescu,** E. Dudas, G. Pradisi, Non-perturbative transitions among intersecting-brane vacua, **JHEP**, 1107, 123, 2011	2011	J HIGH ENERGY PHYS	1,67711	40
288	E8 -A 38	DFT	**C.S. Acatrinei,** Noncommutative radial waves, **J. Phys.A** 41, 215401, 2008	2008	J PHYS A-MATH THEOR	1,54639	2
289	E8 -A 39	DFT	**C.S. Acatrinei**, A Path integral leading to higher-order Lagrangians, **J. Phys. A** 40, F929, 2007	2007	J PHYS A-MATH THEOR	1,54639	0
290	E8 -A 40	DFT	**C.S. Acatrinei**, Dimensional Reduction for Generalized Poisson Brackets, **J. Math. Phys**. 49, 022903, 2008	2008	J. Math. Phys.	0,83164	0
291	E8 -A 41	DFT	**A. Micu,** Heterotic type IIA duality with fluxes - towards the complete story, JHEP 1010, 059, 2010	2010	J HIGH ENERGY PHYS	1,67711	6
292	E8 -A 42	DFT	**A. Micu,** Moduli stabilisation in heterotic models with standard embedding, JHEP 1001, 011, 2010	2010	J HIGH ENERGY PHYS	1,67711	0
293	E8 -A 43	DFT	J. Louis, D. Martinez-Pedrera, A. Micu, Heterotic compactifications on SU(2)-structure backgrounds, JHEP 0909, 012, 2009	2009	J HIGH ENERGY PHYS	1,67711	12
294	E8 -A 44	DFT	**A. Micu, A note on moduli stabilisation in heterotic models in the presence of matter fields, PHYS LETT B 674, 139, 2009**	2009	PHYSICS LETTERS B	3,62428	0
295	E8 -A 45	DFT	O. Aharony, M. Berkooz, J. Louis, **A. Micu**, Non-Abelian structures in compactifications of M-theory on seven-manifolds with SU(3) structure, JHEP 0809, 108, 2008	2008	J HIGH ENERGY PHYS	1,67711	4
296	E8 -A 46	DFT	S. Gurrieri, A. Lukas, **A. Micu**, Heterotic string compactifications on half-flat manifolds II, JHEP 0712, 081, 2007	2007	J HIGH ENERGY PHYS	1,67711	2
297	E8 -A 47	DFT	J. Louis, **A. Micu**, Heterotic-type IIA duality with fluxes, JHEP 0703, 026, 2007	2007	J HIGH ENERGY PHYS	1,67711	6
298	E8 -A 48	DFT	**A. Micu,** E. Palti, G. Tasinato, Towards Minkowski vacua in type II string compactifications, JHEP 0703, 104, 2007	2007	J HIGH ENERGY PHYS	1,67711	3
299	E8 -A 49	DFT	M. Goze M. Rausch de Traubenberg **A. Tanasa** Poincare and sl(2) algebras of order 3 **J. Math Phys.** 48, 093507, 2007	2007	J. Math. Phys.	0,83164	0
300	E8 -A 50	DFT	**A. Tanasa;** F. Vignes-Tourneret, Hopf algebra of non-commutative field theory, **Journal of Noncommutative Geometry,** 2, 125, 2008	2008	Journal of Noncommutative Geometry	2,08179	2
301	E8 -A 51	DFT	A. de Goursac, **A. Tanasa**, J.C. Wallet, Vacuum configurations for renormalizable non-commutative scalar models, **EUROPEAN PHYSICAL JOURNAL C** 53, 459, 2008	2008	European Physical Journal C	1,30361	3
302	E8 -A 52	DFT	V. Rivasseau, **A. Tanasa**, Parametric representation of "Covariant" noncommutative QFT models, **COMMUNICATIONS IN MATHEMATICAL PHYSICS** 279, 355, 2008	2008	COMMUNICATIONS IN MATHEMATICAL PHYSICS	2,31237	0
303	E8 -A 53	DFT	R. Gurau **A. Tanasa**, Dimensional regularization and renormalization of non-commutative quantum field theory, **ANNALES HENRI POINCARE** 9, 655, 2008	2008	ANNALES HENRI POINCARE	1,951	0
304	E8 -A 54	DFT	J. Ben Geloun, A. Tanasa, One-Loop beta Functions of a Translation-Invariant Renormalizable Noncommutative Scalar Model, **Lett. Math. Phys.** 86, 19, 2008	2008	Lett. Math. Phys.	0,83976	21
305	E8 -A 55	DFT	R. Gurau, J. Magnen, V. Rivasseau, **A. Tanasa,** A Translation-Invariant Renormalizable Non-Commutative Scalar Model, **Lett. Math. Phys.** 287, 275, 2009	2009	Lett. Math. Phys.	0,83976	4
306	E8 -A 56	DFT	J. Magnen, V. Rivasseau, **A.Tanasa**, Commutative limit of a renormalizable noncommutative model, **Europhysics Letters**, 86, 11001, 2009	2009	EPL – Europhys Lett	2,99656	1
307	E8 -A 57	DFT	**A. Tanasa,** Parametric representation of a translation-invariant renormalizable noncommutative model, **JOURNAL OF PHYSICS A-MATHEMATICAL AND THEORETICAL**, 42 Issue: 36 Article Number: 365208	2009	J PHYS A-MATH THEOR	1,54639	2
308	E8 -A 58	DFT	T. Krajewski, V. Rivasseau, **A. Tanasa**, Z. Wang, Topological graph polynomials and quantum field theory Part I: heat kernel theories, **Journal of Noncommutative Geometry** 4, 29, 2010	2010	Journal of Noncommutative Geometry	2,08179	2

309	E8 -A 59	DFT	**A. Tanasa,** Translation-Invariant Noncommutative Renormalization, SYMMETRY INTEGRABILITY AND GEOMETRY-METHODS AND APPLICATIONS 6, 047, 2010	2010	SYMMETRY INTEGRABILITY AND GEOMETRY-METHODS AND APPLICATIONS	0,64097	1
310	E8 -A 60	DFT	**A. Tanasa,** P. Vitale, Curing the UV/IR mixing for field theories with translation-invariant star products, **Phys. Rev. D** 81 065008, 2010	2010	PHYSICAL REVIEW D	1,67198	1
311	E8 -A 61	DFT	**A. Tanasa,** Algebraic structures in quantum gravity, **CLASSICAL AND QUANTUM GRAVITY**, 27, 095008, 2010	2010	Classical and Quantum Gravity	2,18099	1
312	E8 -A 62	DFT	T. Krajewski, J. Magnen, V. Rivasseau, **A. Tanasa**, P. Vitale, Quantum corrections in the group field theory formulation of the Engle-Pereira-Rovelli-Livine and Freidel-Krasnov models, **PHYSICAL REVIEW D** 82, 124069, 2010	2010	Phys Rev D	1,67198	7
313	E8 -A 63	DFT	**A. Tanasa,** Generalization of the Bollobas-Riordan polynomial for tensor graphs, **J. Math Phys** 52, 073514, 2011	2011	J. Math. Phys.	0,83164	0
314	E9 -A 1	DFT	A. Banu, **L. Trache**, **F. Carstoiu** et al., Structure of (23)Al from the one-proton breakup reaction and astrophysical implications, **Physical Review C**, 84, 015803, 2011.	2011	Physical Review C	1,24767	3
315	E9 -A 2	DFT	**S. Misicu**, and **F. Carstoiu,** Consistent description of hindrance in sub-barrier fusion of (48)Ca with (36)S, (48)Ca, and (96)Zr, **Physical Review C**, 83, 054622, 2011.	2011	Physical Review C	1,24767	0
316	E9 -A 3	DFT	**F. Carstoiu**, **S. Misicu**, **M. Rizea** et al., Bare alpha-alpha potential and implications on alpha-matter properties, **International Journal of Modern Physics E-Nuclear Physics**, 20, 885-888, 2011.	2011	International Journal of Modern Physics E	0,26099	9
317	E9 -A 4	DFT	**M. Rizea**, and **N. Carjan**, Computational study of scission neutrons in low-energy fission: Stationary and time-dependent approaches, **Communications Computational Physics**, 9, 917-936, 2011.	2011	Communications Computational Physics	1,21839	0
318	E9 -A 5	DFT	**S. Misicu**, and **F. Carstoiu**, Deep sub-barrier fusion reactions of the light nuclei (12)C and (16)O, **Nuclear Physics A**, 834, 180C-182C, 2010.	2010	NUCLEAR PHYSICS A	1,09321	3
319	E9 -A 6	DFT	T. Al-Abdullah, **F. Carstoiu**, X. Chen et al., …, **L. Trache**, Stellar reaction rate for (22)Mg + p -> (23)Al from the asymptotic normalization coefficient in the mirror nuclear system (22)Ne + n -> normalization coefficient in the mirror nuclear system (22)Ne + n -> (23)Ne, **Physical Review C**, 81,	2010	Physical Review C	1,24767	0
320	E9 -A 7	DFT	**N. Carjan**, and **M. Rizea**, Scission neutrons and other scission properties as function of mass asymmetry in (235)U(n(th),f), **Physical Review C** 82 (2010) 014617.	2010	Physical Review C	1,24767	11
321	E9 -A 8	DFT	**M. Rizea**, Exponential fitting method for the time-dependent Schrodinger equation, **Journal of Mathematical Chemistry**, 48, 55-65, 2010.	2010	Journal of Mathematical Chemistry	1,21408	4
322	E9 -A 9	DFT	**F. Carstoiu**, and **S. Misicu**, Saturation and condensate fraction reduction of cold alpha matter, **Physics Letters B**, 682, 33-39, 2009	2009	PHYSICS LETTERS B	3,62428	0
323	E9 -A 19	DFT	HI. Park, JC. Hardy, VE. Iacob, A. Banu, L. Chen, VV. Golovko, J. Goodwin, V. Horvat, N. Nica, E. Simmons, **L. Trache**, and R. E. Tribble, Precise half-life measurement of the superallowed β+ emitter 38Ca, Physical Review C Vol 84, Art No 065502 (2011)	2011	Physical Review C	1,24767	0
324	E9 -A 20	DFT	**Şerban Mişicu· Florin Carstoiu**, Absence of a maximum in the S factor at deep sub-barrier energies in the fusion reaction 40Ca + 40Ca, Physical Review C Vol 84, Art No 051601®, 2011	2011	Physical Review C	1,24767	0
325	E9 -A 10	DFT	A. Banu, T. Al-Abdullah, C. Fu, …, **L. Trache**, …, **F. Carstoiu** et al., Astrophysical S factor for the radiative capture (12)N(p,gamma)(13)O determined from the (14)N((12)N,(13)O)(13)C proton transfer	2009	Physical Review C	1,24767	4
326	E9 -A 11	DFT	V. Ledoux, **M. Rizea**, M. Van Daele, ..., and **I. Silisteanu**, Eigenvalue problem for a coupled channel Schrodinger equation with application to the description of deformed nuclear systems, **Journal of Computational and Applied Mathematics**, 228, 197-211, 2009.	2009	Journal of Computational and Applied Mathematics	0,88	0
327	E9 -A 12	DFT	J. -L. Lecouey, N. A. Orr, F. M. Marques, …, **F. Carstoiu** et al., Single-proton removal reaction study of (16)B, **Physics Letters B**, 672, 6-11, 2009.	2009	PHYSICS LETTERS B	3,62428	4
328	E9 -A 13	DFT	**M. Rizea**, V. Ledoux, M. Van Daele, ..., and **N. Carjan**, Finite difference approach for the two-dimensional Schrodinger equation with application to scission-neutron emission, **Computer Physics Communications**, 179, 466-478, 2008.	2008	COMPUT PHYS COMMUN	2,17764	0
329	E9 -A 14	DFT	C. L. Jiang, B. B. Black, H. Esbensen, …, **S. Misicu** et al., Fusion hindrance for a positive Q-value system, **Physical Review C**, 78, 017601, 2008.	2008	Physical Review C	1,24767	0
330	E9 -A 15	DFT	S. I. Bastrukov, I. V. Molodtsova, D. V. Podgainy, **S. Misicu** et al., Elasticity of nuclear medium as a principal macrodynamical promoter of electric pygmy dipole resonance, **Physics Letters B**, 664, 258-264, 2008.	2008	PHYSICS LETTERS B	3,62428	0
331	E9 -A 16	DFT	H. Esbensen, and **S. Misicu**, Hindrance of (16)O+(208)Pb fusion at extreme sub-barrier energies, **Physical Review C**, 76, 054609, 2007.	2007	Physical Review C	1,24767	0
332	E9 -A 17	DFT	S. I. Bastrukov, H. K. Chang, **S. Misicu**, et al., Spheroidal and torsional modes of quasistatic shear oscillations in the models of nuclear physics and pulsar astrophysics, **International Journal of Modern Physics A**,	2007	International Journal of Modern Physics A	0,39148	6
333	E9 -A 18	DFT	**S. Misicu**, and H. Esbensen, Signature of shallow potentials in deep sub-barrier fusion reactions, **Physical Review C**, 75, 034606, 2007.	2007	Physical Review C	1,24767	0
334	E10 -A 1	DFT	**S. Cojocaru**, R. Citro and M. Marinaro, Incoherent midinfrared charge excitation and the high-energy anomaly in the photoemission spectra of cuprates, **Phys. Rev. B** 75, 220502(R) (2007)	2007	PHYSICAL REVIEW B	2,62323	4
335	E10 -A 2	DFT	**S. Cojocaru**, R. Citro and M. Marinaro, Bond-stretching phonon anomalies and charge fluctuations in copper oxide superconductors, **Phys. Rev. B** 75, 014516 (2007)	2007	PHYSICAL REVIEW B	2,62323	0
336	E10 -A 3	DFT	**S. Cojocaru,** Green functions on finite lattices and their connection to the infinite lattice limit, **Phil. Mag.**, 88, 441 (2008)	2008	Philos. Mag.	4,21951	0

337	E10 -A 4	DFT	**S. Cojocaru**, Deviation from the Bloch law in a nanoscale Heisenberg ferromagnet, **Phil. Mag**., 91, 4053 (2011)	2011	Philos. Mag.	4,21951	0
338	E10 -A 5	DFT	**Dragos-Victor Anghel,** An ansatz for the exclusion statistics parameters in macroscopic physical systems described by fractional exclusion statistics, **Europhys. Lett.,** 90, 10006 (2010)	2010	EPL – Europhys Lett	2,99656	2
339	E10 -A 6	DFT	**Dragos-Victor Anghel**, Comment on "Statistical Distribution for Generalized Ideal Gas of Fractional-Statistics Particles", **Phys. Rev. Lett.** 104, 198901 (2010)	2010	PHYSICAL REVIEW LETTERS	7,98625	0
340	E10 -A 7	DFT	**G. A. Nemnes and Dragos-Victor Anghel**, Stochastic simulations for the time evolution of systems which obey generalized statistics: fractional exclusion statistics and Gentile's statistics, **J. Stat. Mech.** 09011 (2010)	2010	J. Stat. Mech.	2,15779	0
341	E10 -A 8	DFT	**D. V. Anghel,** Universality of heat and entropy transport in 1D channels at arbitrary temperatures, **Europhys. Lett.** 94, 60004 (2011)	2011	EPL – Europhys Lett	2,99656	9
342	E10 -A 9	DFT	**Dragos-Victor Anghel,** The fractional exclusion statistics amended, **Europhys. Lett.** 87, 60009 (2009)	2009	EPL – Europhys Lett	2,99656	16
343	E10 -A 10	DFT	**Dragos-Victor Anghel**, Scattering of phonons on two-level systems in disordered crystals, **Europhys. Lett.** 83, 56004 (2008)	2008	EPL – Europhys Lett	2,99656	14
344	E10 -A 11	DFT	**Dragos-Victor Anghel**, Anisotropic interaction of two-level systems with acoustic waves in disordered cubic crystals, **Phys. Rev. B** 78, 094202 (2008)	2008	PHYSICAL REVIEW B	2,62323	0
345	E10 -A 13	DFT	R. Citro, **S. Cojocaru**, M. Marinaro, Bond stretching phonon anomalies due to incommensurate charge density wave instabilities in high-Tc, **Eur. Phys. J. B**, 63, 179 (2008)	2008	Eur. Phys. J. B	1,27290	24
346	E10 -A 14	DFT	**Dragos-Victor Anghel,** The thermodynamic limit for fractional exclusion statistic, **J. Phys. A: Math. Theor.** 40, F1013 (2007)	2007	J PHYS A-MATH THEOR	1,54639	2
347	E10 -A 15	DFT	T. Kuhn, **Dragos-Victor Anghel** , Y. M Galperin, and M. Manninen, Interaction of Lamb modes with two-level systems in amorphous nanoscopic membranes, **Phys. Rev. B** 76, 165425 (2007)	2007	PHYSICAL REVIEW B	2,62323	0
348	E10 -A 16	DFT	**Dragos-Victor Anghel**, T. Kuhn, Y. M Galperin, and M. Manninen, Interaction of two-level systems in amorphous materials with arbitrary phonon fields, **Phys. Rev. B** 75, 064202 (2007)	2007	PHYSICAL REVIEW B	2,62323	1
349	E10 -A 17	DFT	**Dragos-Victor Anghel** and T. Kuhn, Quantization of the elastic modes in an isotropic plate, **J. Phys. A: Math. Theor.** 40 10429 (2007)	2007	J PHYS A-MATH THEOR	1,54639	3
350	E10 -A 25	DFT	V. Barsan and **S. Cojocaru**, Physical applications of a simple approximation of Bessel functions of integer order **Eur. J. Phys**. 28, 983 (2007)	2007	Eur. J. Phys.	0,64058	1
351	E10 -A 26	DFT	**S. Cojocaru**, R. Citro and M. Marinaro, Isotope effect and bond-stretching phonon anomaly in high-Tc cuprates **Eur. Phys. J. B,** 73, 509 (2010)	2010	Eur. Phys. J. B	1,27290	10
352	E10 -A 27	DFT	**S. Cojocaru,** Magnon gas and deviation from the Bloch law in a nanoscale ferromagnet, **Solid State Comm.** 151, 1780 (2011)	2011	Solid State Commun.	1,4	0
353	E10 -A 28	DFT	**S. Cojocaru**, R. Citro, M. Marinaro, High-energy kink in the single-particle spectra of cuprates, **Physica B**, 403, 1165 (2008)	2008	Physica B	0,61001	2
354	E10 -A 29	DFT	**S. Cojocaru**, R. Citro, and M. Marinaro, Anomalous bond stretching phonons as a probe of charge fluctuations in perovskites, **Physica C**, 460-462, 1155 (2007)	2007	Physica C	0,75264	1
355	E10 -A 30	DFT	R. Citro, **S. Cojocaru**, and M. Marinaro, Effective electron-phonon coupling in the Hubbard-Holstein model in presence of strong correlations and density fluctuations, **Physica C** , 460-462, 1055 (2007)	2007	Physica C	0,75264	1
356	E10 -A 31	DFT	**S. Cojocaru**, R. Citro, M. Marinaro, High-energy anomaly and self-energy effects in ARPES spectra of cuprates, **Journal of Optoelectronics and Advanced Materials**, Vol. 10, no. 7, july 2008, p. 1651 – 1654	2008	Journal of Optoelectronics and Advanced Materials Rapid Communications	0,32990	9
357	E10 -A 34	DFT	**Dragos-Victor Anghel**, Fractional exclusion statistics in general systems with interaction, **Phys. Lett. A**, 372, 5745 (2008)	2008	PHYS LETT A	1,59679	4
358	E10 -A 44	DFT	**G. A. Nemnes, C. Visan**, S. Antohe, Thermopower of atomic-sized wurtzite AlN wires, Physica E, doi:10.1016/j.physe.2011.07.014	2011	PHYSICA E	0,75732	2
359	E11 -A 12-1	DFN	Ascher, P., Audirac, L., Adimi, N., Blank, B., **Borcea, C.**, Brown, B. A., Companis, I., Delalee, F., Demonchy, C. E., Santos, F. de Oliveira, Giovinazzo, J.,Grevy, S., Grigorenko, L. V., Kurtukian-Nieto, T., Leblanc, S., Pedroza, J. -L., Perrot, L., Pibernat, J.,Serani, L., Srivastava, P. C, Thomas, J. -C. , . Direct Observation of Two Protons in the Decay of (54)Zn, **Phys Rev Lett** 107 (2011) 102502	2011	PHYSICAL REVIEW LETTERS	7,98625	0
360	E11 -A 12-10	DFN	Balabanski D. L.; **Ionescu-Bujor M; Iordachescu A.;** Bazzacco D; Brandolini F; **Bucurescu D;** Chmel S; Danchev M; De Poli M; Georgiev G; Haas H; Huebel H; **Marginean N;** Menegazzo R; Neyens G; Pavan P; Alvarez C. Rossi; Ur C. A; Vyvey K; Frauendorf S; Spin, quadrupole moment, and deformation of the magnetic-rotational band head in (193)Pb; **Phys Rev C** Vol 83 Iss 1 Art No 014304, 2011	2011	Physical Review C	1,24767	1
361	E11 -A 12-100	DFN	**M.Stanoiu**, D.Sohler, O.Sorlin, F.Azaiez, Zs.Dombradi, B.A.Brown, M.Belleguic, **C.Borcea**, C.Bourgeois, Z.Dlouhy, Z.Elekes, Zs.Fulop, S.Grevy, D.Guillemaud-Mueller, F.Ibrahim, A.Kerek, A.Krasznahorkay, M.Lewitowicz, S.M.Lukyanov, S.Mandal, J.Mrazek, **F.Negoita**, Yu.-E.Penionzhkevich, Zs.Podolyak, P.Roussel-Chomaz, M.G.Saint-Laurent, H.Savajols, G.Sletten, J.Timar, C.Timis, A.Yamamoto, Disappearance of the N = 14 shell gap in the carbon isotopic chain, **Phys.Rev. C** 78, 034315 (2008)	2008	Physical Review C	1,24767	4
362	E11 -A 12-101	DFN	I.Mukha, L.Grigorenko, K.Summerer, L.Acosta, M.A.G.Alvarez, E.Casarejos, A.Chatillon, D.Cortina-Gil, J.M.Espino, A.Fomichev, J.E.Garcia-Ramos, H.Geissel, J.Gomez-Camacho, J.Hofmann, O.Kiselev, A.Korsheninnikov, N.Kurz, Yu.Litvinov, I.Martel, C.Nociforo, W.Ott, M.Pfutzner, C.Rodriguez-Tajes, E.Roeckl, **M.Stanoiu**, H.Weick, P.J.Woods, Proton-proton correlations observed in two-proton decay of 19Mg and 16Ne, **Phys.Rev. C** 77 061303 (2008)	2008	Physical Review C	1,24767	0
363	E11 -A 12-102	DFN	M. Fantuzi, C.M. Petrache, D. Mengoni, M. Axiotis, D. Bazzacco, G. Benzoni, P.G. Bizzeti, A.M. Bizzeti-Sona, N. Blasi, A. Bracco, G. de Angelis, E. Farnea, A. Gadea, Th. Kroll, S. Leoni, H.L. Liu,S. Lunardi, **N. Marginean,** R. Menegazzo, D.R. Napoli, M. Nespolo, P. Pavan, C. Rossi Alvare, P. Spolaore, C.A. Ur, R. Venturelli, F.R. Xu; Nuclear spectroscopy near the proton drip line in the lanthanide region: The 122La nucleus; **Eur Phys J A** vol. 38, p.43 (2008)	2008	European Physical Journal A	1,10519	3

364	E11 -A 12-103	DFN	M. -D. Salsac, F. Haas, S. Courtin, A .Algora, C.Beck, S.Beghini, B.R.Behera, R.Chapman, L. Corradi, Zs. Dombradi, E. Farnea, E. Fioretto, A.Gadea, D.G.Jenkins, A.Latina, D.Lebhertz, S. Lenzi, X. Liang, **N. Marginean,** G. Montagnoli, D.Napoli, P.Papka, I.Pokrovski, G.Pollarolo, M. Rousseau, E. Sahin, A. Sanchez i Zafra, F. Scarlassara, D.Sohler, A.M.Stefanini, S.Szilner, M.Trotta, C.A. Ur, F. Della Vedova, Z.M. Wang, K.T. Wiedemann; Decay of a narrow and high spin 24Mg + 24Mg resonance; **Nucl Phys A** vol 801, iss 1 (2008)	2008	NUCLEAR PHYSICS A	1,09321	4
365	E11 -A 12-104	DFN	Mihailescu, L. C; **Borcea, C**; Koning, A. J; Pavlik, A; Plompen, A. J. M.; High resolution measurement of neutron inelastic scattering and (n,2n) cross-sections for Bi-209; **Nucl Phys A** Vol 799 Pag 1-29 2008	2008	NUCLEAR PHYSICS A	1,09321	9
366	E11 -A 12-105	DFN	A. Tudora, G. Vladuca, F.-J. Hambsch, **D. Filipescu**, S. Oberstedt; Prompt fission neutron multiplicity and spectrum calculations for thermal and fast neutron induced reactions on 233,231Pa nucle; **Annals of Nucl En**, Vol 35, Iss 6, 2008, Pag 1131-1139	2008	Annals of Nucl E	1,040	0
367	E11 -A 12-106	DFN	Y Fujita, B Rubio, T Adachi, F Molina, A Algora, GPA Berg, P von Brentano, J Buscher, T Cocolios, D De Frenne, C Fransen, H Fujita, K Fujita, W Gelletly, K Hatanaka, M Huyse, O Ivanov, Yu Kudryavtsev, E Jacobs, D Jordan, K Nakanishi, **A Negret**, D Pauwels, AB Perez-Cerdan, N Pietralla, Z Podolyak, L Popescu, R Raabe, Y Sakemi, M Sawicka, Y Shimbara, Y Shimizu, T Shizuma, Y Tameshige, A Tamii, P Van den Bergh, J Van de Walle, P Van Duppen, M Yosoi and K O Zell; Gamow-Teller transitions in exotic pf-shell nuclei relevant to supernova explosion; **J of Phys G** Vol 35, Art No 014041 (2008)	2008	J PHYS G NUCL PARTIC	1,00000	0
368	E11 -A 12-107	DFN	Lhersonneau, G; Alyakrinskiy, O; Bajeat, O; Barzakh, AE; Dubois, M; Eleon, C; Essabaa, S; Fedorov, DV; Gaubert, G; Ionan, AM; Ivanov, VS; Jardin, P; Lanchais, A; Lau, C; Leroy, R; Mezilev, KA; Mhamed, MC; Moroz, FV; Orlov, SY; Panteleev, VN; Rizzi, V; Roussiere, B; Saint Laurent, MG; **Stroe, L**; Tecchio, LB; Villari, ACC; Volkov, YM; Tests of high-density UC targets developed at Gatchina for neutron-rich radioactive-beam facilities; **Nucl Instrum & Meth B** Vol 266 Iss 19-20 Pag 4326 - 4329 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	10
369	E11 -A 12-108	DFN	Panteleev, VN; Barzakh, AE; Essabaa, S; Fedorov, DV; Ionan, AM; Ivanov, VS; Lau, C; Leroy, R; Lhersonneau, G; Mezilev, KA; Molkanov, P; Moroz, FV; Orlov, SY; **Stroe, L**; Tecchio, LB; Villaric, ACC; Volkov, YM; Electron beam-plasma ionizing target for the production of neutron-rich nuclides; **Nucl Instrum & Meth B** Vol 266 Iss 19-20 Pag 4294-4297 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	10
370	E11 -A 12-109	DFN	Panteleev, VN; Alyakrinskiy, O; Barbui, M; Barzakh, AE; Dubois, M; Eleon, C; Essabaa, S; Fedorov, DV ; Gaubert, G; Ionan, AM; Ivanov, VS; Jardin, P; Lau, C; Leroy, R; Lhersonneau, G; Mezilev, KA; Mhamed, C; Molkanov, PL; Moroz, FV; Orlov, SY; Saint Laurent, MG; **Stroe, L**; Tecchio, LB; Tonezzer, M; Villari, ACC; Volkov, YM; Studies of uranium carbide targets of a high density; **Nucl Instrum & Meth B** Vol 266 Iss 19-20 Pag 4247-4251 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	2
371	E11 -A 12-11	DFN	Daugas, J. M., Matea, I., Delaroche, J. P., Pfutzner, M., Sawicka, M., Becker, F., Belier, G., Bingham, C. R., **Borcea, R.**, Bouchez, E., **Buta, A.**, Dragulescu, E., Georgiev, G., Giovinazzo, J., Girod, M., Grawe, H., Grzywacz, R., Hammache, F., Ibrahim, F., Lewitowicz, M., Libert, J., Mayet, P., Meot, V., **Negoita, F.**, De Oliveira Santos, F., Perru, O., Roig, O., Rykaczewski, K., Saint-Laurent, M. G., Sauvestre, J.E., Sorlin, O., **Stanoiu, M.**, Stefan, I., Stodel, C., Theisen, C., Verney, D. Zylicz, J., Beta-decay measurements for N > 40 Mn nuclei and inference of collectivity for neutron-rich Fe isotopes , **Phys Rev C** Volume: 83 (2011) 054312	2011	Physical Review C	1,24767	0
372	E11 -A 12-110	DFN	M. Romoli, E. Vardaci, A. Anastasio, C. Boiano, R. Bonetti, F. Cassese, D. Corti, B. D'Aquino, A. DeRosa, P. Di Meo, S. Energico, F. Farinon, **T. Glodariu**, A. Guglietmetti, G. Inglima, M. La Commara, C. Manea, B. Martin, V. Masone, C. Mazzocchi, M. Mazzocco, Y. Mizoi, M. Nicoletto, L. Parascandolo, P. Parascandolo, D. Pierroutsakou, G. Pontoriere, N. Randazzo, L. Roscilli, M. Sandoli, C. Signorini, V. Sipala, F. Soramel, **L. Stroe**, M. Valentino, Y. Watanabe; EXPADES: A new detection system for charged particles in experiments with RIBs; **Nucl Instrum & Meth B** Vol 266 Iss 19-20 Pag 4637-4642 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	6
373	E11 -A 12-111	DFN	Blank, B; Audirac, L; Canchel, G; Delalee, F; Dernonchy, C. E; Giovinazzo, J; Hay, L; Hellmuth, P; Hulkari, J; Leblanc, S; List, S; Marchand, C; Matea, I; Pedroza, J. -L; Plbernat, J; Reblia, A; Serani, L; de Oliveira Santos, F; Grevy, S; Perrot, L; Stodel, C; Thomas, J. C; **Borcea, C**; Dossat, C; de Oliveira, R.; A time projection chamber to study two-proton radioactivity; **Nucl Instr& Meth B** Vol 266 Iss 19-20 Pag 4606-4611 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	6
374	E11 -A 12-112	DFN	**M. Stanoiu**, K. Summerer, I. Mukha, A. Chatillon, E. Cortina Gil, M. Heil,J. Hoffman, O.A. Kiselev, N. Kurz, W. Ott, . A novel Si strip array to investigate reaction and decay mechanisms, **Nucl Instr and Meth B** 266 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	11
375	E11 -A 12-113	DFN	Roca, A., Nievaart, V.A., Moss, R.L., Stecher-Rasmussen, F., **Zamfir, N.V.**; Validating a MCNPX model of Mg(Ar) and TE(TE) ionisation chambers exposed to 60Co gamma rays; **Radiat Prot Dosim** Vol 129 (2008), pp. 365-371	2008	Radiat. Prot. Dosim.,	0,85714	1
376	E11 -A 12-114	DFN	**D.G. Ghita, G. Cata-Danil, D. Bucurescu, I. Cata-Danil, M. Ivascu, C. Mihai, G. Suliman, L. Stroe, T. Sava, N.V. Zamfir**; 124Te and the E(5) critical point symmetry; **Int J of Mod Phys E** Vol 17(2008)Pages 1453-1466	2008	International Journal of Modern Physics E	0,26099	6
377	E11 -A 12-115	DFN	Mukha, I; Summerer, K; Acosta, L; Alvarez, MAG; Casarejos, E; Chatillon, A; Cortina-Gil, D; Espino, J; Fomichev, A; Garcia-Ramos, JE; Geissel, H; Gomez-Camacho, J; Grigorenko, L; Hoffmann, J; Kiselev, O; Korsheninnikov, A; Kurz, N; Litvinov, Y; Martel, I; Nociforo, C; Ott, W; Pfutzner, M; Rodriguez-Tajes, C; Roeckl, E; **Stanoiu, M**; Weick, H; Woods, PJ; Observation of two-proton radioactivity of Mg-19 by tracking the decay products; **Phys Rev Lett**, Vol 99 Iss 18 Article Number: 182501, 2007	2007	PHYSICAL REVIEW LETTERS	7,98625	0
378	E11 -A 12-116	DFN	B.Bastin, S.Grevy, D.Sohler, O.Sorlin, Zs.Dombradi, N.L.Achouri, J.C.Angelique, F.Azaiez, D.Baiborodin, **R.Borcea,** C.Bourgeois, **A.Buta**, A.Burger, R.Chapman, J.C.Dalouzy, Z.Dlouhy, A.Drouard, Z.Elekes, S.Franchoo, S.Iacob, B.Laurent, M.Lazar, X.Liang, E.Lienard, J.Mrazek, L.Nalpas, **F.Negoita**, N.A.Orr, Y.Penionzhkevich, Zs.Podolyak, F.Pougheon, P.Roussel-Chomaz, M.G.Saint-Laurent, **M.Stanoiu**, I.Stefan, F.Nowacki, A.Poves, Collapse of the N=28 shell closure in Si-42, **Phys. Rev.Lett** 99 022503 (2007)	2007	PHYSICAL REVIEW LETTERS	7,98625	0
379	E11 -A 12-117	DFN	Giovinazzo, J; Blank, B; **Borcea, C**; Canchel, G; Dalouzy, J.-C; Demonchy, C. E; Santos, F. de Oliveira; Dossat, C; Grevy, S; Hay, L; Huikari, J; Leblanc, S; Matea, I; Pedroza, J.-L; Perrot, L; Pibernat, J; Serani, L; Stodel, C;Thomas, J.-C; First direct observation of two protons in the decay of Fe-45 with a time-projection chamber; **Phys Rev Lett** Vol 99 Iss 10 Article Number: 102501 2007	2007	PHYSICAL REVIEW LETTERS	7,98625	4

380	E11 -A 12-118	DFN	Van de Walle, J; Aksouh, F; Ames, F; Behrens, T; Bildstein, V; Blazhev, A; Cederkall, J; Clement, E; Cocolios, TE; Davinson, T; Delahaye, P; Eberth, J; Ekstrom, A; Fedorov, DV; Fedosseev, VN; Fraile, LM; Franchoo, S; Gernhauser, R; Georgiev, G; Habs, D; Heyde, K; Huber, G; Huyse, M; Ibrahim, F; Ivanov, O; Iwanicki, J; Jolie, J; Kester, O; Koster, U; Kroll, T; Krucken, R; Lauer, M; Lisetskiy, AF; Lutter, R; Marsh, BA; Mayet, P; Niedermaier, O; Nilsson, T; Pantea, M; Perru, O; Raabe, R; Reiter, P; Sawicka, M; Scheit, H; Schrieder, G; Schwalm, D; Seliverstov, MD; Sieber, T; Sletten, G; Smirnova, N; **Stanoiu, M;** Stefanescu, I; Thomas, JC; Valiente-Dobon, JJ; Van Duppen, P; Verney, D; Voulot, D; Warr, N; Weisshaar, D; Wenander, F; Wolf, BH; Zielinska, M; Coulomb excitation of neutron-rich Zn isotopes: First observation of the 2(1)(+) state in (80)Zn; **Phys Rev Lett** Vol 99 Iss 14 Article Number: 142501, 2007	2007	PHYSICAL REVIEW LETTERS	7,98625	0
381	E11 -A 12-119	DFN	**M. Ionescu-Bujor, A. Iordachescu, N. Marginean,** C.A. Ur, **D. Bucurescu, G. Suliman,** D.L. Balabanski, F. Brandolini, S. Chmel, P. Detistov, K.A. Gladnishki, H. Hubel, S. Mallion, **R. Marginean**, N.H. Medina, D.R. Napoli, G. Neyens, P. Pavan, R.V. Ribas, C. Rusu, K. Turzo, N. Vermeulen; Shape coexistence in neutron-deficient Pb nuclei probed by quadrupole moment measurements; **Phys Lett B**, Vol 650 (2-3), 141-147, 2007	2007	PHYSICS LETTERS B	3,62428	0
382	E11 -A 12-12	DFN	Banu A, Trache L., Carstoiu F., Achouri N.L., Bonaccorso A., Catford WN, Chartier M, Dimmock M, Fernandez-Dominguez B, Freer M, Gaudefroy L, Horoi M, Labiche M, Laurent B., Lemmon, R. C., **Negoita, F**., Orr, N. A., Paschalis, S., Patterson, N., Paul, E. S., Petri, M., Pietras, B., Roeder, B. T., Rotaru, F., Roussel-Chomaz, P., Simmons, E., Thomas, J. S., Tribble, R. E. , Structure of (23)Al from the one-proton breakup reaction and astrophysical implications , **Phys Rev C** 84 015803	2011	Physical Review C	1,24767	0
383	E11 -A 12-120	DFN	**Bucurescu D**, Rusu C, **Marginean N,** Ur CA, de Angelis G, Corradi L, Bazzacco D, Beghini S, Della Vedova F, Duchene G, Farnea E, Faul T, Fioretto E, Gadea A, Gelletly W, Guiot B, **Ionescu-Bujor M, Iordachescu A,** Landown SD, Lenzi SM, Lunardi S, Mason P, **Mihai C, Marginean R,** Menegazzo R, Montagnoli G, Napoli D, Podolyak Z, Regan PH, Scarlassara F, Stefanini AM, **Suliman G,** Szilner S, Trotta M, Valiente-Dobon JJ, Zhang Y. H.; gamma-ray spectroscopy of the neutron-rich nuclei Rb-89, Y-92, and Y-93 with multinucleon transfer reactions; **Phys Rev C** Vol 76 Iss 6 Art No: 064301 (2007)	2007	Physical Review C	1,24767	0
384	E11 -A 12-121	DFN	M.Axiotis, S.M.Lenzi, **N.Marginean,** D.R.Napoli, C.A.Ur, F.Brandolini, E.Farnea, A.Gadea, A.Algora, G.de Angelis, D.Bazzacco, P.G.Bizzeti, A.Bizzeti-Sona, P.von Brentano, J.A.Cameron, A.Dewald, H.Grawe, C.A.Kalfas, S.Lunardi, T.Martinez, C.T.Papadopoulos, Zs.Podolyak, C.Rossi Alvarez, J.Sanchez-Solano, D.Tonev, R.Vlastou; High-spin gamma-ray spectroscopy in 52Mn; **Phyl Rev C** Vol 76 Iss 1, Art. No. 014303, 2007	2007	Physical Review C	1,24767	2
385	E11 -A 12-122	DFN	F.Della Vedova, S.M.Lenzi, **M.Ionescu-Bujor, N.Marginean,** M.Axiotis, D.Bazzacco, A.M.Bizzeti-Sona, P.G.Bizzeti, A.Bracco, F.Brandolini, **D.Bucurescu**, E.Farnea, **A.Iordachescu,** S.Lunardi, T.Martinez, P.Mason, R.Menegazzo, B.Million, D.R.Napoli, M.Nespolo, P.Pavan, C.Rossi Alvarez, C.A.Ur, R.Venturelli, A.P.Zuker; Isospin symmetry breaking at high spin in the mirror nuclei 35Ar and 35Cl; **Phys Rev C** Vol 75 Iss 3, Art. No. 034317, 2007	2007	Physical Review C	1,24767	0
386	E11 -A 12-123	DFN	S.Szilner, C.A.Ur, L.Corradi, **N.Marginean,** G.Pollarolo, A.M.Stefanini, S.Beghini, B.R. Behera, E.Fioretto, A.Gadea, B.Guiot, A.Latina, P.Mason, G.Montagnoli, F.Scarlassara, M. Trotta, G.deAngelis, F.della Vedova, E.Farnea, F.Hass, S.Lenzi, S.Lunardi, **R.Marginean,** R. Menegazzo, D.R. Napoli, M. Nespolo, I.V. Pokrovsky, F. Recchia, M.Romoli, M.-D.Salsac, N.Soic, J.J.Valiente-Dobon; Multinucleon transfer reactions in closed-shell nuclei; **Phys Rev C** Vol 76 Iss 2, Art. No. 024604, 2007	2007	Physical Review C	1,24767	0
387	E11 -A 12-124	DFN	D.Tonev, G.de Angelis, S.Brant, S.Frauendorf, P.Petkov, A.Dewald, F.Donau, D.L.Balabanski, Q.Zhong, P.Pejovic, D.Bazzacco, P.Bednarczyk, F.Camera, D.Curien, F.Della Vedova, A.Fitzler, A.Gadea, G.Lo Bianco, S.Lenzi, S.Lunardi, **N.Marginean,** O.Moller, D.R.Napoli, R.Orlandi, E.Sahin, A.Saltarelli, J.Valiente-Dobon, K.O.Zell, Jing-ye Zhang, Y.H.Zhang; Question of dynamic chirality in nuclei: The case of 134Pr; **Phys Rev C** Volume 76, Iss 4, Art No 044313 (2007)	2007	Physical Review C	1,24767	0
388	E11 -A 12-125	DFN	A. Hodsdon, R. Chapman, X .Liang, F. Haas, J. Ollier, E. Caurier, F. Nowacki, M.D. Salsac, F. Azaiez, S. Beghini, B. Behera, M. Burns, L. Corradi, D. Curien, A.N. Deacon, Zs.Dombradi, E. Farnea, E. Fioretto, A. Gadea, A.Jungclaus, K.L. Keyes, A. Latina, **N. Marginean,** D. Napoli, G. Montagnoli, D.O. Donnell, A. Papenberg, F.Scarlasara, J.F.Smith, K.M.Spohr**, M.Stanoiu,** A.Stefanini, S.Szilner, M.Trotta, C.A.Ur, D.Verney, Z.Wang; Spectroscopy of neutron-rich 37P; **Phys Rev C** Vol 75 Iss 3, Art. No. 034313, 2007	2007	Physical Review C	1,24767	0
389	E11 -A 12-126	DFN	S. Lunardi, S. M. Lenzi, F. Della Vedova, E. Farnea, A. Gadea, **N. Marginean,** D. Bazzacco, S. Beghini, P. G. Bizzeti, A. M. Bizzeti-Sona, D. Bucurescu, L. Corradi, A. N. Deacon, G. de Angelis, E. Fioretto, S. J. Freeman, M. **Ionescu-Bujor, A. Iordachescu,** P. Mason, D. Mengoni, G. Montagnoli, D. R. Napoli, F. Nowacki, R. Orlandi, G. Pollarolo, F.Recchia, F.Scarlassara, J.F.Smith, A.M. Stefanini, S.Szilner, C.A.Ur, J.J.Valiente-Dobon, B.J. Varley; Spectroscopy of neutron-rich Fe isotopes populated in the 64Ni+238U reaction; **Phys Rev C** Vol 76 Iss 3, Art. No. 034303, 2007	2007	Physical Review C	1,24767	0
390	E11 -A 12-127	DFN	G. A. Jones, P. H. Regan, Zs. Podolyak, N. Yoshinaga, K. Higashiyama, G. de Angelis, Y. H. Zhang, A. Gadea, C. A. Ur, M. Axiotis, D. Bazzacco, **D. Bucurescu**, E. Farnea, W. Gelletly, **M. Ionescu-Bujor, A. Iordachescu,** Th. Kroll, S. D. Langdown, S. Lenzi, S. Lunardi, **N. Marginean,** T. Martinez, N. H. Medina, R. Menegazzo, D. R. Napoli, B. Quintana, B. Rubio, C. Rusu, R. Schwengner, D. Tonev, J. J. Valiente Dobon, and W. von Oertzen; Yrast studies of 80,82Se using deep-inelastic reactions; **Phys Rev C** Vol 76 Iss 4, Art.No. 044313, 2007	2007	Physical Review C	1,24767	0
391	E11 -A 12-128	DFN	**C.Mihai, N.V. Zamfir, D. Bucurescu, G. Cata-Danil, I. Cata-Danil, D.G.Ghita, M.Ivascu, T. Sava, L. Stroe, G. Suliman**; Gamma-band staggering and E(5)-type structure: 64Zn; **Phys Rev C** Vol 75 Art No 044302 (2007)	2007	Physical Review C	1,24767	0
392	E11 -A 12-129	DFN	Y. Oktem, D. L. Balabanski, B. Akkus, C. W. Beausang, M. Bostan, R. B. Cakirli, R. F. Casten, M. Danchev, M. Djongolov, M. N. Erduran, S. Erturk, K. A. Gladniski, G. Gurdal, J. Tm. Goon, D. J. Hartley, A. A. Hecht, R. Krucken, N. Nikolov, J. R. Novak, G. Rainovski, L. L. Riedinger, I. Yigitoglu, **N. V. Zamfir,** and O. Zeidan; High-spin states in 191,193Au and 192Pt: Evidence for oblate deformation and triaxial shapes; **Phys Rev C** Vol 76, Art No 044315 (2007)	2007	Physical Review C	1,24767	0
393	E11 -A 12-13	DFN	Luis, R., Bermudez, J., David, J. C., Ene, D., Goncalves, I. F., Kadi, Y., Kharoua, C., **Negoita, F**., Rocca, R., Romanets, Y., Tecchio, L., Vaz, P; EURISOL multimegawatt target unit-MAFF configuration: dosimetry and activation studies; **Nucl Technology** 175 (2011) 445-449	2011	Nucl Technology	1,143	7

394	E11 -A 12-130	DFN	S.F. Ashley, P.H. Regan, K. Andgren, E.A. McCutchan, **N.V. Zamfir,** L. Amon,R.B. Cakirli, R.F. Casten, R.M.Clark, W. Gelletly, G. Gurdal, K.L. Keyes, D.A. Meyer, M.N. Erduran, A. Papenberg, N.Pietralla, C. Plettner, G. Rainovski, R.V. Ribas, N.J. Thomas, J. Vinson, D.D. Warner, V. Werner, E. Williams, H.L. Liu and F.R. Xu; Intrinsic state lifetimes in 103Pd and 106,107Cd; **Phys Rev C** Vol 76, Art No 064302 (2007)	2007	Physical Review C	1,24767	0
395	E11 -A 12-131	DFN	McCutchan EA, Bonatsos D, **Zamfir NV,** Casten RF; Staggering in gamma-band energies and the transition between different structural symmetries in nuclei; **Phys Rev C** Vol 76 Iss 2 Art No 024306 (2007)	2007	Physical Review C	1,24767	0
396	E11 -A 12-132	DFN	L. Popescu, C. Baumer, A. M. van den Berg, D. Frekers, D. De Frenne, Y. Fujita, E. W. Grewe, P. Haefner, M. N. Harakeh, M. Hunyadi, M.A. de Huu, E. Jacobs, H. Johansson, A. Korff, **A. Negret**, P. von Neumann-Cosel, S. Rakers, A. Richter, N. Ryezayeva, A. Shevchenko, H. Simon and H. J. Wortche; Low-lying GT+ strength in 64Co studied via the 64Ni(d,2He)64Co reaction; **Phys Rev C** Vol 75, Art No 054312 (2007)	2007	Physical Review C	1,24767	0
397	E11 -A 12-133	DFN	E.-W. Grewe, D. Frekers, S. Rakers, T. Adachi, C. Baumer, N.T. Botha, H. Dohmann, H. Fujita, Y. Fujita, K. Hatanaka, K. Nakanishi, **A. Negret**, R. Neveling, L. Popescu, Y. Sakemi, Y. Shimbara, Y. Shimizu, F.D. Smit, Y. Tameshige, A. Tamii, J. Thies, P. von Brentano, M. Yosoi and R. G. T. Zegers; The (3He,t) reaction on the double-beta decay nucleus 48Ca and the importance of nuclear matrix elements; **Phys Rev C** Vol 76, Art No 054307 (2007)	2007	Physical Review C	1,24767	0
398	E11 -A 12-134	DFN	Gaudefroy, L; Sorlin, O; Beaumel, D; Blumenfeld, Y; Dombradi, Z; Fortier, S; Franchoo, S; Gelin, M; Gibelin, J; Grevy, S; Hammache, F; Ibrahim, F; Kemper, K. W; Kratz, K.-L; Lukyanov, S. M; Monrozeau, C; Nalpas, L; Nowacki, F; Ostrowski, AN; Otsuka, T;Penionzhkevich, Yu.-E; Piekarewicz, J; Pollacco, E.C; Roussel-Chomaz, P; Rich, E; Scarpaci, J. A; St Laurent, M. G; Sohler, D; **Stanoiu, M**; Suzuki, T; Tryggestad, E; Verney, D; Comment on "Reduction of the spin-orbit splittings at the n=28 shell closure"; **Physical Review Letters** Vol 99 Iss 9 Article Number: 099202, 2007	2007	Physical Review C	1,24767	0
399	E11 -A 12-135	DFN	White, E. R.; Mach, H; Fraile, LM; Koster, U; Arndt, O; Blazhev, A; Boelaert, N; Borge, MJG; Boutami, R; Bradley, H; Braun, N; Dlouhy, Z; Fransen, C; Fynbo, HOU; Hinke, C; Hoff, P; Joinet, A; Jokinen, A; Jolie, J; Korgul, A; Kratz, KL; Kroll, T; Kurcewicz, W; Nyberg, J; Reillo, EM; Ruchowska, E; Schwerdtfeger, W; Simpson, GS; **Stanoiu, M**; Tengblad, O; Thirolf, PG; Ugryumov, V; Walters, WB; Lifetime measurement of the 167.1 keV state in (41)Ar; **Phys Rev C** Vol 76 Iss 5 Article Number: 057303, 2007	2007	Physical Review C	1,24767	0
400	E11 -A 12-136	DFN	Delgado-Aparicio, L; Stutman, D; Tritz, K; Vero, R; Finkenthal, M; **Suliman, G**; Kaita, R; Majeski, R; Stratton, B; Roquemore, L; Tarrio, C; High-efficiency fast scintillators for "optical" soft x-ray arrays for laboratory plasma diagnostics; **Appl Opt** Vol 46 Iss 24 Pag 6069-6075 2007	2007	App. Opt.	1,46686	0
401	E11 -A 12-137	DFN	Blank, B; **Borcea, C**; Canchel, G; Demonchy, C.-E; Santos, F. de Oliveira; Dossat, C; Giovinazzo, J; Grevy, S; Hay, L; Hellmuth, P; Leblanc, S; Matea, I; Pedroza, J-L; Perrot, L; Pibernat, J; Rebii, A; Serani, L; Thomas, J. C; Production cross-sections of proton-rich Ge-70 fragments and the decay of Zn-57 and Ge-61 **Eur Phys J A** Vol 31 Iss 3 Pag 267-272 2007	2007	European Physical Journal A	1,10519	23
402	E11 -A 12-138	DFN	C.Dossat, N.Adimi, F.Aksouh, F.Becker, A.Bey, B.Blank, **C.Borcea**, **R.Borcea**, A.Boston, M.Caamano, G.Canchel, M.Chartier, D.Cortina, S.Czajkowski, G.de France, F.de Oliveira Santos, A.Fleury, G.Georgiev, J.Giovinazzo, S.Grevy, R.Grzywacz, M.Hellstrom, M.Honma, Z.Janas, D.Karamanis, J.Kurcewicz, M.Lewitowicz, M.J.Lopez Jimenez, C.Mazzocchi, I.Matea, V.Maslov, P.Mayet, C.Moore, M.Pfutzner, M.S.Pravikoff, **M.Stanoiu**, I.Stefan, J.C.Thomas, The decay of proton-rich nuclei in the mass A=36-56 region, **Nuclear Phys A** 792 18-86 (2007)	2007	NUCLEAR PHYSICS A	1,09321	0
403	E11 -A 12-139	DFN	Mihailescu, L. C; **Borcea, C**; Koning, A.J; Plompen, A.J.M; High resolution measurement of neutron inelastic scattering and (n, 2n) cross-sections for Cr-52 **Nucl Phys A** Vol 786 Pag 1-23 2007	2007	NUCLEAR PHYSICS A	1,09321	1
404	E11 -A 12-14	DFN	DiJulio D. D.; Cederkall J.; Fahlander C.; Ekstrom, A; Golubev, P; Mattsson, K; Rudolph, D; de Angelis, G; Aydin, S; Deo, A. Y; Farnea, E; Farrelly, G; Geibel, K; He, C; Iwanicki, J; Kempley, R; **Marginean, N**; Menegazzo, R; Mengoni, D; Orlandi, R; Podolyak, Z; Recchia, F; Reiter, P; Sahin, E; Smith, J; Soderstrom, P. A; Torres, D. A; Tveten, G. M; Ur, C. A; Valiente-Dobon, J. J; Wendt, A; Zielinska, M.; Electromagnetic properties of vibrational bands in (170)Er; **Eur Phys J** A Vol 47 Iss 2 Page: 25, 2011	2011	European Physical Journal A	1,10519	4
405	E11 -A 12-140	DFN	T. Adachi, Y. Fujita, P. von Brentano, G.P.A. Berg, C. Fransen, D. De Frenne, H. Fujita, K. Fujita, K. Hatanaka, M. Honma, E. Jacobs, J. Kamiya, K. Kawase, T. Mizusaki, K. Nakanishi, **A. Negret,** T. Otsuka, N. Pietralla, L. Popescu, Y. Sakemi, Y. Shimbara, Y. Shimizu, Y. Tameshige, A. Tamii, M. Uchida, T. Wakasa, M. Yosoi, K.O. Zell; Gamow-Teller transitions in pf-shell nuclei studied in (3He, t) reactions; **Nucl Phys A** Vol 788, 70c (2007)	2007	NUCLEAR PHYSICS A	1,09321	0
406	E11 -A 12-141	DFN	M.Trotta, A.M.Stefanini, S.Beghini, B.R.Behera, L.Corradi, E.Fioretto, A.Gadea, M.G. Itkis, G.N.Knyazheva, N.A.Kondratiev, E.M.Kozulin, **N.Marginean**, P. Mason, G. Montagnoli, I.V. Pokrovsky, R.N. Sagaidak, F. Scarlassara, R.Silvestri, S.Szilner; An overview of near-barrier fusion studies with stable beams; **Nucl Phys A** Vol 787 Iss 1-4, 134c - 143C, 2007	2007	NUCLEAR PHYSICS A	1,09321	15
407	E11 -A 12-142	DFN	Panteleev, VN; Alyakrinskiy, O; Andrighetto, A ; Barzakh, AE; Dubois, M; Eleon, C; Essabaa, S; Bajeat, O; Fedorov, DV; Gaubert, G; Ionan, AM; Ivanov, VS; Jardin, P; Lanchais, A; Lau, C; Leroy, R; Lhersonneau, G; Mhamed, C; Mezilev, KA; Molkanov, PL; Moroz, FV; Orlov, SY; Rizzi, V; Saint Laurent, MG; **Stroe, L**; Tecchio, LB; Villari, ACC; Volkov, YM; Recent developments and on-line tests of uranium carbide targets for production of nuclides far from stability; **Eur Phys J** ST Vol 150 Pag 297-300, 2007	2007	Eur. Phys. J.-Spec. Top.,	1,00802	11
408	E11 -A 12-143	DFN	D. Pierroutsakou, B. Martin, M. Mazzocco, **T. Glodariu,** R. Bonetti, A. De Rosa, F. Farinon, A. Guglielmetti, G. Inglima, M. La Commara, M. Romoli, M. Sandoli, C. Signorini, F. Soramel, **L. Stroe,** E. Vardaci; Light radioactive nuclear beams at LNL; **Eur. Phys. J.** ST 150, 47 (2007)	2007	Eur. Phys. J.-Spec. Top.,	1,00802	7
409	E11 -A 12-144	DFN	Mason, P; **Marginean, N**; Montagnoli, G; Beghini, S; Scarlassara, F; Farnea, E; Ur, CA; Meroni, A; Stefanini, AM; Corradi, L; Fioretto, E; Pokrovskiy, IV; Guiot, B; Gadea, A; Valiente-Dobn, JJ; Della Vedova, F; Orlandi, R; Sahin, E; Napoli, DR; Berti, L; Toniolo, N; Szilner, S; Trotta, M; Romoli, M; La Commara, M; Pierroutsakou, D; Sandoli, M; Pollarolo, G; Benzoni, G; The heavy-ion magnetic spectrometer PRISMA; **Eur Phys J**-ST Vol 150 Pages 359-361, 2007	2007	Eur. Phys. J.-Spec. Top.,	1,00802	0

410	E11 -A 12-145	DFN	Mazzocco, M; Signorini, C; Romoli, M; Bonetti, R; De Francesco, A; De Rosa, A; Di Pietro, M; Fortunato, L; **Glodariu, T**; Guglielmetti, A; Inglima, G; Ishikawa, T; Ishiyama, H; Kanungo, R; Khai, N; Jeong, S; La Commara, M; Martin, B; Miyatake, H; Motobayashi, T; Nomura, T; Pierroutsakou, D; Sandoli, M; Soramel, F; **Stroe, L**; Sugai, I; Tanaka, MH; Vardaci, E; Watanabe, Y; Yoshida, A; Yoshida, K; Elastic scattering for the system B-11+Bi-209 at Coulomb barrier energies; **Eur Phys J** ST, vol 150, Pag 37, 2007	2007	Eur. Phys. J.-Spec. Top.,	1,00802	0
411	E11 -A 12-146	DFN	Benzoni, G; Azaiez, F; Leoni, S; Battacharyya, S; **Borcea, R;** Bracco, A; Corradi, L; Curien, D; De France, G; Dombradi, Z; Fioretto, E; Franchoo, S; Grevy, S; Ibrahim, F; Iulian, S; Mukherjee, G; Navin, A; Pollarolo, G; Redon, N; Regan, PH; Rejmund, M; Schmitt, C; Sletten, G; Sohler, D; **Stanoiu, M**; Szilner, S; Verney, D; In-beam gamma spectroscopy using DIC with a radioactive Ne beam; **Eur Phys J**-ST Vol 150 Pag 83-86 2007	2007	Eur. Phys. J.-Spec. Top.,	1,00802	6
412	E11 -A 12-147	DFN	Buerger, A; **Stanoiu, M;** Azaiez, F; Dombradi, Z; Algora, A; Al-Khatib, A; Bastin, B; Benzoni, G; **Borcea, R**; Bourgeois, C; Bringel, P; Clement, E; Dalouzy, JC; Dlouhy, Z; Drouart, A; Engelhardt, C; Franchoo, S; Fulop, Z; Gorgen, A; Grevy, S; Hubel, H; Ibrahim, F; Korten, W; Mrazek, J; Navin, A; **Rotaru, F;** Roussel-Chomaz, P; Laurent, MG; Sletten, G; Sohler, D; Sorlin, O; Theisen, C; Timis, C; Verney, D; Williams, S; Spectroscopy of neutron-deficient nuclei around (36)Ca; **Eur Phys J**-ST Vol 150 Pag 89-91, 2007	2007	Eur. Phys. J.-Spec. Top.,	1,00802	15
413	E11 -A 12-148	DFN	Mihailescu, L. C; **Borcea, C**; Plompen, A. J. M.; Data acquisition with a fast digitizer for large volume HPGe detectors; **Nucl Instr & Meth A** Vol 578 Iss 1 Pag 298-305 2007	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	9
414	E11 -A 12-149	DFN	**M. Ionescu-Bujor, A. Iordachescu, N. Marginean,** C.A. Ur, **G. Suliman, D. Bucurescu,** D.L Balabanski, F. Brandolini, S. Chmel, K.A.Gladnishki, H.Hubel, **R.Marginean,** G.Neyens; Quadrupole Moments for Isomeric States with Normal and Intruder Configurations in Neutron-Deficient Pb Nuclei; **Acta Phys Pol B** Vol 38 Iss 4, 1249-1253, 2007	2007	ACTA PHYS POL B	0,55670	0
415	E11 -A 12-15	DFN	P. A. Soderstrom, F. Recchia, J. Nyberg, A. Al-Adili, A. Atac, S. Aydin, D. Bazzacco, P. Bednarczyk, B. Birkenbach, D. Bortolato, A. J. Boston, H.C.Boston, B.Bruynel, **D. Bucurescu** E. Calore, S. Colossimo, F .C. L. Crespi, N. Dosmem, J. Eberth, E. Farnea, F. Filmer, A. Gadea, A. Gottardo, X. Grave, J. Grebosz, R. Griffiths, M.Gulmini, T.Habermann, H.Hess, G. Jaworski, P. Jones, P. Joshi, D. S. Judson, R. Kempley, A. Khaplanov, E. Legay, D. Lersch, J. Ljungvall, A. Lopez-Martens, W. Meczynski, D. Mengoni, C. Michelagnoli, P.Molini, D.R. Napoli, R. Orlandi, G. Pascovici, A. Pullia, P. Reiter, E. Sahin, J. F. Smith, J. Strachan, D. Tonev, C. Unsworth, C. A. Ur, J. J. Valiente-Dobon, C. Veyssiere, A.Wiens; Interaction position resolution simulations and in-beam measurements of the AGATA HPGe detectors; **Nucl Instrum & Meth A** Vol 638 (2011) Pag 96-109	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
416	E11 -A 12-150	DFN	B. Martin, D. Pierroutsakou, G. Inglima, A. Boiano, A. De Rosa, M. La Commara, M. Romoli, M. Sandoli, C. Agodi, R. Alba, R. Coniglione, A. Del Zoppo, C. Maiolino, P. Piattelli, D. Santonocito, P. Sapienza , G. Cardella, E. De Filippo, A. Pagano, S. Pirrone, **T. Glodariu,** M. Mazzocco, C. Signorini; Prompt dipole gamma-ray emission in fusion heavy-ion collisions: Incident energy dependence; **Acta Phys Pol B** Vol 38 Iss 4 1473-1477 (2007)	2007	ACTA PHYS POL B	0,55670	0
417	E11 -A 12-151	DFN	G. Neyens, L. Atanasova, D. L. Balabanski, F. Becker, P. Bednarczyk, L. Caceres, J.Gerl, P. Doornenbal, M.Gorska, J.Grebosz, M.Hass, G.Ilie, N.Kurz, I.Kojouharov, R.Lozeva, A.Maj, M. Pfutzner, S. Pietri, Zs. Podolyak, W. Prokopowicz, T.R. Saitoh, H. Schaffner, G. Simpson, N. Vermeulen, E. Werner-Malento, J. Walker, H. J. Wollersheim, D. Bazzacco, G. Benzoni, A. Blazhev, N. Blasi, A. Bracco, C. Brandau, F.Camera, S.Chamoli, S.Chmel, F.C.L. Crespi, J.M.Daugas, M.De Rydt, P.Detistov, C. Fahlander, E. Farnea, G. Georgiev, K. Gladnishki, R.Hoischen, **M. Ionescu-Bujor, A. Iordachescu,** J.Jolie, A.Jungclaus, M. Kmiecik, A.Krasznahorkay, R.Kulessa, S.Lakshmi, G.Lo Bianco, S.Mallion, K.Mazurek, W.Meczynski, D.Montanari, S.Myalsky, O.Perru, D.Rudolph, G. Rusev, A. Saltarelli, R. Schwengner, J. Styczen, K.Turzo, J.J.Valiente-Dobon, O. Wieland, M.Zieblinski; g Factor Measurements on Relativistic Isomeric Beams Produced by Fragmentation and U-Fission: The g-Rising Project at GSI, **Acta Phys.Pol. B** Vol 38, 1237 (2007)	2007	ACTA PHYS POL B	0,55670	2
418	E11 -A 12-152	DFN	A.Gadea, E.Sahin, J.J.Valiente-Dobon, A.Dewald, E.Farnea, G.De Angelis, M.Axiotis, D.R.Napoli, R.Orlandi, F.Della Vedova, E.Fioretto, L.Corradi, A.M.Stefanini, A.Latina, **N.Marginean,** S.Szilner, O.Moller, B.Melon, D.Bazzacco, S.Beghini, S.M.Lenzi, S.Lunardi, G.Montagnoli, R.Menegazzo, F.Scarlassara, C.A.Ur, N.A.Kondratiev, E.M.Kozulin, G.Benzoni, A.Bracco, S.Brambilla, F.Camera, S.Leoni, B.Million, M.Pignanelli, G.Pollarolo, M.Trotta, P.G.Bizzeti, A.M.Bizzeti-Sona, D.Curien, G.Duchene, T.Faul, R.Chapman, X.Liang, F.Azaiez,S.J.Freeman,B.J.Varley, V.Pucknell; Recent Results on Neutron-Rich Nuclei Spectroscopy with the CLARA - PRISMA Setup; **Acta Phys Pol B** Vol 38 Iss4, 1311-1320, 2007	2007	ACTA PHYS POL B	0,55670	2
419	E11 -A 12-153	DFN	Ashley SF, Linnemann A, Jolie J, Regan P. H, Andgren K., Dewald A., McCutchan E. A, Melon B, Moeller O, **Zamfir N. V.,** Amon L, Boelaert N., Cakirli R. B., Casten R. F., Clark R. M, Fransen C., Gelletly W., Gurdal G., Heidemann M., Keyes K. L., Erduran M. N., Meyer D. A., Papenberg A., Plettner C., Rainovski G., Ribas R. V., Thomas N. J., Vinson J., Warner D.D., Werner V., Williams E; Lifetime determination of excited states in Cd-106; **Acta Phys Pol B** Vol 38 Iss 4 Pag 1385-1388 (2007)	2007	ACTA PHYS POL B	0,55670	0
420	E11 -A 12-154	DFN	**D. Bucurescu;** Physics of the N=Z and N=Z+1 nuclei in the A=80-100 region; **Acta Phys Pol B** Vol 38 (2007) Pag 1331	2007	ACTA PHYS POL B	0,55670	0
421	E11 -A 12-155	DFN	A.Burger, **M.Stanoiu**, F.Azaiez, Zs.Dombradi, A.Algora, A.Al-Khatib, B.Bastin, G.Benzoni, **R.Borcea**, Ch.Bourgeois, P.Bringel, E.Clement, J.-C.Dalouzy, Z.Dlouhy, A.Drouart, C.Engelhardt, S.Franchoo, Zs.Fulop, A.Gorgen, S.Grevy, H.Hubel, F.Ibrahim, W.Korten, J.Mrazek, A.Navin, **F.Rotaru**, P.Roussel-Chomaz, M.-G.Saint-Laurent, G.Sletten, D.Sohler, O.Sorlin, Ch.Theisen, C.Timis, D.Verney, S.Williams, Spectroscopy around 36Ca, **Acta Phys. Pol B** 38 (2007) 1353-1357	2007	ACTA PHYS POL B	0,55670	0
422	E11 -A 12-156	DFN	**Bucurescu, D**; Casten RF; Graw, G; Jolie, J; Braun, N; von Brentano, P; Faestermann, T; Heinze, S; Hertenberger, R; Lo Iudice, N; Krucken, R; Mahgoub, M; Meyer, DA; Moller, O; Mucher, D; Scholl, C; Shirikova, NY; Sun, Y; Sushkov, AV; Wirth, HF; High-resolution study of 0+ and 2+ excitations in Er-168 with the (p,t) reaction; **Phys of At Nucl** Vol 70 Issue 8 Pages 1336-1343 (2007)	2007	Phys of At Nucl	0,23835	0
423	E11 -A 12-157	DFN	McCutchan EA, Bonatsos D and **Zamfir NV**; Connecting the X(5)-beta(2), X(5)-beta(4), and X(3) models to the shape/phase transition region of the interacting boson model; **Phys At Nucl** Vol 70 Iss 8 Pag 1462-1469 (2007)	2007	Phys of At Nucl	0,23835	2

424	E11 -A 12-158	DFN	W. Królas, R. Broda, B. Fornal, R V F Janssens, A. Gadea, S. Lunardi, J. Valiente-Dobon, D. Mengoni, **N. Marginean**, et al, Coupling of the proton-hole and neutron-particle states in the neutron-rich 48K isotope, Physical Review C vol 84, Art No 064301, 2011	2011	Physical Review C	1,24767	0
425	E11 -A 12-159	DFN	M. Elvers, **S. Pascu**, et al, Investigation of octupole vibrational states in 150Nd via inelastic proton scattering (p,p′γ), Physical Review C Vol 84, 054323 (2011)	2011	Physical Review C	1,24767	0
426	E11 -A 12-16	DFN	Erhan, RV; Manoshin, S; Pepy, G; Kuklin, AI; Belushkin, AV; **Zamfir, NV**; A concept for the modernization of a SANS instrument at the IBR-2M pulsed reactor; **Nucl Instrum & Meth A** Vol 634 Pag S161-S164, 2011	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	1
427	E11 -A 12-17	DFN	Michelagnoli C.; Ur C. A.; Farnea E.; Lenzi, S; Lunardi, S; Recchia, F; **Marginean, N; Bucurescu D; Cata-Danil G; Deleanu D; Filipescu D; Ghita D; Glodariu T; Marginean R; Mihai C; Negret A; Pascu S; Sava T; Stroe L; Suliman G**; Lifetime measurement in the N = Z nucleus (44)Ti; **Acta Phys Pol B** Vol 42 Iss 3-4 Pag 825-828, 2011	2011	ACTA PHYS POL B	0,55670	0
428	E11 -A 12-18	DFN	Niikura, M; Mouginot, B; Azaiez, F; De Angelis, G; Assie, M; Bednarczyk, P; **Borcea, C**; Burger, A; Burgunder, G; Buta, A; Caceres, L; Clement, E; Coquard, L; De France, G; De Oliveira, F; Dewald, A; Dijon, A; Dombradi, Z; Fiori, E; Franchoo, S; Fransen, C; Friessner, G; Gaudefroy L; Georgiev G; Grevy, S; Hackstein M; Harakeh M.N; Ibrahim F; Kmiecik M; Lozeva R; Maj A; Matea I; **Mihai C**; Moeller O; Myalski S; **Negoita F; Pantelica D**; Perrot L; Pissula T; **Rotaru F**; Rother W; Scarpaci J. A; Stefan I; Stodel, C; Thomas, J. C; Ujic, P; Verney, D; Lifetime masurement of 2(1)(+) state in (74)Zn with differential PLUNGER technique; **Acta Phys Pol B** Vol 42 Iss 3-4 Pag 537-540, 2011	2011	ACTA PHYS POL B	0,55670	0
429	E11 -A 12-19	DFN	Blank, B., Ascher, P., Audirac, L., Canchel, G., Giovinazzo, J., Kurtukian-Nieto, T., Santos, F. de Oliveira, Grevy, S., Thomas, J. -C., **Borcea, C.**, Grigorenko, L. V; Two-proton radioactivity as a tool of nuclear structure studies, **Acta Phys Pol B** 42 (2011) 545-553	2011	ACTA PHYS POL B	0,55670	0
430	E11 -A 12-2	DFN	Sohler, D., Grevy, S., Dombradi, Zs., Sorlin, O., Gaudefroy, L., Bastin, B., Achouri, N. L., Angelique, J. C., Azaiez, F.,Ba iborodin, D.,**Borcea, R.**, Bourgeois, C., **Buta, A.**, Burger, A., Caceres, L., Chapman, R., Dalouzy, J. C., Dlouhy, Z., Drouard, A., Elekes, Z., Franchoo, S., Iacob, S., Kuti, S., Laurent, B., Lazar, M., Liang, X., Lienard, E., Lukyanov, S. M., Mrazek, J., Nalpas, L., **Negoita, F.**, Nowacki, F., Orr, N. A., Penionzkhevitch, Yu. E., Podolyak, Zs., Pougheon, F., Poves, A., Roussel-Chomaz, P., **Stanoiu, M.**, Stefan, I., St-Laurent, M. G., Spectroscopy of 39, 41Si and the border of the N=28 island of inversion, **Phys.Lett. B** 703, 417 (2011)	2011	PHYSICS LETTERS B	3,62428	62
431	E11 -A 12-20	DFN	Caceres, L, Sohler, D., Grevy, S., Force, C., Sorlin, O., Dombradi, Zs., Gaudefroy, L., Achouri, N. L., Angelique, J. C ., Azaiez, F., Bayborodin, D., Bastin, B., **Borcea, R**., Bourgeois, C., Buta, A., Burger, A., Chapman, R., Dalouzy, J. C., Dlouhy, Z., Drouard, A., Elekes, Z., Franchoo, S., Iacob, S., Laurent, B., Lazar, M., Liang, X., Lienard, E., Mrazek, J., Nalpas, L., **Negoita, F**., Orr, N. A., Penionzhkevich, Y., Podolyak, Z., Pougheon, F., Roussel-Chomaz, P., Saint-Laurent, M. G., **Stanoiu, M**., Stefan, I., Nowacki, F., Poves, A; Shells and Shapes in the (44)S nucleus, **Acta Phys Pol B** 42 (2011) 533-536	2011	ACTA PHYS POL B	0,55670	1
432	E11 -A 12-21	DFN	Plompen A; Nankov N; Rouki C; **Stanoiu M; Borcea C; Deleanu D; Negret A;** Dessagne, P; Kerveno M; Rudolf, G; Thiry, J. C; Mosconi, M; Nolte, R; Method Developing and Testing for Inelastic Scattering Measurements at the GELINA Facility; **J Kor Phys Soc** Vol 59 Iss 2 Pag 1581-1584 Part 3, 2011	2011	J. Korean Phys. Soc.	0,28408	0
433	E11 -A 12-22	DFN	Thiry, J. C; **Borcea, C**; Dessagne, P; Drohe, J. C; Jericha, E; Karam, H; Kerveno, M; Koning, A. J; **Negret, A;** Pavlik, A; Plompen, A; Rouki, C; Rudolf, G; **Stanoiu, M.**; Measurement of (n,xn gamma) Reactions of Interest for the New Nuclear Reactors; **J Kor Phys Soc** Vol 59 Iss 2 Pag 1880-1883 Part 3, 2011	2011	J. Korean Phys. Soc.	0,28408	1
434	E11 -A 12-23	DFN	**Stanoiu, M**; Nankov, N; Plompen, AJM; Rouki, C; Kozier, K; Rao, R; Roubtsov, D; Svenne, JP; Canton, L; Neutron-deuteron Elastic Scattering Measurements; **J of Kor Phys Soc** Vol 59 Iss 2 Pag 1825-1827 Part 3 2011	2011	J. Korean Phys. Soc.	0,28408	0
435	E11 -A 12-24	DFN	Hambsch, F. -J; Oberstedt, S; Al-Adil, A; **Borcea, R**; Oberstedt, A; Tudora, A; Zeynalov, Sh; Investigation of the Fission Process at IRMM; **J of Kor Phys Soc** Vol 59 Iss 2 Pag 1654-1659 Part 3 2011	2011	J. Korean Phys. Soc.	0,28408	0
436	E11 -A 12-25	DFN	Assie, M.,Santos, F. De Oliveira, De Grancey, F., Achouri, L., Alcantara-Nunez, J., Angelique, J. -C., **Borcea, C**.,Caceres, L., Celikovic, I.Chudoba, V., Pang, D. Y., Davinson, T., Ducoin, C., Fallot, M., Kiener, J., Lefebvre-Scuhl, A., Lotay, G. L.,Mrazek, J., Perrot, L., Sanchez-Benitez, A. M., **Rotaru, F**., Saint-Laurent, M. -G.,Sobolev, Yu., **Stanoiu, M**., Stanoiu, R.,Stefan, I.,Subotic, K.,Woods, P. J., Ujic, P., Wolski, R. , Spectroscopy of the unbound nucleus (18)Na, **Int J of Mod Phys E** Vol 20 (2011) 971-975	2011	International Journal of Modern Physics E	0,26099	2
437	E11 -A 12-26	DFN	C.Force, S.Grevy, L.Gaudefroy, O.Sorlin, L.Caceres, **F.Rotaru**, J.Mrazek, N.L.Achouri, J.C.Angelique, F.Azaiez, B.Bastin, **R.Borcea**, **A.Buta**, J.M.Daugas, Z.Dlouhy, Zs.Dombradi, F.De Oliveira, **F.Negoita**, Y.Penionzhkevich, M.G.Saint-Laurent, D.Sohler, **M.Stanoiu**, I.Stefan, C.Stodel, F.Nowacki, Prolate-Spherical Shape Coexistence at N=28 in 44S, **Phys.Rev.Lett.** 105, 102501 (2010)	2010	PHYSICAL REVIEW LETTERS	7,98625	3
438	E11 -A 12-27	DFN	G. Ilie, G. Neyens, G.S. Simpson, J. Jolie, A. Blazhev, H. Grawe, R.L. Lozeva, N. Vermeulen, L. Atanasova, D.L. Balabanski, F. Becker, P. Bednarczyk, C. Brandau, L. Caceres, S.K. Chamoli, J.M. Daugas, P. Doornenbal, J. Gerl, M. Gorska, J. Grebosz, M. Hass; **M. Ionescu-Bujor**; Jungclaus, A.; Kmiecik, M; Kojouharov, I; Kurz, N; Maj, A; Mallion, S; Perru, O; Pfutzner, M; Podolyak, Z; Prokopowicz, W; De Rydt, M; Saito, TR; Schaffner, H; Turzo, K; Walker, J; Werner-Malento, E; Wollersheim, HJ ; g Factor of the 7-' isomer in 126Sn and first observation of spin-alignment in relativistic fission; **Phys. Lett. B** 687, 305 (2010)	2010	PHYSICS LETTERS B	3,62428	0
439	E11 -A 12-28	DFN	L. Atanasova, D. L. Balabanski, S. K. Chamoli, M. Hass, G. S. Simpson, D. Bazzacco, F. Becker, P. Bednarczyk, G. Benzoni, N. Blasi, A. Blazhev, A. Bracco, C. Brandau, L. Caceres, F. Camera, FCL. Crespi, P.Detistov, P Doornebal, C. Fahlander, E. Farnea, G. Georgiev, J. Gerl, K. A. Gladnishki, M. Gorska, J. Grebosz, R. Hoischen, G. Ilie, **M. Ionescu-Bujor, A. Iordachescu**, A. Jungclaus, G. Lo Bianco, M. Kmiecik, I. Kojouharov, N. Kurz, S. Lakshmi, R. Lozeva, A. Maj, D. Montanari, G. Neyens, M. Pfutzner, W. Prokopowicz, Zs. Podolyak, S. Pietri, D. Rudolph, G. Rusev, T. R. Saito, A. Saltarelli, H. Schaffner, R. Schwengner, S. Tashenov, J. J. Valiente-Dobon, N. Vermeulen, J. Walker, E. Werner-Malento, O. Wieland, H. J. Wollersheim, H. Grawe and M. Hjorth-Jensen; g-factor measurements at RISING: The cases of 127Sn and 128Sn; **Europhys Lett**, Vol 91, 42001 (2010)	2010	EPL – Europhys Lett	2,99656	7

440	E11 -A 12-29	DFN	Y. Romanets, J. Bermudez, J.C. David, D. Ene, I.F. Goncalves, Y. Kadi, C. Kharoua, R. Luis, **F. Negoita**, R. Rocca, L. Tecchio, P. Vaza, EURISOL-DS multi-MW target unit: Neutronics performance and shielding assessment, dose rate and material activation calculations for the MAFF configuration, **Radiation Measurements** 45 (2010) 1350-1354	2010	Radiation Measurements	1,27714	0
441	E11 -A 12-3	DFN	D. Pérez-Loureiro, J. Benlliure, H. Álvarez-Pol, B. Blank, E. Casarejos, D. Dragosavac, V. Föhr, M. Gascón, W. Gawlikowicz, A. Heinz, K. Helariutta, A. Kelić-Heil, S. Lukić, F. Montes, L. Pieńkowski, K.-H. Schmidt, **M. Staniou**, K. Subotić, K. Sümmerer, J. Taieb and A. Trzcińska, Production of neutron-rich nuclei in fragmentation reactions of projectiles at relativistic energies, **Physics Letters B** 703 2011, 552-556	2011	PHYSICS LETTERS B	3,62428	6
442	E11 -A 12-30	DFN	Delion DS, **Zamfir NV**; Systematics of 2(1)(+) states in semimagic nuclei; **Phys Rev C** Vol 82 Iss 3 Art No 031302, 2010	2010	Physical Review C	1,24767	0
443	E11 -A 12-31	DFN	Z. M. Wang, R. Chapman, X. Liang, F. Haas, F. Azaiez, B. R. Behera, M. Burns, E. Caurier, L. Corradi, D. Curien, A. N. Deacon, Zs. Dombradi, E. Farnea, E. Fioretto, A. Gadea, A. Hodsdon, F. Ibrahim, A. Jungclaus, K. Keyes, V. Kumar, A. Latina, S. Lunardi, **N. Marginean,** G. Montagnoli, D. R. Napoli, F. Nowacki, J. Ollier, D. ODonnell, A. Papenberg, G. Pollarolo, M.-D. Salsac, F. Scarlassara, J. F. Smith, K. M. Spohr, **M. Stanoiu**, A. M. Stefanini, S. Szilner, M. Trotta, and D. Verney; Gamma-ray spectroscopy of neutron-rich 40S; **Phys Rev C** Vol 81, Iss 5, Art No 054305 (2010)	2010	Physical Review C	1,24767	10
444	E11 -A 12-32	DFN	O'Donnell D, Chapman R, Liang X, Azaiez F, Haas F, Beghini S, Behera BR, Burns M, Caurier E, Corradi L, Curien D, Deacon AN, Dombradi ZS, Farnea E, Fioretto E, Gadea A, Hodsdon A, Ibrahim F, Jungclaus A, Keyes K, Latina A, **Marginean N,** Montagnoli G, Napoli D, Nowacki F, Ollier J, Papenberg A, Pollarolo G, Salsac MD, Scarlassara F, Smith JF, Spohr KM, **Stanoiu M,** Stefanini AM, Szilner S, Trotta M, Valiente-Dobon JJ, Verney D, Wang ZM; gamma-ray spectroscopy of Cl-38(17) using grazing reactions; **Phys Rev C** Vol 81 Iss 2 Art No 024318, 2010	2010	Physical Review C	1,24767	10
445	E11 -A 12-33	DFN	Z. M. Wang, R. Chapman, X. Liang, F. Haas, M. Bouhelal, F. Azaiez, B. R. Behera, M. Burns, E. Caurier, L. Corradi, D. Curien, A. N. Deacon, Zs. Dombradi, E. Farnea, E. Fioretto, A. Gadea, A. Hodsdon, F. Ibrahim, A. Jungclaus, K. Keyes, V. Kumar, A. Latina, **N. Marginean**, G. Montagnoli, D. R. Napoli, F. Nowacki, J. Ollier, D. ODonnell, A. Papenberg, G. Pollarolo, M.-D. Salsac, F. Scarlassara, J. F. Smith, K. M. Spohr, **M. Stanoi**u, A. M. Stefanini, S. Szilner, M. Trotta, and D. Verney; Intruder negative-parity states of neutron-rich 33Si; **Phys Rev C** Vol 81, Iss 6, Art No 064301 (2010)	2010	Physical Review C	1,24767	10
446	E11 -A 12-34	DFN	G. Ilie, R.F. Casten, P. von Brentano, **D. Bucurescu**, T. Faestermann, G. Graw, S. Heinze, R. Hertenberger, J. Jolie, R. Kruecken, D.A. Meyer, D. Muecher, C. Scholl, V. Werner, R. Winkler, H.-F. Wirth; Investigation of 0+ states in 192Pt and 194Pt isotopes; **Phys Rev C** Vol 82 (2010) Art No 024303	2010	Physical Review C	1,24767	0
447	E11 -A 12-35	DFN	V. Modamio, A. Jungclaus, A. Algora, D. Bazzacco, D. Escrig, L. M. Fraile, S. Lenzi**, N. Marginean,** T. Martinez, D. R. Napoli, R. Schwengner, and C. A. Ur; New high-spin isomer and quasiparticle-vibration coupling in 187Ir; **Phys Rev C** Vol 81, Iss 5, Art No 054304 (2010)	2010	Physical Review C	1,24767	0
448	E11 -A 12-36	DFN	Broda, R, Wrzesinski J, Gadea A, **Marginean N**, Fornal B, Corradi L, Stefanini A.M, Krolas W, Pawlat T, Szpak B, Lunardi S, Valiente-Dobon J.J, Mengoni D, Farnea E, Carpenter M.P, De Angelis G, Della Vedova F, Fioretto E, Guiot B, Janssens RVF, Mantica P, Mason P, Montagnoli G, Napoli D, Orlandi R, Pokrovskiy I, Pollarolo G, Sahin E, Scarlassara F, Silvestri R, Szilner S,Ur C.A, Trotta M, Zhu S; Proton-hole states in the N=30 neutron-rich isotope K-49; **Phys Rev C** Vol 82 Iss 3 Art No 034319, 2010	2010	Physical Review C	1,24767	0
449	E11 -A 12-37	DFN	**Mihai C,** Pasternak AA, **Filipescu D, Ivascu M, Bucurescu D, Cata-Danil G, Cata-Danil I, Deleanu D, Ghita D, Glodariu T,** Lobach YN, **Marginean N, Marginean R, Negret A, Pascu S, Sava T, Stroe L, Suliman G, Zamfir NV**; Side feeding patterns and nuclear lifetime determinations by the Doppler shift attenuation method in (alpha,n gamma) reactions; **Phys Rev C** Vol 81 Iss 3 Art No 034314, 2010	2010	Physical Review C	1,24767	1
450	E11 -A 12-38	DFN	Sodestrom PA, Nyberg J, Regan PH, Algora A, de Angelis G, Ashley SF, Aydin S, Bazzacco D, Casperson RJ, Catford WN, Cederkall J, Chapman L, Corradi L, Fahlander C, Farnea E, Fioretto E, Freeman SJ, Gadea A, Gelletly W, Gottardo A, Grodner E, He CY, Jones GA, Keyes K, Labiche M, Liang X, Liu Z, Lunardi S, **Marginean N**, Mason P, Menegazzo R, Mengoni D, Montagnoli G, Napoli D, Ollier J, Pietri S, Podolyak Z, Pollarolo G, Recchia F, Sahin E, Scarlassara F, Silvestri R, Smith JF, Spohr KM, Steer SJ, Stefanini AM, Szilner S, Thompson NJ, Tveten GM, Ur CA, Valiente-Dobon JJ, Werner V, Williams SJ, Xu FR, Zhu JY; Spectroscopy of neutron-rich Dy-168,Dy-170: Yrast band evolution close to the NpNn valence maximum; **Phys Rev C** Vol 81 Iss 3 Art No 034310, 2010	2010	Physical Review C	1,24767	1
451	E11 -A 12-39	DFN	**S. Pascu, N. V. Zamfir, Gh. Cata-Danil, and N. Marginean**; Structural evolution of the Z=52-62 neutron-deficient nuclei in the interacting boson approximation framework; Phys Rev C Vol 81, Iss 5, Art No 054321, 2010	2010	Physical Review C	1,24767	0
452	E11 -A 12-4	DFN	Wang Z. M.; Chapman R.; Haas F.; Liang, X; Azaiez, F; Behera, B. R; Burns, M; Corradi, L; Curien, D; Deacon, A. N; Dombradi, Zs; Farnea, E; Fioretto, E; Gadea, A; Hodsdon, A; Ibrahim, F; Jungclaus, A; Keyes, K; Kumar, V; Latina, A; **Marginean, N**; Montagnoli, G; Napoli, D. R; Ollier, J; O'Donnell, D; Papenberg, A; Pollarolo, G; Salsac, M. -D; Scarlassara, F; Smith, J. F; Spohr, K. M; Stanoiu, M; Stefanini, A. M; Szilner, S; Trotta, M; Verney, D; Collectivity in 41S, **Phys Rev C** Vol 83 Iss 6 Article Number: 061304, 2011	2011	Physical Review C	1,24767	0
453	E11 -A 12-40	DFN	**S. Pascu, Gh. Cata-Danil, D. Bucurescu, N. Marginean, C. Muller, N. V. Zamfir**, G. Graw, A. Gollwitzer, D. Hofer, and B. D. Valnion; Structure investigation with the (p,t) reaction on 132,134Ba nuclei; Phys Rev C Vol. 81, Art.No. 014304, 2010	2010	Physical Review C	1,24767	0
454	E11 -A 12-41	DFN	P. G. Bizzeti, A. M. Bizzeti-Sona, D. Tonev, A. Giannatiempo, C. A. Ur, A. Dewald, B. Melon, C. Michelagnoli, P. Petkov, D. Bazzacco, A. Costin, G.deAngelis, F.DellaVedova, E. Farnea M. Fantuzi, C. Fransen, A. Gadea, S. Lenzi, S. Lunardi, **N. Marginean, R. Marginean**, R. Menegazzo, D. Mengoni, O. Moller, A. Nannini, D. R. Napoli, M. Nespolo, P. Pavan, A. Perego, C. M. Petrache, N. Pietralla, C. Rossi Alvarez, and P. Sona; Transition probabilities in the X(5) candidate 122Ba; **Phys Rev C** Vol 82 Iss 5 Art No 054311, 2010	2010	Physical Review C	1,24767	1

455	E11 -A 12-42	DFN	I.Mukha, K.Summerer, L.Acosta, M.A.G.Alvarez, E.Casarejos, A.Chatillon, D.Cortina-Gil, I.A.Egorova, J.M.Espino, A.Fomichev, J.E.Garcia-Ramos, H.Geissel, J.Gomez-Camacho, L.Grigorenko, J.Hofmann, O.Kiselev, A.Korsheninnikov, N.Kurz, Yu.A.Litvinov, E.Litvinova, I.Martel, C.Nociforo, W.Ott, M.Pfutzner, C.Rodriguez-Tajes, E.Roeckl, **M.Stanoiu,** N.K.Timofeyuk, H.Weick, P.J.Woods, . Spectroscopy of proton-unbound nuclei by tracking their decay products in-flight: One- and two- proton decays of 15F, 16Ne, and 19Na, **Phys.Rev. C** 82, 054315 (2010)	2010	Physical Review C	1,24767	9
456	E11 -A 12-43	DFN	J. M. Daugas, T. Faul, H. Grawe, M. Pfutzner, R. Grzywacz, M. Lewitowicz, N. L. Achouri, J. C. Angelique, D. Baiborodin, R. Bentida, R. Beraud, **C. Borcea**, C. R. Bingham, W. N. Catford, A. Emsallem, G. de France, K. L. Grzywacz, R. C. Lemmon, M. J. Lopez Jimenez, F. de Oliveira Santos, P. H. Regan, K. Rykaczewski, J. E. Sauvestre, M. Sawicka, and **M. Stanoiu,** Low-lying isomeric levels in 75Cu, **Phys. Rev. C** 81, 034304 (2010)	2010	Physical Review C	1,24767	0
457	E11 -A 12-44	DFN	**Marginean N;** Balabanski DL**; Bucurescu D,** S. Lalkovski, L. Atanasova, **G. Cata-Danil, I. Cata-Danil,** J.M. Daugas, **D. Deleanu,** P. Detistov, G. Deyanova, **D. Filipescu,** G. Georgiev, **D. Ghita,** K.A. Gladnishki, R. Lozeva**, T. Glodariu, M. Ivascu,** S. Kisyov, **C. Mihai, R. Marginean, A. Negret, S. Pascu,** D. Radulov, **T. Sava, L. Stroe, G. Suliman, and N.V. Zamfir**; In-beam measurements of sub-nanosecond nuclear lifetimes with a mixed array of HPGe and LaBr3:Ce detectors; **Eur Phys J A** Vol 46 Iss 3 Pag 329-336, 2010	2010	European Physical Journal A	1,10519	1
458	E11 -A 12-45	DFN	Rusu C, **Bucurescu D, Marginean N,** Ionescu-Bujor M, Iordachescu A, Cata-Danil G, **Cata-Danil I, Deleanu D, Filipescu D, Ghita D, Glodariu T, Ivascu M, Mihai C, Marginean R, Pascu S, Sava T, Stroe L, Suliman G, Zamfir NV**; Isomerism of low-lying states in Y-86; **Eur Phys J A** Vol 44 Iss 1 Pag 31-41, 2010	2010	European Physical Journal A	1,10519	12
459	E11 -A 12-46	DFN	M. Kmiecik, A. Maj, J. Gerl, G. Neyens, L. Atanasova, D. L. Balabanski, F .Becker, P. Bednarczyk, G. Benzoni, N. Blasi, A. Bracco, S. Brambilla, L.Caceres, F. Camera, M. Ciemala, F. C. L. Crespi, S. K. Chamoli, S. Chmel, J.M. Daugas, P. Detistov, P. Doornenbal, G. Georgiev, K. Gladnishki, M. Gorska, H. Grawe, J. Grebosz, M. Hass, R. Hoischen, G.Ilie, **M. Ionescu - Bujor,** J. Jolie, I. Kojuharov, A. Krasznahorkay, R.Kulessa, M.Lach, S.Lakshmi, S.Leoni, G.Lo Bianco, R.Lozeva, K.H.Maier, S.Mallion, K.Mazurek, W.Meczynski, B.Million, D. Montanari, S. Myalski, C. M. Petrache, M. Pfutzner, S. Pietri, Zs. Podolyak, W. Prokopowicz, D. Rudolph, N. Saito, T.R. Saito, A. Saltarelli, G. S. Simpson, J. Styczen, N. Vermeulen, E.Werner-Malento, O.Wieland, H.J. Wollersheim, M.Zieblinski; Spin alignment and g-factor measurement of the 12+ isomer in 192Pb produced in the relativistic-energy fragmentation of a 238U beam; **Eur Phys J A** Vol 45, Pag 153 (2010)	2010	European Physical Journal A	1,10519	4
460	E11 -A 12-47	DFN	**G. Suliman, D. Bucurescu,** R. Hertenberger, H.-F. Wirth, T. Faestermann, R. Kruecken, T. Behrens, V. Bildstein, K. Eppinger, C. Hinke, M. Mahgoub, P. Meierbeck, M. Reithner, S. Schwertel, N. Chauvin; Study of the 131Ba nucleus with the (pol_d,t) reaction; **Eur Phys J A** Vol 46 (2010) Pag 187-195	2010	European Physical Journal A	1,10519	16
461	E11 -A 12-48	DFN	Mazzocco, M; Boiano, A; Boiano, C; Di Pietro, A; Farinon, F; Figuera, P; **Filipescu, D**; Fortunato, L; **Glodariu, T**; Guglielmetti, A; Inglima, G; La Commara, M; Lattuada, M; Mazzocchi, C; Molini, P; Musumarra, A; Pakou, A; Parascandolo, C; Patronis, N; Pierroutsakou, D; Romoli, M; Sandoli, M; Scuderi, V; Signorini, C; Soramel, F; **Stroe, L**; Torresi, D; Vardaci, E; Vitturi, A; Scattering of (17)F nuclei from a (58)Ni target at energies around the Coulomb barrier; **Nucl. Phys A** Vol 834 Iss 1-4 Pag 488C-490C, 2010	2010	NUCLEAR PHYSICS A	1,09321	0
462	E11 -A 12-49	DFN	Mihailescu, L. C; **Borcea, C**; Baumann, P; Dessagne, Ph; Jericha, E; Karam, H; Kerveno, M; Koning, A. J; Leveque, N; Pavlik, A; Plompen, A. J. M; Quetel, C; Rudolf, G; Tresl, I; A measurement of (n, xn gamma) cross sections for Pb-208 from threshold up to 20 MeV; **Nucl Phys A** Vol 811 Iss 1-2 Pag 1-27 2008	2010	NUCLEAR PHYSICS A	1,09321	16
463	E11 -A 12-5	DFN	Kisyov S; Lalkovski S; **Marginean N; Bucurescu D**; Atanasova L; Balabanski D. L; **Cata-Danil G; Cata-Danil** I; Daugas J-M; Deleanu D; Detistov P; **Filipescu D**; Georgiev G; **Ghita D; Glodariu T**; Jolie J; Judson D. S; Lozeva R; **Marginean R; Mihai C; Negret A; Pascu S**; Radulov D; Regis J-M; **Sava T; Stroe L; Suliman G; Zamfir N. V**; Zell K. O; Zhekova M; In-beam fast-timing measurements in (103,105,107)Cd; **Phys Rev C** Vol 84 Iss 1 Art No 014324, 2011	2011	Physical Review C	1,24767	0
464	E11 -A 12-50	DFN	Blank, B; Hay, L; Huikari, J.; Leblanc, S.; List, S.; Pedroza, J-L; Ascher, P; Audirac, L; **Borcea, C**; Canchel, G; Delalee, F; Demonchy, C. E; Dossat, C; Giovinazzo, J; Hellmuth, P; Marchand, C; Matea, I; de Oliveira, R.; Pibernat, J; Rebii, A.; Serani, L; Thomas, J. C; A time projection chamber for the three-dimensional reconstruction of two-proton radioactivity events; **Nucl Instr & Meth** Vol 613 Iss 1 Pag 65-78 2010	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	1
465	E11 -A 12-51	DFN	S Lukyanov, F de Oliveira Santos, **C Borcea**, G Adamyan, M Assie, R Astabatyan, **R Borcea**, **A Buta**, L Caceres, G Georgiev, S Grevy, M N Harakeh, O Kamalou, M Lewitowicz, V Maslov, M Mocko, Yu Penionzhkevich, L Perrot, R Revenko, **F Rotaru**, M-G Saint-Laurent, **M Stanoiu**, C Stodel, J-C Thomas, B M Tsang and P Ujic, . Production of neutron-rich fragments with neutron number N > Nprojectile in the reaction 48Ca (60 MeV/nucleon) + Ta, **J. Phys. G**: Nucl. Part. Phys. 37 (2010) 105111	2010	J PHYS G NUCL PARTIC	1,00000	3
466	E11 -A 12-52	DFN	**D. Deleanu, C. Borcea,** Ph. Dessagne, M. Kerveno, **A. Negret,** A.J.M Plompen, J.C. Thiry; The gamma efficiency of the GAINS spectrometer; **Nucl Instrum & Meth A** Vol 624, Pag 130 (2010)	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	11
467	E11 -A 12-53	DFN	V.A. Morozov, N.V. Morozova, N.A. Lebedev, D.V. Filosofov, T. Badica, **Gh. Cata-Danil, D. Deleanu, D. Ghita, S. Pascu,** I.V. Popescu; Measurement of the Sr-90 absolute activity using the autocorrelation single-crystal scintillation method; **J. Radioanal Nucl Chem** Vol 284, Iss 1, Pag 221-224 (2010)	2010	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	5
468	E11 -A 12-54	DFN	Mihailescu Alexandru Dan; **Cata-Danil Gh**; Gamma-ray production in the (170)Er(p,n)(170)Tm nuclear reaction; **Centr. Eur. J of Phys** Vol 8 Iss 4 Pag 596-603, 2010	2010	Central Eur. J. Phys.	0,48339	0
469	E11 -A 12-55	DFN	Babkin, VA; **Cata-Danil, G**; Golovatyuk, VM; Molokanov, AG; Paraipan, MM; Timoshenko, GN; SOBP forming for carbon therapy; **Centr. Eur. J of Phys** Vol 8 Iss 4 Pag 683-688, 2010	2010	Central Eur. J. Phys.	0,48339	0
470	E11 -A 12-56	DFN	Dalouzy JC, Achouri L, Aliotta M, Angulo C, Benhabiles H , **Borcea C** , **Borcea R** , Bourgault P , **Buta A** , Coc A , Damman A , Davinson T , de Grancey F , Santos FD , de Sereville N , Kiener J , Pellegriti MG ,**Negoita F** , Sanchez-Benitez AM , Sorlin O , Stanoiu M , Stefan I , Woods PJ, Discovery of a New Broad Resonance in Ne-19: Implications for the Destruction of the Cosmic gamma-Ray Emitter F-18, **Phys. Rev Lett.**,102 , 162503 (2009)	2009	PHYSICAL REVIEW LETTERS	7,98625	6

471	E11 -A 12-57	DFN	Maierbeck, P; Gernhauser, R; Krucken, R; Kroll, T; Alvarez-Pol, H; Aksouh, F; Aumann, T; Behr, K; Benjamim, EA; Benlliure, J; Bildstein, V; Bohmer, M; Boretzky, K; Borge, MJG; Brunle, A; Burger, A; Caamano, M; Casarejos, E; Chatillon, A; Chulkov, LV; Cortina-Gil, D; Enders, J; Eppinger, K; Faestermann, T; Friese, J; Fabbietti, L; Gascon, M; Geissel, H; Gerl, J; Gorska, M; Hansen, PG; Jonson, B; Kanungo, R; Kiselev, O; Kojouharov, I; Klimkiewicz, A; Kurtukian, T; Kurz, N; Larsson, K; Le Bleis, T; Mahata, K; Maier, L; Nilsson, T; Nociforo, C; Nyman, G; Pascual-Izarra, C; Perea, A; Perez, D; Prochazka, A; Rodriguez-Tajes, C; Rossi, D; Schaffner, H; Schrieder, G; Schwertel, S; Simon, H; Sitar, B; **Stanoiu, M;** Summerer, K; Tengblad, O; Weick,H; Winkler, S; Brown, BA; Otsuka, T; Tostevin, J; Rae, WDM; Structure of (55)Ti from relativistic one-neutron knockout; **Phys Lett B** Vol 675 Iss 1 Pag 22-27, 2009	2009	PHYSICS LETTERS B	3,62428	0
472	E11 -A 12-58	DFN	Zs. Podolyak, P.H. Regan, A.B. Garnsworthy, S.J. Steer, M. Gorska, J.Benliure, E. Casarejos, S. Pietri, J. Gerl, H.J. Wollersheim, R. Kumar, F. Molina, A. Algora, N. Alkhomashi, G. Benzoni, A.Blazhev, P.Boutachkov, A. Bruce, L. Caceres I.J. Cullen, A.M. Denis Bacelar, P. Doornenbal, M.E. Estevez, Y. Fujita, W. Gelletly, H. Geissel, H. Grawe, J. Grelbosz, R. Hoischen, I. Kojouharov, S. Lalkovski, Z. Liu, **C. Mihai**, D. Mucher, B. Rubio, H. Schaffner, A. Tamii, S. Tashenov, J.J. Valiente-Dobon, P.M. Walker and P.J. Woods; Proton-hole excitation in the closed shell nucleus 205Au; **Phys Lett B** Vol 672 (2009), Pag 116-119	2009	PHYSICS LETTERS B	3,62428	1
473	E11 -A 12-59	DFN	D.Abriola, M.Bostan, S.Erturk, M.Fadil, M.Galan, S.Juutinen, T.Kibedi, F.Kondev, A.Luca, **A.Negret,** N.Nica, B.Pfeiffer, B.Singh, A.Sonzogni, J.Timar, J.Tuli, T.Venkova, K.Zuber, Nuclear Data Sheets for A = 84, **Nucl.Data Sheets** 110, 2815 (2009)	2009	Nuclear Data Sheets	2,13715	2
474	E11 -A 12-6	DFN	Szilner S; Corradi L; Haas F; Lebhertz D; Pollarolo G; Ur C. A; Angus L; Beghini S; Bouhelal M; Chapman R; Caurier E; Courtin S; Farnea E; Fioretto E; Gadea A; Goasduff A; Jelavic-Malenica D; Kumar V; Lunardi S; **Marginean N**; Mason P; Mengoni D; Montagnoli G; Nowacki F; Recchia F; Sahin E; Salsac M-D; Scarlassara F; Silvestri R; Smith J. F; Soic N; Stefanini A. M; Valiente-Dobon J. J; Interplay between single-particle and collective excitations in argon isotopes populated by transfer reactions; **Phys Rev C** Vol 84 Iss 1 Art No 014325, 2011	2011	Physical Review C	1,24767	0
475	E11 -A 12-60	DFN	Orlandi R; de Angelis G; Bizzeti PG; Lunardi S; Gadea A; Bizzeti-Sona AM, Bracco A, Brandolini F, Carpenter MP, Chiara CJ, Della Vedova F, Farnea E, Greene JP, Lenzi SM, Leoni S, Lister CJ, **Marginean N,** Mengoni D, Napoli DR, Singh BSN, Pechenaya OL, Recchia F, Reviol W, Sahin E, Sarantites DG, Seweryniak D, Tonev D, Ur CA, Valiente-Dobon JJ, Wadsworth R, Wiedemann KT, Zhu S; Coherent Contributions to Isospin Mixing in the Mirror Pair As-67 and Se-67; **Phys Rev Lett** Vol 103 Iss 5 Art No 052501 (2009)	2009	Physical Review C	1,24767	1
476	E11 -A 12-61	DFN	A.I. Levon, G. Graw, Y. Eisermann, R. Hertenberger, J. Jolie, N.Yu. Shirikova, A. E. Stuchbery, A. V. Sushkov, P.G. Thirolf, H.-F. Wirth, and **N.V. Zamfir**; Spectroscopy of Th-230 in the (p,t) reaction; **Phys Rev C** Vol 79, Art No 014318 (2009)	2009	Physical Review C	1,24767	0
477	E11 -A 12-62	DFN	**N. Marginean, D. Bucurescu,** C. A. Ur, **C. Mihai**, L. Corradi, E. Farnea, **D. Filipescu,** E. Fioretto, **D. Ghita,** B. Guiot, M. Gorska, **M. Ionescu-Bujor, A. Iordachescu,** D. Jelavic-Malenica, S. M. Lenzi, P. Mason, **R. Marginean**, D. Mengoni, G. Montagnoli, D. R. Napoli, **S. Pascu,** G. Pollarolo, F. Recchia, A. M. Stefanini, R. Silvestri, **T. Sava,** F. Scarlassara, S. Szilner, **N. V. Zamfir**; Evolution of deformation in the neutron-rich krypton isotopes: The 96Kr nucleus; **Phys Rev C** Vol 80 Iss 2 Art No 021301(R) (2009)	2009	Physical Review C	1,24767	0
478	E11 -A 12-63	DFN	Zhang YH, Hasegawa M, Guo WT, Liu ML, Zhou XH, de Angelis G, Axiotis TM, Gadea A, **Marginean N,** Martinez T, Napoli DR, Rusu C, Podolyak Zs, Ur C.A., Bazzacco D., Brandolini F, Lunardi S., Lenzi S. M., Menegazzo R., Schwengner R, Gargano A, von Oertzen W, Tazaki S; High-spin level structure in Mo-94,Mo-95; **Phys Rev C** Vol 79 Iss 4 Art No 044316 (2009)	2009	Physical Review C	1,24767	0
479	E11 -A 12-64	DFN	**Ionescu-Bujor M, Iordachescu A, Le**nzi SM, Napoli D. R, **Marginean N,** Medina N. H., Bazzaco D, **Bucurescu D,** deAngelis G, Della Vedova F, Farnea E, Gadea A, Menegazzo R, Lunardi S, Ur CA, Zilio S, Otsuka T, Utsuno Y; High-spin structure of Cl-37, intruder excitations, and the sd-fp shell gap; **Phys Rev C** Vol 80 Iss 3 Art No 034314 (2009)	2009	Physical Review C	1,24767	0
480	E11 -A 12-65	DFN	Modamio V, Jungclaus A, Podolyak Z, Shi Y, Xu FR, Algora A, Bazzacco D, Escrig D, Fraile LM, Lenzi S, **Marginean N,** Martinez T, Napoli DR, Schwengner R, Ur CA; Identification of yrast high-K intrinsic states in Os188; **Phys Rev C** Vol 79 Iss 2 Art No 024310 (2009)	2009	Physical Review C	1,24767	0
481	E11 -A 12-66	DFN	**Pascu S; Cata-Danil G; Bucurescu D, Marginean N, Zamfir NV,** Graw G, Gollwitzer A, Hofer D, Valnion B. D.; Investigation of the Ba-128 nucleus with the (p,t) reaction; **Phys Rev C** Vol 79 Iss 6 Art No 064323 (2009)	2009	Physical Review C	1,24767	0
482	E11 -A 12-67	DFN	R. Schwengner, G. Rainovski, H. Schnare, A. Wagner, S. Frauendorf, F. Danau, A. Jungclaus, M. Hausmann, O. Yordanov, K. P. Lieb, D. R. Napoli, G. de Angelis, M. Axiotis, **N. Marginean,** F. Brandolini, C. Rossi Alvarez; Magnetic dipole sequences in 83Rb; **Phys Rev C** Vol 80 Iss 4 Art No 044305 (2009)	2009	Physical Review C	1,24767	5
483	E11 -A 12-68	DFN	T. von Egidy, **D. Bucurescu**; Experimental energy-dependent nuclear spin distributions; **Phys Rev C** Vol 80 (2009) Art No 054310	2009	Physical Review C	1,24767	0
484	E11 -A 12-69	DFN	L. Bettermann, S. Heinze, J. Jolie, Muecher, D; Moller, O; Scholl, C; Casten, RF; Meyer, D; Graw, G; Hertenberger, R; Wirth, HF; **Bucurescu, D;** High-resolution study of 0+ states in 170Yb; **Phys Rev C** Vol 80 (2009) Art No 044333	2009	Physical Review C	1,24767	0
485	E11 -A 12-7	DFN	**Mihai C;** Pasternak A. A.; **Pascu S; Filipescu D; Ivascu M; Bucurescu D; Cata-Danil G.; Cata-Danil I; Deleanu D; Ghita D; Glodariu T; Marginean N; Marginean R; Negret A; Sava T; Stroe L; Suliman G; Zamfir N. V**; Lifetime measurements by the Doppler-shift attenuation method in the (115)Sn(alpha,n gamma)(118)Te reaction; **Phys Rev C** Vol 83 Iss 5 Art No 054310, 2011	2011	Physical Review C	1,24767	1
486	E11 -A 12-70	DFN	D. Pierroutsakou, B. Martin, C. Agodi, R. Alba, V. Baran, A. Boiano, G. Cardella, M. Colonna, R. Coniglione, E. De Filippo, A. Del Zoppo, M. Di Toro, G. Inglima, **T. Glodariu,** M. La Commara, C. Maiolino, M. Mazzocco, A. Pagano, C. Parascandolo, P. Piattelli, S. Pirrone, C. Rizzo, M. Romoli, M. Sandoli, D. Santonocito, P. Sapienza, C. Signorini; Dynamical dipole mode in fusion reactions at 16 MeV/nucleon and beam energy dependence; **Phys Rev C** Vol 80 Iss 2 Art No 024612, 2009	2009	Physical Review C	1,24767	0
487	E11 -A 12-71	DFN	L. Popescu, T. Adachi, G. P. A. Berg, P. von Brentano, D.Frekers, D.De Frenne, K.Fujita, Y. Fujita, E.-W.Grewe, M.N.Harakeh, K.Hatanaka, E.Jacobs, K.Nakanishi, **A.Negret**, Y.Sakemi, Y.Shimbara, Y.Shimizu, Y.Tameshige, A.Tamii, M.Uchida, H.J.Wortche, M.Yosoi, Gamow-Teller transitions studied in the high-resolution 64Ni(3He, t)64Cu reaction, **Phys.Rev. C** Vol 79, Art No 064312 (2009)	2009	Physical Review C	1,24767	16

488	E11 -A 12-72	DFN	N. Alkhomashi, P. H. Regan, Zs. Podolyak, S. Pietri, A.B. Garnsworthy, S.J. Steer, J. Benliure, E. Caserejos, R. F. Casten, J. Gerl, H. J. Wollersheim, J.Grebosz, G. Farrely, M.Gorska I. Kojouharov, H. Schaffner, A. Algora, G. Benzoni, A. Blazhev, P. Boutachkov, A. Bruce, A. M. Denis Bacelar, I. J. Cullen, L. Caceres, P. Doornenbal, M.E. Estevez, Y.Fujita, W. Geletly, R. Hoischen, R. Kumar, N. Kurz, S. Lalkovski, Z. Liu, **C. Mihai,** F. Molina, A. I. Morales, D. Mucher, W. Prokopowicz, B. Rubio, Y. Shi, A. Tamii, S. Tashenov, J. J. Valiente-Dobon, P. M. Walker, P. J. Woods, F. R. Xu; Beta-delayed spectroscopy of neutron-rich tantalum nuclei: Shape evolution in neutron-rich tungsten isotopes; **Phys. Rev. C** Vol 80, Art No 064308, 2009	2009	Physical Review C	1,24767	9
489	E11 -A 12-73	DFN	J. Van de Walle, F. Aksouh, T. Behrens, V. Bildstein, A. Blazhev, J. Cederkall, E. Clement, T. E. Cocolios, T. Davinson, P. Delahaye, J. Eberth, A. Ekstrom, D. V. Fedorov, V. N. Fedosseev, L. M. Fraile, S. Franchoo, R. Gernhauser, G. Georgiev, D. Habs, K. Heyde, G. Huber, M. Huyse, F. Ibrahim, O. Ivanov, J. Iwanicki, J. Jolie, O. Kester, U. Koster, T. Kroll, R. Krucken, M. Lauer, A. F. Lisetskiy, R. Lutter, B. A. Marsh, P. Mayet, O. Niedermaier, M. Pantea, R. Raabe, P. Reiter, M. Sawicka, H. Scheit, G. Schrieder, D. Schwalm, M. D. Seliverstov, T. Sieber, G. Sletten, N. Smirnova, **M. Stanoiu**, I. Stefanescu, J.-C. Thomas, J. J. Valiente-Dobon, P. Van Duppen, D. Verney, D. Voulot, N. Warr, D. Weisshaar, F. Wenander, B. H. Wolf, and M. Zielinska, Low energy Coulomb excitation of neutron-rich zinc isotopes, **Phys. Rev. C** 79, 014309 (2009)	2009	Physical Review C	1,24767	0
490	E11 -A 12-74	DFN	I. Mukha, N. K. Timofeyuk, K. Summerer, L. Acosta, M. A. G. Alvarez, E. Casarejos, A. Chatillon, D. Cortina-Gil, J. M. Espino, A. Fomichev, J. E. Garcia-Ramos, H. Geissel, J. GÃ³mez-Camacho, L. Grigorenko, J. Hofmann, O. Kiselev, A. Korsheninnikov, N. Kurz, Yu. Litvinov, I. Martel, C. Nociforo, W. Ott, M. Pfutzner, C. Rodriguez-Tajes, E. Roeckl, **M. Stanoiu**, H. Weick, and P. J. Woods, Observation of narrow states in nuclei beyond the proton drip line: 15F and 16Ne, **Phys. Rev. C** 79, 061301(R) (2009)	2009	Physical Review C	1,24767	0
491	E11 -A 12-75	DFN	M. Mahgoub, R. Kruecken, Th. Faestermann, A. Bergmaier, **D. Bucurescu**, R. Hertenberger, Th. Kroell, H.-F. Wirth, A.F. Lisetskiy; Role of cross-shell excitations in the reaction 54Fe(pol_d,p)55Fe; **Eur Phys J A** Vol 40 (2009) Pag 35-43	2009	European Physical Journal A	1,10519	33
492	E11 -A 12-76	DFN	**G. Suliman, D. Bucurescu,** C. Rusu, R. Hertenberger, H. -F. Wirth, T. Faestermann, R. Krucken, K. Wimmer, T. Behrens, V. Bildstein, K. Eppinger, C.Hinke, M.Mahgoub, P. Meierbeck M. Reithner, S. Schwertel and N. Chauvin; Study of the 133Ba nucleus with the (pol_d,p) reaction; **Eur Phys J A** Vol 41 (2009) Pag 299	2009	European Physical Journal A	1,10519	4
493	E11 -A 12-77	DFN	Panteleev, VN; Alyakrinskiy, O; Barbui, M; Barzakh, AE; Fedorov, DV; Ivanov, VS; Lhersonneau, G; Mezilev, KA; Molkanov, PL; Moroz, FV; Orlov, SY; **Stroe, L**; Tecchio, LB; Tonezzer, M; Volkov, YM; Production of Cs and Fr isotopes from a high-density UC targets with different grain dimensions; **Eur Phys J A** Vol 42 Iss 3 Pag 495-501; 2009	2009	European Physical Journal A	1,10519	6
494	E11 -A 12-78	DFN	Rusu C, Ur CA, **Bucurescu D, Iordachescu A, Marginean N, Cata-Danil G, Cata-Danil I, Ionescu-Bujor M, Ivascu M,** Bazzacco D, Kroll T, Lenzi S, Lunardi S, Menegazzo R, Alvarez CR, de Angelis G, Gadea A, Napoli D; In-beam gamma-ray spectroscopy and shell-model description of Y-85,Y-86 isotopes; **Nucl Phys A** Vol 818 Iss 1-2 Pag 1-35 (2009)	2009	NUCLEAR PHYSICS A	1,09321	6
495	E11 -A 12-79	DFN	L. Bardelli, M. Bini, G. Casini, G. Pasquali, G. Poggi, S. Barlini, A. Becla, R. Berjillos, B. Borderie, R. Bougault, M. Bruno, M. Cinausero, M. D'Agostino, J. De Sanctis, J.A. Duenas, P. Edelbruck, E. Geraci, F. Gramegna, A. Kordyasz, T. Kozik, V.L. Kravchuk, L. Lavergne, P. Marini, A. Nannini, **F. Negoita**, A. Olmi, A. Ordine, S. Piantelli, E. Rauly, M.F. Rivet, E. Rosato, C. Scian, A.A. Stefanini, G. Vannini, S. Velica, M. Vigilante, Influence of crystal-orientation effects on pulse-shape-based identification of heavy-ions stopped in silicon detectors; **Nucl. Instrum. Meth. A** 605 (2009) 353-358	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	25
496	E11 -A 12-8	DFN	Corradi L.; Szilner S.; Pollarolo G.; Colo, G.; Mason, P; Farnea, E; Fioretto, E; Gadea, A; Haas, F; Jelavic-Malenica, D; **Marginean, N**; Michelagnoli, C; Montagnoli, G; Montanari, D; Scarlassara, F; Soic, N; Stefanini, A. M; Ur, C. A; Valiente-Dobon, J. J.; Single and pair neutron transfers at sub-barrier energies; **Phys Rev C** Vol 84 Iss 3 Art No 034603, 2011	2011	Physical Review C	1,24767	0
497	E11 -A 12-80	DFN	Recchia, F; Bazzacco, D; Farnea, E; Venturelli, R; Aydin, S; **Suliman, G**; Ur, CA; Performance of an AGATA prototype detector estimated by Compton-imaging techniques; **Nucl Instrum & Meth A** Vol 604 Iss 1-2 Pag 60-63 2009	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	14
498	E11 -A 12-81	DFN	A.I. Morales, J. Benliure, P.Regan, Z.Podolyak, M. Gorska, N. Alkhomashi, S. Pietri, R. Kumar, E.Casarejos, J.Agramunt, A.Algora, H. Alvarez- Pol, G. Benzoni, A. Blazhev, P. Boutachkov, A.M. Bruce, L.S. Caceres, I.J. Cullen, A.M. Denis Bacelar, P. Doornenbal, D. Dragosavac, M.E. Estvez, G. Farrelly, Y. Fujita, A.B Garnsworthy, W. Gelletly, J. Gerl, J. Grobosz, R. Hoischen, I. Kojouharov, N. Kurz, S. Lalkovski, Z. Liu, D. Parez-Loureiro, W. Prokopowicz, **C. Mihai**, F. Molina, D. Mucher, B. Rubio, H. Schaffner, S.J. Steer, A.Tami, S.Tashenov, JJ. Valiente Dobo S. Verma, P.M. Walker, H.J. Wollersheim, P.J. Woods; beta-delayed gamma-ray spectroscopy of heavy neutron rich nuclei "south" of lead; **Acta Phys Pol B** Vol 40, Pag 867 (2009)	2009	ACTA PHYS POL B	0,55670	0
499	E11 -A 12-82	DFN	N. Alkhomashi, P.H. Regan, Zs. Podolyak, S.B. Pietri, A.B. Garnsworthy, S.J. Steer, J. Benliure, E. Caserejos, M. Gorska, J. Gerl, H.J. Woller-sheim, J. Grebosz, N. Kurz, I. Kojouharov, H. Schaffner, A. Algora, G. Benzoni, A. Blazhev, P. Boutachkov, A.M. Bruce, L. Caceres, P. Doornenbal, A.M. Denis Bacelar, I.J. Cullen, M.E. Estevez, G. Farrelly, Y. Fujita, W. Gelletly, R. Hoischen, R. Kumar, S. Lalkovski, Z. Liu, **C. Mihai**, F. Molina, D. Mucher, B. Rubio, A. Tamii, S. Tashenov, J.J. Valiente-Dobon, P.M. Walker, P.J. Woods; beta --Delayed and Isomer Spectroscopy of Neutron-Rich Ta and W Isotopes; **Acta Phys Pol B** Vol 40, Pag 875 (2009)	2009	ACTA PHYS POL B	0,55670	0
500	E11 -A 12-83	DFN	L.Corradi, S.Szilner, G.Pollarolo, S.Beghini, E. Fioretto, B.Guiot, **N.M.Marginean,** P.Mason, G.Montagnoli, F.Scarlassara, R.Silvestri, A.M. Stefanini, E. Farnea, C. A. Ur, S. Aydin, G.de Angelis, A. Gadea, R. Orlandi, S. Lunardi, **R. Marginean,** D.Mengoni, D.R.Napoli, **C.Mihai,** F.Recchia, E.Sahin, N.Soic, D.Jelavic, J.J. Valiente-Dobon, F.Della Vedova; Heavy Ion Transfer Reactions Studied with PRISMA+ CLARA; **Acta Phys Pol B** Vol 40, Pag 457 (2009)	2009	ACTA PHYS POL B	0,55670	0
501	E11 -A 12-84	DFN	**Zamfir NV, Bucurescu D, Cata-Danil G, Ivascu A, Marginean N**; Correlations of energy ratios for collective nuclear bands; **Acta Phys Pol B** Vol 40 Iss 3 Pag 503-511 (2009)	2009	ACTA PHYS POL B	0,55670	0

502	E11 -A 12-85	DFN	Mason P, Corradi L, Fioretto E, Guiot B, Silvestri R, Stefanini AM, Beghini S, Montagnoli G, Scarlassara F, **Marginean N,** Szilner S, Pollarolo G, Farnea E, Gadea A, Mengoni D, Napoli DR, Recchia F, Sahin E, Ur CA, Valiente-Dobon JJ, Chapman R, Freeman S, Hodsdon A, Jones G, Labiche M, O'Donnell D, Ollier J, Orlandi R, Smith J, Spohr K, Thompson N, Wady P, Wang Z; Exploring the performance of the spectrometer PRISMA in heavy Zirconium and Xenon mass regions; **Acta Phys Pol B** Vol 40 Iss 3 Pag 489-492 (2009)	2009	ACTA PHYS POL B	0,55670	0
503	E11 -A 12-86	DFN	S. Franchoo, N.L. Achouri, A. Algora, A. Al-Khatib, J.C. Angelique, F. Azaiez, D. Baiborodin, B. Bastin, D. Beaumel, M. Belleguic, G. Benzoni, Y. Blumenfeld, **C. Borcea**, **R. Borcea**, C. Bourgeois, P. Bringel, B.A. Brown, A. Burger, **A. Buta**, R. Chapman, E. Clement, J.C. Dalouzy, Z. Dlouhy, Z. Dombradi, A. Drouart, Z. Elekes, C. Engelhardt, S. Fortier, Z. Fulop, L. Gaudefroy, M. Gelin, J. Gibelin , A. Gorgen, S. Grevy, D. Guillemaud-Mueller, F. Hammache, H. Hubel, S. Iacob, F. Ibrahim, K. Kemper, A. Kerek, W. Korten, A. Krasznahorkay, K.L. Kratz, B. Laurent, M. Lazar, D. Lebhertz, M. Lewitowiczk, X. Liang, E. Lienard, S. Lukyanov, S. Mandal, C. Monrozeau, J. Mrazek, L. Nalpas, A. Navin, **F. Negoita**, F. Nowacki, N. Orr, A. Ostrowski, T. Otsuka, D. Pantelica, Y., Penionzhkevich, J. Piekarewicz, Z. Podolyak, E. Pollacco, F. Pougheon, A. Poves, F. Rotaru, P. Roussel-Chomaz, E. Rich, J.A. Scarpaci, M.G. Saint-Laurent, H. Savajols, G. Sletten, D. Sohler, O. Sorlin, **M. Stanoiu**, I. Stefan, T. Suzuki, C. Theisen, J. Timar, C. Timis, E. Tryggestad, D. Verney, S. Williams, A. Yamamoto, Recent results from GANIL, **Acta Phys. Pol. B**40 (2009) 419-425	2009	ACTA PHYS POL B	0,55670	0
504	E11 -A 12-87	DFN	D.De Frenne, **A.Negret**, Nuclear Data Sheets for A = 106, **Nucl.Data Sheets** 109, 943 (2008)	2008	Nuclear Data Sheets	2,13715	4
505	E11 -A 12-88	DFN	A. M. Stefanini, G. Montagnoli, R.Silvestri, S.Beghini, L.Corradi, S.Courtin, E.Fioretto, B.Guiot, F.Haas, D.Lebhertz, **N.Marginean,** P.Mason, E.Scarlassara, R.R.Sagaidak and S. Szilner; Fusion of the positive Q-value system 36S+48Ca well below the Coulomb barrier; **Phys Rev C**, Vol 78, Iss 4, Art No 044607 (2008)	2008	Physical Review C	1,24767	0
506	E11 -A 12-89	DFN	A. Jungclaus, V. Modamio, J .L. Egido, R. Schwenger, A.Algora, D.Bazzacco, D.Escrig, M. A. Fernandez, L. M. Fraile, S. Lenzi, N**. Marginean,** T.Martinez, D.R.Napoli, C.A.Ur; Revised and extended level scheme of the doubly-odd nucleus 188Ir; **Phys Rev C** Vol 77, Art No 024310 (2008)	2008	Physical Review C	1,24767	0
507	E11 -A 12-9	DFN	Medina N. H; Oliveira J. R. B; Brandolini F; Ribas R. V; Della Vedova F; Farnea E; Gadea A; Lenzi S.M**; Marginean N;** Martinez T; Napoli D. R; Nespolo M; Pavan P; Ur C. A.; Structure of (46)Ti at low excitation energy; **Phys Rev C** Vol 84 Iss 2 Art No 024315, 2011	2011	Physical Review C	1,24767	2
508	E11 -A 12-90	DFN	J. J. Valiente-Dobon, S.M. Lenzi, S.J. Freeman, S .Lunardi, J. F. Smith, A. Gottardo, F. Della Vedova, E. Farnea, A. Gadea, D. R. Napoli, M. Axiotis, S.Aydin, D.Bazzacco, P.G. Bizzeti, A.M. Bizzeti, G. Benzon, **D. Bucurescu,** L. Corradi, A. N. Deacon, G. de Angelis, E. Fioretto, B. Guiot, **M.Ionescu-Bujor, A. Iordachescu**, S. Leoni, **N.Marginean, R.Marginean,** P.Mason, R. Menegazzo, D. Mengoni, B. Million, G. Montagnoli, R.Orlandi, F. Recchia, E. Sahin, F. Scarlassara, R. P.Singh, A. M. Stefanini, D. Steppenbeck, S.Szilner, C.A.Ur, B.J.Varley, O Wieland; Spectroscopy of neutron-rich 59-63Mn isotopes; **Phys Rev C**, Vol 78, Iss 2, Art No 024302 (2008)	2008	Physical Review C	1,24767	4
509	E11 -A 12-91	DFN	**D. Bucurescu, N. V. Zamfir, G. Cata-Danil, M. Ivascu, and N. Marginean,** Universality of Mallmann correlations for nuclear band structures; **Phys Rev C**, Vol 78, Iss 4, Art No 044322 (2008)	2008	Physical Review C	1,24767	1
510	E11 -A 12-92	DFN	B. Fornal, R. V. F.Janssens, R. Broda, **N. Marginean,** S. Beghini, L. Corradi, M. P. Carpenter, G. de Angelis, F. Della Vedova, E.Farnea, E.Fioretto, A.Gadea, B.Guiot, M.Honma, W.Krolas, T.Lauritsen, S.Lunardi, P.F.Mantica, P.Mason, G.Montagnoli, D.R. Napoli, T.Otsuka, T.Pawlat, G.Pollarolo, F.Scarlassara, A.M.Stefanini, D.Seweryniak, S.Szilner, C.A.Ur, M.Trotta, J.J.Valiente-Dobon, J.Wrezsinski, S.Zhu; Yrast structure of the neutron-rich N=31 isotones 51Ca and 52Sc; **Phys Rev C** Vol 77, Art No 014304 (2008)	2008	Physical Review C	1,24767	0
511	E11 -A 12-93	DFN	T. von Egidy, **D. Bucurescu**; Spin distribution in low-energy level schemes; **Phys Rev C** Vol 78 (2008) Art No 051301(R) (5 pages)	2008	Physical Review C	1,24767	0
512	E11 -A 12-94	DFN	R.L.Lozeva, G.S.Simpson, H.Grawe, G.Neyens, L.A.Atanasova, D.L.Balabanski, D.Bazzacco, F. Becker, P. Bednarczyk, G. Benzoni, N. Blasi, A. Blazhev, A. Bracco, C. Brandau, L. Caceres, F. Camera, S. K. Chamoli, F. C. L. Crespi, J.-M. Daugas, P.Detistov, M.De Rydt, P.Doornenbal, C.Fahlander, E.Farnea, G.Georgiev, J.Gerl, K.A. Gladnishki, M.Gorska, J.Grebosz, M.Hass, R. Hoischen, G. Ilie, **M. Ionescu - Bujor, A. Iordachescu,** J.Jolie, A.Jungclaus, M.Kmiecik, I. Kojouharov, N. Kurz, S. P. Lakshmi, G. Lo Bianco, S.Mallion, A.Maj, D.Montanari, O.Perru, M.Pfutzner, S.Pietri, J.A.Pinston, Zs.Podolyak, W. Prokopowicz, D. Rudolph, G. Rusev, T.R. Saitoh, A. Saltarelli, H. Schaffner, R. Schwen-gner, S.Tashenov, K.Turzo, J.J. Valiente -Dobon, N.Vermeulen, J.Walker, E.Werner, O.Wieland, HJ. Wollersheim, New sub-μs isomers in 125, 127, 129Sn and isomer systematics of 124-130S; **Phys.Rev. C** Vol 77, Iss 6, Art No 064313 (2008)	2008	Physical Review C	1,24767	0
513	E11 -A 12-95	DFN	D. L. Smith, H. Mach, H. Penttila, H. Bradley, J. Aysto, V.-V. Elomaa, T. Eronen, **D. G. Ghita**, J. Hakala, M. Hauth, A. Jokinen, P. Karvonen, T. Kessler, W. Kurcewicz, H. Lehmann, I. D. Moore, J. Nyberg, S. Rahaman, J. Rissanen, J. Ronkainen, P. Ronkanen, A. Saastamoinen, T. Sonoda, O. Steczkiewicz, and C. Weber; Lifetime measurements of the negative-parity 7- and 8- states in Cd-122; **Phys Rev C** Vol 77, Iss 1, Art No 014309 (2008)	2008	Physical Review C	1,24767	2
514	E11 -A 12-96	DFN	L.Gaudefroy, O.Sorlin, F.Nowacki, D.Beaumel, Y.Blumenfeld, Z.Dombradi, S.Fortier, S.Franchoo, S.Grevy, F.Hammache, K.W.Kemper, K.L.Kratz, M.G.St.Laurent, S.M.Lukyanov, L.Nalpas, A.N.Ostrowski, Yu.-E.Penionzhkevich, E.C.Pollacco, P.Roussel, P.Roussel-Chomaz, D.Sohler, **M.Stanoiu,** E.Tryggestad, Structure of the N = 27 isotones derived from the 44Ar(d, p)45Ar reaction, **Phys.Rev. C** 78, 034307 (2008)	2008	Physical Review C	1,24767	0
515	E11 -A 12-97	DFN	D.Sohler, **M.Stanoiu,** Zs.Dombradi, F.Azaiez, B.A.Brown, M.G.Saint-Laurent, O.Sorlin, Yu.-E.Penionzhkevich, N.L.Achouri, J.C.Angelique, M.Belleguic, **C.Borcea,** C.Bourgeois, J.M.Daugas, F.De Oliveira-Santos, Z.Dlouhy, C.Donzaud, J.Duprat, Z.Elekes, S.Grevy, D.Guillemaud-Mueller, F.Ibrahim, S.Leenhardt, M.Lewitowicz, M.J.Lopez-Jimenez, S.M.Lukyanov, W.Mittig, J.Mrazek, **F.Negoita,** Zs.Podolyak, M.G.Porquet, F.Pougheon, P.Roussel-Chomaz, H.Savajols, G.Sletten, Y.Sobolev, C.Stodel, J.Timar, . In-beam gamma-ray spectroscopy of the neutron-rich nitrogen isotopes 19-22N, **Phys.Rev. C** 77, 044303 (2008)	2008	Physical Review C	1,24767	0
516	E11 -A 12-98	DFN	M.G.Pellegriti, F.Hammache, P.Roussel, L.Audouin, D.Beaumel, P.Descouvemont, S.Fortier, L.Gaudefroy, J.Kiener, A.Lefebvre-Schuhl, **M.Stanoiu**, V.Tatischeff, M.Vilmay, Indirect study of the 13C(gamma, n)16O reaction via the 13C(7Li, t)17O transfer reaction, **Phys.Rev. C** 77,	2008	Physical Review C	1,24767	0

517	E11 -A 12-99	DFN	I.Mukha, L.Grigorenko, K.Summerer, L.Acosta, M.A.G.Alvarez, E.Casarejos, A.Chatillon, D.Cortina-Gil, J.M.Espino, A.Fomichev, J.E.Garcia-Ramos, H.Geissel, J.Gomez-Camacho, J.Hofmann, O.Kiselev, A.Korsheninnikov, N.Kurz, Yu.Litvinov, I.Martel, C.Nociforo, W.Ott, M.Pfutzner, C.Rodriguez-Tajes, E.Roeckl, **M.Stanoiu,** H.Weick, P.J.Woods, Proton-proton correlations observed in two-proton decay of 19Mg and 16Ne, **Phys.Rev. C** 77, 061303 (2008)	2008	Physical Review C	1,24767	0
518	E11 -A 15-30	DFN	**M. Balasoiu**, **E. M. Anitas**, I. Bica, **R.V. Erhan**, V. A. Osipov, O. L. Orelovich, D. Savu, S. Savu, A. I. Kuklin, SANS of interacting magnetic micro-sized Fe particles in a Stomaflex creme polymer matrix, **Optoelectronics and Advanced Materials - Rapid Comunications** , ISSN:1842-657, 2, 11, 730 - 734, 2008.	2008	J OPTOELECTRON ADV M	0,32990	0
519	E11 -A 15-31	DFN	L. Ion, V.A. Antohe, M. Ghenescu, O. Ghenescu , R. Bazavan, M. Danila, **M.M. Gugiu**, S. Antohe , The effect of ionizing radiations on the structural, electrical and optical properties of AIIBVI polycrystalline thin films used as solar cell materials, **Solid-State Ionics,** 1012-Y12-01, 2007.	2007	Solid-State Ionics	1,58829	2
520	E11 -A 15-32	DFN	M. Petrascu, A. Constantinescu, I. Cruceru, M. Duma, M. Giurgiu, A. Isbasescu, **H. Petrascu**, S. Serban, V. Stoica, I. Tanihata, W. G. Lynch, C. Bordeanu, M. A. Famiano, K. Ieki, Experimental state of n-n correlation function for Borromean halo nuclei investigation, **Nuclear Physics A**, 790, 235C-240C, 2007.	2007	NUCLEAR PHYSICS A	1,09321	6
521	E11 -A 15-33	DFN	D.Bica, L.Vekas, M.V.Avdeev, O.Marinica, V.Socoliuc, **M.Balasoiu**, V.M.Garamus, Sterically stabilized water based magnetic fluids: Synthesis, structure and properties, **Journal of Magnetism and Magnetic Materials**, 311, 17-21, 2007.	2007	Journal of Magnetism and Magnetic Materials	0,91	0
522	E11 -A 15-34	DFN	M.V.Avdeev, D.Bica, L.Vekas, O.Marinica, **M.Balasoiu**, V.L.Aksenov, L.Rosta, V.M.Garamus, A.Schreyer ,On the possibility of using short chain length mono-carboxylic acids for stabilization of magnetic fluids, **Journal of Magnetism and Magnetic Materials**, 311, 6-9, 2007.	2007	Journal of Magnetism and Magnetic Materials	0,91	17
523	E11 -A 15-4	DFN	A.Yu.Cherny, **E.M.Anitas**, A.I.Kuklin, V.A.Osipov, Deterministic fractals: Extracting additional information from small-angle scattering data, **Phys. Rev. E** 84, 036203, 2011.	2011	PHYSICAL REVIEW E	1,41582	1
524	E11 -A 15-5	DFN	**Bogdan Mitrica, Romul Margineanu,** Sabin Stoica, **Mirel Petcu, Iliana Brancus**, Alexandru Jipa, Ionel Lazanu, Octavian Sima, Andreas Haungs, Heinigerd Rebel, **Marian Petre, Gabriel Toma, Alexandra Saftoiu, Denis Stanca**, **Ana Apostu**, Claudia Gomoiu**,** A mobile detector for measurements of the atmospheric muon flux in underground sites**, Nuclear Instruments and Methods in Physics Research A** 654, 176–	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
525	E11 -A 15-6	DFN	**R.V. Erhan**, S. Manoshin, G. Pepy, A.I. Kuklin, A.V. Belushkin and **N.V. Zamfir**, A concept for the modernization of a SANS instrument at the IBR-2M pulsed reactor, **Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment**, 634, 1, Supplement, S161-S1641, 2011.	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
526	E11 -A 15-7	DFN	**M. Balasoiu**, I. Bica, Yu.L. Raikher, E.B. Dokukin, L. Almasy, B. Vatzulik, A.I. Kuklin, Particle Concentration Effects on the Ferrofluids based Elastomers Microstructure, **Optoelectronics and Advanced Materials – Rapid Communications**, 5, 5, 523-526 2011.	2011	J OPTOELECTRON ADV M	0,32990	0
527	E11 -A 15-8	DFN	Gorelova S. V., Frontasyeva M. V., Yurukova L., M. Coşkun, **A. Pantelica**, C.J. Saitanis, M. Tomašević, M. Aničić, Revitalization of urban ecosystems through vascular plants: preliminary results from the BSEC-PDF project, **Agrochimica,** 55 (2) 65-84, 2011.	2011	Agrochimica	0,21701	0
528	E11 -A 15-9	DFN	A.Yu.Cherny, **E.M.Anitas**, A.I.Kuklin, **M.Balasoiu,** V.A.Osipov, Scattering from generalized Cantor fractals, **Journal of Applied Crystalography** 43, 790-797, 2010.	2010	Journal of Applied Crystalography	5,11170	2
529	E12 -A 13-1	DFN	**Knee-like structure in the spectrum of the heavy component of cosmic rays observed with KASCADE-Grande** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, I, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, P. Luczak, H.J. Mathes, H.J. Mayer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer and J. Zabierowski, **Phys. Rev. Lett**. 107 (2011) 171104	2011	PHYSICAL REVIEW LETTERS	7,98625	0
530	E12 -A 13-10	DFN	**On noise treatment in radio measurements of cosmic ray air showers** A. Haungs, W.D. Apel, J.C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. BÃ¤hren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, P. Åuczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, J.A. Zensus, **Nucl. Instr. and Meth. A**, (in press), doi:10.1016/j.nima.2010.11.009	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	0
531	E12 -A 13-11	DFN	**The KASCADE-Grande experiment** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, I, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, P. Luczak, H.J. Mathes, H.J. Mayer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer and J. Zabierowski, **Nucl. Instr. and Meth. A** 620 (2010) 202-216	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	0

532	E12 -A 13-12	DFN	**The LOPES experiment - Recent results, status and perspectives** A. Haungs, W.D. Apel, J.C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. BÃ¤hren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, P. Åuczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, J.A. Zensus, **Nucl. Instr. and Meth. A**, doi:10.1016/j.nima.2010.11.081	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	8
533	E12 -A 13-13	DFN	**A test of the hadronic interaction model EPOS with air shower data** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni,, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro,, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, D. Hildebrand, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, Y. Kolotaev, P. Luczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, **J. Phys.G**: Nucl.Part.Phys. 36 (2009) 035201	2009	J PHYS G NUCL PARTIC	1,00000	2
534	E12 -A 13-14	DFN	**Air shower measurements with the LOPES radio antenna array** A. Haungs, W.D. Apel, J.C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. Bahren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, P. Åuczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, J.A. Zensus, **Nucl.Instr. and Meth. A** 604 (2009) 1-8	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	0
535	E12 -A 13-15	DFN	**Analysis of inclined showers measured with LOPES** A. Haungs, W.D. Apel, J.C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. Bahren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, P. Åuczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, J.A. Zensus, **Nucl.Instr. and Meth. A** 604 (2009) S9	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	13
536	E12 -A 13-16	DFN	**Energy spectra of elemental groups of cosmic rays: Update on the KASCADE unfolding analysis** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, D. Hildebrand, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, Y. Kolotaev, P. Luczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica,** C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, **Astroparticle Physics** 31 (2009) 86-91	2009	Astroparticle Physics	1,70120	35
537	E12 -A 13-17	DFN	**New method to measure the attenuation of hadrons in extensive air showers** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, D. Hildebrand, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, Y. Kolotaev, P. Luczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, **Phys. Rev. D** 80, 022002 (2009)	2009	Phys Rev D	1,67198	0
538	E12 -A 13-18	DFN	**Radio emission of energetic cosmic ray air showers: Polarization measurements with LOPES** A. Haungs, W.D. Apel, J.C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. Bahren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, P. Åuczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, J.A. Zensus, **Nucl.Instr. and Meth. A** 604 (2009) S81	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	3

539	E12 -A 13-19	DFN	**The Extensive Air Shower Experiment KASCADE-Grande** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni,, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, D. Hildebrand, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, Y. Kolotaev, P. Luczak, H.J. Mathes, H.J. Mayer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski, **Modern Physics Letters A** (2009) in press	2009	Modern Physics Letters A	0,55713	0
540	E12 -A 13-2	DFN	**Investigation of the properties of galactic cosmic rays with the KASCADE-Grande experiment** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, I, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, P. Luczak, H.J. Mathes, H.J. Mayer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer and J. Zabierowski, **Nucl. Instr. and Meth. A** 630 (2011) 222-225	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
541	E12 -A 13-20	DFN	**Applying shower development universality to KASCADE data** W.D. Apel, A.F. Badea, K. Bekk, J. Blumer, E. Boos, H. Bozdog, I.M. Brancus, K. Daumiller, P. Doll, R. Engel, J. Engler, H.J. Gils, R. Glasstetter, A. Haungs, D. Heck, J.R. Horandel, K.-H. Kampert, H.O. Klages, I. Lebedev, H.J. Mathes, H.J. Mayer, J. Milke, J. Oehlschlager, S. Ostapchenko, M. Petcu, H. Rebel, M. Roth, G. Schatz, H. Schieler, H. Ulrich, J. van Buren, A. Weindl, J. Wochele, J. Zabierowski **Astroparticle Physics**, vol. 29, p. 412-419 (2008)	2008	Astroparticle Physics	1,70120	33
542	E12 -A 13-21	DFN	**Direction identification in radio images of cosmic-ray air showers detected with LOPES and KASCADE** A. Nigl, W. D. Apel, J. C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. Bahren, K. Bekk, M. Bertaina, P. L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Braggemann, P. Buchholz, S. Buitink, H. Butcher, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, H. Gemmeke, P. L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J. R. Horandel, A. Horneffer, T. Huege, P. G. Isar, K.-H. Kampert, D. Kickelbick, Y. Kolotaev, O. Kramer, J. Kuijpers, S. Lafebre, P. Åuczak, M. Manewald, H. J.Mathes, H. J. Mayer, C.Meurer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenk, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W.Walkowiak, A. Weindl, J. Wochele, J. Zabierowski, and J. A. Zensus, **Astronomy & Astrophysics**, 487, (2008), 781-788	2008	Astronomy & Astrophysics	1,78619	0
543	E12 -A 13-22	DFN	**Frequency spectra of cosmic ray air shower radio emission measured with LOPES** W. D. Apel, J. C. Arteaga, T. Asch, J. Auffenberg, F. Badea, L. Bahren, K. Bekk, M. Bertaina, P. L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Braggemann, P. Buchholz, S. Buitink, H. Butcher, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, H. Gemmeke, P. L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J. R. Horandel, A. Horneffer, T. Huege, P. G. Isar, K.-H. Kampert, D. Kickelbick, Y. Kolotaev, O. Kramer, J. Kuijpers, S. Lafebre, P. Åuczak, M. Manewald, H. J.Mathes, H. J. Mayer, C.Meurer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Ostapchenk, S. Over, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F. Schroder, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W.Walkowiak, A. Weindl, J. Wochele, J. Zabierowski, and J. A. Zensus, **Astronomy & Astrophysics** 488, 807-817 (2008)	2008	Astronomy & Astrophysics	1,78619	2
544	E12 -A 13-23	DFN	**KASCADE-Grande: An overview and first results** M. Bertaina, W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kickelbick, H.O. Klages, Y. Kolotaev, P. Luczak, H.J. Mathes, H.J. Mayer, C. Meurer, J. Milke, **B. Mitrica**, A. Morales, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, T. Pierog, S. Plewnia, H. Rebel, M. Roth, H. Schieler, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, J. Zabierowski, **Nucl.Instr. and Meth. A**, vol. 588, p. 162-165 (2008)	2008	NUCL INSTR & METH IN PHYS RES A	1,02286	19
545	E12 -A 13-24	DFN	**Time structure of the EAS electron and muon components measured by the KASCADE-Grande experiment** W.D. Apel, J.C. Arteaga, A.F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A.	2008	Astroparticle Physics	1,70120	36
546	E12 -A 13-25	DFN	**Amplified radio emission from cosmic ray air showers in thunderstorms** W.D. Apel, T. Asch, A.F. Badea, L. Bahren, K. Bekk, A. Bercuci, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, S. Buitink, M. Bruggemann, P. Buchholz, H. Butcher, A. Chiavassa, F. Cossavella, K. Daumiller, F. Di Pierro, P. Doll, R. Engel, H. Falcke, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, K.H. Kampert, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, H.J. Mathes, H.J. Mayer, C. Meurer, J. Milke, **B. Mitrica,** C. Morello, G. Navarra, S. Nehls, A. Nigl, R. Obenland, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, J. Petrovic, T. Pierog, S. Plewnia, H. Rebel, A. Risse, M. Roth, H. Schieler, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, J. Zabierowski, J.A. Zensus, D. Zimmermann, **Astronomy & Astrophysics** 467, 385-394, 2007	2007	Astronomy & Astrophysics	1,78619	0

547	E12 -A 13-26	DFN	**Radio emission of highly inclined cosmic ray air showers measured with LOPES** W.D. Apel, T. Asch, A.F. Badea, L. Bahren, K. Bekk, A. Bercuci, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, S. Buitink, M. Bruggemann, P. Buchholz, H. Butcher, A. Chiavassa, F. Cossavella, K. Daumiller, F. Di Pierro, P. Doll, R. Engel, H. Falcke, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, K.H. Kampert, Y. Kolotaev, O. Kromer, J. Kuijpers, S. Lafebre, H.J. Mathes, H.J. Mayer, C. Meurer, J. Milke, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, R. Obenland, J. Oehlschlager, S. Ostapchenko, S. Over, **M. Petcu**, J. Petrovic, T. Pierog, S. Plewnia, H. Rebel, A. Risse, M. Roth, H. Schieler, O. Sima, K. Singh, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, J. van Buren, W. Walkowiak, A. Weindl, J. Wochele, J. Zabierowski, J.A. Zensus, D. Zimmermann, **Astronomy & Astrophysics**, 462, 389-395, 2007	2007	Astronomy & Astrophysics	1,78619	0
548	E12 -A 13-27	DFN	**Test of interaction models up to 40 PeV by studying hadronic** W D Apel, A F Badea, K Bekk, J Blumer, H Bozdog, **I M Brancus**, K Daumiller, P Doll, R Engel, J Engler, H J Gils, R Glasstetter, A Haungs, D Heck, J R Horandel, K-H Kampert, H O Klages, H J Mathes, H J Mayer, J Milke, J Oehlschlager, S Ostapchenko, **M Petcu**, T Pierog, H Rebel, A Risse, M Risse, M Roth, G Schatz, H Schieler, H Ulrich, J van Buren, A Weindl, J Wochele, J Zabierowski, **J. Phys. G**: Nucl. Part. Phys. 34 (2007) 2581-2593	2007	J PHYS G NUCL PARTIC	1,00000	0
549	E12 -A 13-3	DFN	**Measurement of radio emission from extensive air showers with LOPES** W.D. Apel, J.C. Arteaga, T. Asch, F. Badea, L. BÃ¤hren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, i, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, O. Kramer, J. Kuijpers, S. Lafebre, P. luczak, M. Ludwig, H.J. Mathes, H.J. Mayer, M. Melissas, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, N. Palmieri, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F.G. Schroder, O. Sima, K. Singh, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski and J.A. Zensus, **Nucl. Instr. and Meth. A** 630 (2011) 171	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
550	E12 -A 13-4	DFN	**Muon Production Height Studies with the Air Shower Experiment KASCADE-Grande** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, I, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, P. Luczak, H.J. Mathes, H.J. Mayer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stampert, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer and J. Zabierowski, **Astroparticle Physics** 34 (2011) 476-485	2011	Astroparticle Physics	1,78619	2
551	E12 -A 13-5	DFN	**Restoring the azimuthal symmetry of lateral distributions of charged particles in the range of the KASCADE-Grande experiment** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, I, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, P. Luczak, H.J. Mathes, H.J. Mayer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer and J. Zabierowski, **Nucl. Instr. and Meth. A** 638 (2011) 147-156	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	13
552	E12 -A 13-6	DFN	**Investigations of the radio signal of inclined showers with LOPES** W.D. Apel, J.C. Arteaga, T. Asch, F. Badea, L. Bahren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, i, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, O. Kromer, J. Kuijpers, S. Lafebre, P. luczak, M. Ludwig, H.J. Mathes, H.J. Mayer, M. Melissas, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, N. Palmieri, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F.G. Schroder, O. Sima, K. Singh, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski and J.A. Zensus, **Nucl. Instr. and Meth. A** doi:10.1016/j.nima.2010.11.141	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	23
553	E12 -A 13-7	DFN	**Lateral distribution of the radio signal in extensive air showers measured with LOPES** W.D. Apel, J.C. Arteaga, T. Asch, F. Badea, L. BÃ¤hren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, i, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, O. Kromer, J. Kuijpers, S. Lafebre, P. luczak, M. Ludwig, H.J. Mathes, H.J. Mayer, M. Melissas, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, N. Palmieri, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F.G. Schroder, O. Sima, K. Singh, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski and J.A. Zensus, **Astroparticle Physics** 32 (2010) 294-303	2010	Astroparticle Physics	1,78619	3

554	E12 -A 13-8	DFN	**Latest Results and Perspectives of the KASCADE-Grande EAS Facility** W.D. Apel, J.C. Arteaga, F. Badea, K. Bekk, M. Bertaina, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, E. Cantoni, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, I, F. Di Pierro, P. Doll, R. Engel, J. Engler, M. Finger, D. Fuhrmann, P.L. Ghia, H.J. Gils, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, H.O. Klages, P. Luczak, H.J. Mathes, H.J. Mayer, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, J. Oehlschlager, S. Ostapchenko S. Over, **M. Petcu**, T. Pierog, H. Rebel, M. Roth, H. Schieler, F. Schroder, O. Sima, M. Stumpert, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer and J. Zabierowski, **Nucl. Instr. and Meth. A** doi:10.1016/j.nima.2010.11.126	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	1
555	E12 -A 13-9	DFN	**Measuring the radio emission of cosmic ray air showers with LOPES** W.D. Apel, J.C. Arteaga, T. Asch, F. Badea, L. BÃ¤hren, K. Bekk, M. Bertaina, P.L. Biermann, J. Blumer, H. Bozdog, **I.M. Brancus**, M. Bruggemann, P. Buchholz, S. Buitink, E. Cantoni, i, A. Chiavassa, F. Cossavella, K. Daumiller, V. de Souza, F. Di Pierro, P. Doll, R. Engel, H. Falcke, M. Finger, D. Fuhrmann, H. Gemmeke, P.L. Ghia, R. Glasstetter, C. Grupen, A. Haungs, D. Heck, J.R. Horandel, A. Horneffer, T. Huege, P.G. Isar, K.-H. Kampert, D. Kang, D. Kickelbick, O. Kromer, J. Kuijpers, S. Lafebre, P. Å‚uczak, M. Ludwig, H.J. Mathes, H.J. Mayer, M. Melissas, **B. Mitrica**, C. Morello, G. Navarra, S. Nehls, A. Nigl, J. Oehlschlager, S. Over, N. Palmieri, **M. Petcu**, T. Pierog, J. Rautenberg, H. Rebel, M. Roth, **A. Saftoiu**, H. Schieler, A. Schmidt, F.G. Schroder, O. Sima, K. Singh, **G. Toma**, G.C. Trinchero, H. Ulrich, A. Weindl, J. Wochele, M. Wommer, J. Zabierowski and J.A. Zensus, **Nucl. Instr. and Meth. A**, 617 (2010) 515-516	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	1
556	E13 -A 14-1	DFN	Morjean, M., Jacquet, D., Charvet, J.L., L'Hoir, A., Laget, M., **Parlog, M.**, Chbihi, A., Chevallier, M., Cohen, C., Dauvergne, D., Dayras, R., Drouart, A., Escano-Rodriguez, C., Frankland, J.D., Kirsch, R., Lautesse, P., Nalpas, L ., Ray, C., Schmitt, C., Stodel, C., Tassan-Got, L., Testa, E., Volant, C.,Fission Time Measurements: A New Probe into Superheavy Element Stability, **Phys. Rev. Lett.** 101, 072701 (2008).	2008	PHYSICAL REVIEW LETTERS	7,98625	0
557	E13 -A 14-10	DFN	**Ad.R. Raduta** and F. Gulminelli, Isospin dependent thermodynamics of fragmentation, **Phys. Rev. C** 75, 044605 (2007).	2007	Physical Review C	1,24767	0
558	E13 -A 14-11	DFN	**Ad.R. Raduta** and F. Gulminelli, Multifragmentation and the symmetry term of the nuclear equation of state, **Phys. Rev. C** 75, 024605 (2007).	2007	Physical Review C	1,24767	0
559	E13 -A 14-12	DFN	P. Bém, E. Šimečková, M. Honusek, U. Fischer, S. P. Simakov, R. A. Forrest, **M. Avrigeanu, A. C. Obreja, F. L. Roman,** and **V. Avrigeanu**, Low and medium energy deuteron-induced reactions on 27Al, **Phys. Rev.**	2009	Physical Review C	1,24767	0
560	E13 -A 14-13	DFN	Zbiri, K., Le Fevre, A., Aichelin, J., Lukasik, J., Reisdorf, W., Gulminelli, F., Lynen, U., Muller, W.F.J., Orth, H., Schwarz, C., Sfienti, C., Trautmann, W., Turzo, K., Zwieglinski, B., Charvet, J.L., Charvet, J. L., Chbihi, A., Dayras, R., Durand, D., Frankland, J.D., Legrain, R., Le Neindre, N., Lopez, O., Nalpas, L., **Parlog, M.**, Plagnol, E., Rivet, M.F., Rosato, E., Vient, E., Vigilante, M., Volant, C., Wieleczko, J.P., ALADIN Collaboration, INDRA Collaboration, Transition from participant to spectator fragmentation in Au+Au reactions between 60A and 150A MeV, **Phys. Rev. C** 75, 034612 (2007).	2007	Physical Review C	1,24767	0
561	E13 -A 14-14	DFN	**M. Avrigeanu** and **V. Avrigeanu**, α-particle optical potential tests below the Coulomb barrier, **Phys. Rev. C** 79, 027601 (2009).	2009	Physical Review C	1,24767	0
562	E13 -A 14-15	DFN	**I. Cata-Danil, D. Filipescu, M. Ivascu, D. Bucurescu, N. V. Zamfir, T. Glodariu, L. Stroe, G. Cata-Danil, D. G. Ghita, C. Mihai,G. Suliman, T. Sava,** Astrophysical S factor for alpha capture on Sn-115, **Phys. Rev. C** 78, 035803 (2008).	2008	Physical Review C	1,24767	2
563	E13 -A 14-16	DFN	Galichet, E., Rivet, M.F., Borderie, B., Colonna, M., Bougault, R., Chbihi, A., Dayras, R., Durand, D., Frankland, J.D., Guinet, D.C.R., Lautesse, P., Le Neindre, N., Lopez, O., Manduci, L., **Parlog, M.**, Rosato, E., Tamain,	2009	Physical Review C	1,24767	0
564	E13 -A 14-17	DFN	G. G. Kiss, P. Mohr, Zs. Fülöp, D. Galaviz, Gy. Gyürky, Z. Elekes, E. Somorjai, A. Kretschmer, K. Sonnabend, A. Zilges, and **M. Avrigeanu**, High precision 89Y(α,α)89Y scattering at low energies, **Phys. Rev. C** 80, 045807 (2009).	2009	Physical Review C	1,24767	2
565	E13 -A 14-18	DFN	**M. Avrigeanu** and **V. Avrigeanu**, α-particle nuclear surface absorption below the Coulomb barrier in heavy nuclei, **Phys. Rev. C** 82, 014606 (2010).	2010	Physical Review C	1,24767	0
566	E13 -A 14-19	DFN	H. Comisel, **C. Hategan**, G. Graw, H.H. Wolter, Proton threshold states in 22Na(p,g)23Mg reaction and astrophysical implications, **Phys. Rev. C** 75, 045807 (2007).	2007	Physical Review C	1,24767	0
567	E13 -A 14-2	DFN	Bonnet, E., Mercier, D., Borderie, B., Gulminelli, F., Rivet, M.F., Tamain, B., Bougault, R., Chbihi, A., Dayras, R., Frankland, J.D., Galichet, E., Gagnon-Moisan, F., Guinet, D., Lautesse, P., Lukasik, J., Le Neindre, N., **Parlog, M.**, Rosato, E., Roy, R., Vigilante, M., Wieleczko, J.P., Zwieglinski, B., INDRA Collaboration, ALADIN Collaboration,Bimodal Behavior of the Heaviest Fragment Distribution in Projectile Fragmentation, **Phys. Rev. Lett.** 103, 072701 (2009).	2009	PHYSICAL REVIEW LETTERS	7,98625	4
568	E13 -A 14-20	DFN	**M. Avrigeanu** and A. M. Moro, Improved deuteron elastic breakup energy dependence via the continuum-discretized coupled-channels method, **Phys. Rev. C** 82, 037601 (2010).	2010	Physical Review C	1,24767	3
569	E13 -A 14-21	DFN	**M. Avrigeanu** and **V. Avrigeanu**, Additional α-particle optical potential tests below the Coulomb barrier, **Phys. Rev. C** 81, 038801 (2010).	2010	Physical Review C	1,24767	9
570	E13 -A 14-22	DFN	K. Zerva, N. Patronis, A. Pakou, N. Alamanos, X. Aslanoglou, **D. Filipescu, T. Glodariu,** M. Kokkoris, M. La Commara M, A. Lagoyannis, M. Mazzocco, N.G. Nicolis, D. Pierroutsakou, M. Romoli, K. Rusek, Elastic backscattering measurements for Li-6+Si-28 at sub- and near-barrier energies, **Phys. Rev. C** 80, 017601 (2009).	2009	Physical Review C	1,24767	0
571	E13 -A 14-23	DFN	K. Zerva, A. Pakou, K. Rusek, N. Patronis, N. Alamanos, X. Aslanoglou, **D. Filipescu, T. Glodariu**, N. Keeley, M. Kokkoris, M. La Commara, A. Lagoyannis, M. Mazzocco, N. G. Nicolis, D. Pierroutsakou, and M. Romoli, Probing the potential and reaction coupling effects of Li-6,Li-7+Si-28 at sub- and near-barrier energies with elastic backscattering, **Phys. Rev. C** 82, 044607 (2010).	2010	Physical Review C	1,24767	1
572	E13 -A 14-24	DFN	**Ad.R. Raduta** and F. Gulminelli, Thermodynamics of clusterized matter, **Phys. Rev. C** 80, 024606 (2009)	2009	Physical Review C	1,24767	0
573	E13 -A 14-25	DFN	**D. Filipescu, V. Avrigeanu, T. Glodariu, C. Mihai, D. Bucurescu, M. Ivaşcu, I. Căta-Danil, L. Stroe, O. Sima, G. Căta-Danil, D. Deleanu, D. G. Ghiţă, N. Mărginean, R. Mărginean, A. Negret, S. Pascu, T. Sava, G. Suliman,** and **N. V. Zamfir,** Cross sections for α-particle induced reactions on 115,116Sn around the Coulomb barrier, **Phys. Rev. C** 83, 064609 (2011).	2011	Physical Review C	1,24767	0
574	E13 -A 14-26	DFN	E. Šimečková, P. Bém, M. Honusek, M. Štefánik, U. Fischer, S. P. Simakov, R. A. Forrest, A. J. Koning, J.-C. Sublet, **M. Avrigeanu, F. L. Roman**, and **V. Avrigeanu**, Low and medium energy deuteron-induced reactions on 63,65Cu nuclei, **Phys. Rev. C** 84, 014605 (2011).	2011	Physical Review C	1,24767	0

575	E13 -A 14-27	DFN	**V. Avrigeanu** and **M. Avrigeanu**, Analysis of α-induced reactions on 151Eu below the Coulomb barrier, **Phys. Rev. C** 83, 017601 (2011).	2011	Physical Review C	1,24767	0
576	E13 -A 14-28	DFN	M. Mazzocco, C. Signorini, D. Pierroutsakou, **T. Glodariu**, A. Boiano, C. Boiano, F. Farinon, P. Figuera, **D. Filipescu**, L. Fortunato, A. Guglielmetti, G. Inglima, M. La Commara, M. Lattuada, P. Lotti, C. Mazzocchi, P. Molini, A. Musumarra, A. Pakou, C. Parascandolo, N. Patronis, M. Romoli, M. Sandoli, V. Scuderi, F. Soramel, **L. Stroe**, D. Torresi, E. Vardaci, and A. Vitturi, Reaction dynamics for the system 17F+58Ni at near-barrier energies, **Phys. Rev. C** 82, 054604 (2010).	2010	Physical Review C	1,24767	10
577	E13 -A 14-29	DFN	**Ad.R. Raduta** and F. Gulminelli, Statistical description of complex nuclear phases in supernovae and proto-neutron stars, **Phys. Rev. C** 82, 065801 (2010).	2010	Physical Review C	1,24767	0
578	E13 -A 14-3	DFN	E. Bonnet, B. Borderie, N. Le Neindre, **Ad. R. Raduta**, M. F. Rivet, R. Bougault, A. Chbihi, J. D. Frankland, E. Galichet, F. Gagnon-Moisan, D. Guinet, P. Lautesse, J. Lukasik, P. Marini, M. Parlog, E. Rosato, R. Roy, G. Spadaccini, M. Vigilante, J. P. Wieleczko, and B. Zwieglinski, New Scalings in Nuclear Fragmentation, **Phys. Rev. Lett.** 105, 142701 (2010).	2010	PHYSICAL REVIEW LETTERS	7,98625	3
579	E13 -A 14-30	DFN	**Ad.R. Raduta**, Break-up fragment topology in statistical multifragmentation models, **Phys. Rev. C** 80, 014602 (2009)	2009	Physical Review C	1,24767	0
580	E13 -A 14-31	DFN	**Ad.R. Raduta**, E. Bonnet, B. Borderie, N. Le Neindre, S. Piantelli, M.F. Rivet, Break-up stage restoration in multifragmentation reactions, **Eur. Phys. J. A** 32, 175-182 (2007).	2007	European Physical Journal A	1,10519	22
581	E13 -A 14-32	DFN	C. Signorini, D. Pierroutsakou, B. Martin, M. Mazzocco, **T. Glodariu**, R. Bonetti, A. Guglielmetti, M. La Commara, M. Romoli, M. Sandoli, E. Vardaci, H. Esbensen, F. Farinon, P. Molini, C. Parascandolo, F. Soramel, S. Sidortchuk, and **L. Stroe**, Interaction of F-17 with a Pb-208 target below the Coulomb barrier, **Eur. Phys. J. A** 44, 63 (2010).	2010	European Physical Journal A	1,10519	3
582	E13 -A 14-33	DFN	Secondary neutrons as the main source of neutro+B49n-rich fission products in the bombardment of a thick U target by 1 GeV protons Barzakh, A. E; Lhersonneau, G; Batist, L. Kh; Fedorov, D. V; Ivanov, V. S; Mezilev, K. A; Molkanov, P. L; Moroz, F. V; Orlov, S. Yu; Panteleev, V. N; Volkov, Yu. M.; Alyakrinskiy, O; Barbui, M; **Stroe, L**; Tecchio, L. B.; **Eur. Phys. J. A** 47, 70 (2011).	2011	European Physical Journal A	1,10519	13
583	E13 -A 14-34	DFN	M. D'Agostino, M. Bruno, F. Gulminelli, L. Morelli, G. Baiocco, L. Bardelli, S. Barlini, F. Cannata, G. Casini, E. Geraci, F. Gramegna, V.L. Kravchuk, T. Marchi, A. Moroni, A. Ordine, **Ad.R. Raduta**, Reaction mechanisms and staggering in S+Ni collisions, **Nucl. Phys. A** 861, 47 (2011).	2011	NUCLEAR PHYSICS A	1,09321	0
584	E13 -A 14-35	DFN	Bonnet, E., Borderie, B., Le Neindre, N., Rivet, M.F., Bougault, R., Chbihi, A., Dayras, R., Frankland, J.D., Galichet, E., Gagnon-Moisan, F., Guinet, D., Lautesse, P., Lukasik, J., Mercier, D., **Parlog, M.**, Rosato, E., Roy, R., Sfienti, C., Vigilante, M., Wieleczko, J.P., Zwieglinski, B., Fragment properties of fragmenting heavy nuclei produced in central and semi-peripheral collisions, **Nucl. Phys. A** 816, 1 (2009).	2009	NUCLEAR PHYSICS A	1,09321	16
585	E13 -A 14-35	DFN	**M. Avrigeanu**, S.V. Chuvaev,A.A. Filatenkov, R.A. Forrest, M. Herman, A.J. Koning, A.J.M. Plompen, **F.L. Roman**, and **V. Avrigeanu**, Fast-neutron induced preequilibrium reactions on 55Mn and 63,65Cu at energies up to 40 MeV, **Nucl. Phys. A** 806, 15 (2008).	2008	NUCLEAR PHYSICS A	1,09321	0
586	E13 -A 14-36	DFN	G. Noguere, E. Rich, C. De Saint Jean, O. Litaize, P. Siegler, and **V. Avrigeanu**, Average neutron parameters for hafnium, Nucl. Phys. A 831, 106 (2009).	2009	NUCLEAR PHYSICS A	1,09321	0
587	E13 -A 14-37	DFN	Grenier, F., Chbihi, A., Roy, R., Verde, G., Theriault, D., Frankland, J.D., Wieleczko, J.P., Borderie, B., Bougault, R., Dayras, R., Galichet, E., Guinet, D., Lautesse, P., Le Neindre, N., Lopez, O., Moisan, J., Nalpas, L ., Napolitani, P., **Parlog, M.**, Rivet, M.F., Rosato, E., Tamain, B., Vient, E., Vigilante, M.,Multi-particle correlation function to study short-lived nuclei, **Nucl. Phys. A** 811, 233 (2008).	2008	NUCLEAR PHYSICS A	1,09321	2
588	E13 -A 14-39	DFN	Hamrita, H., **Parlog, M.,** Borderie, B., Lavergne, L., Le Neindre, N., Rivet, M.F., Barbey, S., Bougault, R., Chabot, M., Chbihi, A., Cussol, D.,Santos, F. de Oliveira, Edelbruck, P., Frankland, J.D., Galichet, E.· Guinet, D., Lautesse, P., Lopez, O., Martinet, G., Orr, N.A., Piantelli, S., Tillier, J., Politi, G., Rauly, E., Rosato, E., Tamain, B., Vient, E., Vigilante, M.,Description of current pulses induced by heavy ions in silicon detectors, **Nucl. Instrum. Meth. Phys. Res. A** 642, 59 (2011).	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	5
589	E13 -A 14-4	DFN	**Ad.R. Raduta**, B. Borderie, E. Geraci, N. Le Neindre, P. Napolitani, M.F. Rivet, R. Alba, F. Amorini, G. Cardella, M. Chatterjee, E. De Filippo, D. Guinet, P. Lautesse, E. La Guidara, G. Lanzalone, G. Lanzano, I. Lombardo, O. Lopez, C. Maiolino, A. Pagano, S. Pirrone, G. Politi, F. Porto, F. Rizzo, P. Russotto, J.P. Wieleczk, Evidence for α-particle condensation in nuclei from the Hoyle state deexcitation, **Phys. Lett. B** 705, 65 (2011).	2011	PHYSICS LETTERS B	3,62428	13
590	E13 -A 14-40	DFN	**Parlog, M.**, Hamrita, H., Borderie, B., Description of current pulses induced by heavy ions in silicon detectors, **Nucl. Instrum. Meth. Phys. Res. A** 613, 290 (2009).	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	0
591	E13 -A 14-41	DFN	Barlini, S., Bougault, R., Laborie, P., Lopez, O., Mercier, D., **Parlog, M.**, Tamain, B., Vient, E., Chevallier, E., Chbihi, A., Jacquot, B., Kravchuk, V.L., New digital techniques applied to A and Z identification using pulse shape discrimination of silicon detector current signals, **Nucl. Instrum. Meth. Phys. Res. A** 600, 644 (2009).	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	16
592	E13 -A 14-42	DFN	G.G. Kiss, Zs. Fulop, Gy. Gyurky, Z. Ma te, E. Samorjai, D. Galaviz, S. Muller, A. Zilges, P. Mohr, and **M. Avrigeanu**, Study of the 89Y(a,a)89Y reaction close to the Coulomb barrier, **J. Phys. G: Nucl. Part. Phys.** 35, 014037 (2008).	2008	J PHYS G NUCL PARTIC	1,00000	1
593	E13 -A 14-43	DFN	F. Farinon, **T. Glodariu**, M. Mazzocco, A. Battistella, R. Bonetti, L. Costa, A. De Rosa, A. Guglielmetti, G. Inglima, M. La Commara, V.Z. Maidikov, B. Martin, C. Mazzocchi, D. Pierroutsakou, M. Romoli, M. Sandoli, C. Signorini, F. Soramel, **L. Stroe**, E. Vardaci, Commissioning of the EXOTIC beam line, **Nucl. Instr. Meth. Phys. Res. B** 266, 4097 (2008).	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	1
594	E13 -A 14-44	DFN	M. Mazzocco, F. Farinon, **T. Glodariu**, H. Geissel, A. Guglielmetti, N. Iwasa, M. La Commara, B. Martin, C. Mazzocchi, D. Pierroutsakou, M. Romoli, M. Sandoli, C. Signorini, F. Soramel, **L. Stroe**, E. Vardaci, H. Weick, M. Winkler, Production and separation of light low-energy radioactive ion beams with the EXOTIC beam-line at LNL, **Nucl. Instr. Meth. Phys. Res. B** 266, 4665 (2008).	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	0
595	E13 -A 14-45	DFN	P. Pereslavtsev, U. Fischer, S. Simakov, **M. Avrigeanu**, Evaluation of d+6,7Li data for deuteron incident energies up to 50 MeV, **Nucl. Instr. Meth. Phys. Res. B** 266, 3501 (2008).	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	0
596	E13 -A 14-46	DFN	**M. Avrigeanu**, W. von Oertzen, R.A. Forrest, **A. Obreja, F.L. Roman**, and **V. Avrigeanu**, Analysis of deuteron elastic scattering and induced activation on light and medium nuclei for IFMIF EVEDA, **Fusion Eng. Design** 84, 418 (2009).	2009	Fusion Eng. Design	0,82286	2
597	E13 -A 14-47	DFN	**C. Hategan, R.A. Ionescu**, H.H. Wolter, The boundary condition model approach to Borromean nuclei, **Mod. Phys. Lett. A** 22, 1469 (2007).	2007	Modern Physics Letters A	0,55713	2

598	E13 -A 14-48	DFN	H. Comisel, **C. Hategan**, H.H. Wolter, Nuclear threshold effects and neutron strength functions, **Physics of Particles and Nuclei** 41, 574 (2010).	2010	Physics of Particles and Nuclei	0,296	4
599	E13 -A 14-49	DFN	Cross Sections for Neutron Inelastic Scattering on (28)Si, **Negret, A**; Borcea, C; Plompen, A. J. M, **J. Korean Phys. Soc.** 59, 1765 (2011).	2011	J. Korean Phys. Soc.	0,28408	0
600	E13 -A 14-5	DFN	B. Martin, D. Pierroutsakou, C. Agodi, R. Alba, V. Baran, A. Boiano, G. Cardella, M. Colonna, R. Coniglione, E. De Filippo, A. Del Zoppo, M. Di Toro, G. Inglima, **T. Glodariu**, M. La Commara, C. Maiolino, M. Mazzocco, A. Pagano, P. Piattelli, S. Pirrone, C. Rizzo, M. Rornoli, M. Sandoli, D. Santonocito, P. Sapienza, C. Signorini, Prompt dipole radiation in fusion reactions, **Phys. Lett. B** 664, 47 (2008).	2008	PHYSICS LETTERS B	3,62428	0
601	E13 -A 14-50	DFN	E. Simeckova, P. Bem, M. Honusek, L. Zavorka ,U. Fischer, S.P. Simakov, R.A. Forrest, **M. Avrigeanu, V. Avrigeanu**, and **F.L. Roman**, On Low and Medium Energy Deuteron-induced Reactions on 63,65Cu, **J. Korean Phys. Soc.** 59, 1928 (2011).	2011	J. Korean Phys. Soc.	0,28408	0
602	E13 -A 14-51	DFN	**M. Avrigeanu** and **V. Avrigeanu**, Analysis of Deuteron Breakup and Induced Activation on Medium Nuclei, **J. Korean Phys. Soc.** 59 (2011) 903.	2011	J. Korean Phys. Soc.	0,28408	0
603	E13 -A 14-52	DFN	Neutron Inelastic Cross Section Measurements for Sodium, Rouki, C; Kopecky, S; Nankov, N; Plompen, A. J. M; Stanoiu, M; Borcea, C; **Negret, A; J. Korean Phys. Soc.** 59, 1660 (2011).	2011	J. Korean Phys. Soc.	0,28408	0
604	E13 -A 14-53	DFN	**V. Avrigeanu** and **M. Avrigeanu**, Key Issues for Consistent Description of Neutron-induced Reactions on Cr Isotopes, **J. Korean Phys. Soc.** 59, 891 (2011).	2011	J. Korean Phys. Soc.	0,28408	0
605	E13 -A 14-54	DFN	Galichet, E., Rivet, M.F.,Borderie, B., Colonna, M., Bougault, R., Durand, D., Le Neindre, N., Lopez, O., Manduci, L., Vient, E., Chbihi, A., Frankland, J.D., Wieleczko, J.P., Dayras, R., Volant, C., Guinet, D.C.R., Lautesse, P., **Parlog, M.**, Rosato, E., Vigilante, M., INDRA Collaboration, The isospin diffusion in 58Ni-induced reactions at intermediate energies, **Int. Jour. Mod. Phys. E** 19, 1534 (2010).	2010	International Journal of Modern Physics E	0,26099	5
606	E13 -A 14-55	DFN	Tippawan U.; Pomp S.; Blomgren J., **Corcalciuc V.; et al.** Light charged-particle production in 96 MeV neutron-induced reactions on carbon and oxygen RADIATION PROTECTION DOSIMETRY Volume: 126 Issue: 1-4 Pages: 35-39, 2007	2007	RAD PROT DOSIM	0,85714	**0**
607	E13 -A 14-56	DFN	Tippawan U.; Pomp S.; Blomgren J, **Corcalciuc V.**; et al. Double-differential cross sections and kerma coefficients for light-charged particles produced by 96 MeV neutrons on carbon RADIATION MEASUREMENTS Volume: 45 Issue: 10 Special Issue: SI Pages: 1134-1138, 2010	2010	RADIAT MEAS	1,27714	**0**
608	E13 -A 14-57	DFN	Tippawan U.; Pomp S.; Blomgren J.; **Corcalciuc V.**; et al. Light-ion production in the interaction of 96 MeV neutrons with carbon PHYSICAL REVIEW C Volume: 79 Issue: 6 Article Number: 064611 DOI: 10.1103/PhysRevC.79.064611 Published: JUN 2009	2009	PHYS REV C	1,24767	**8**
609	E13 -A 14-6	DFN	U. Fischer, **M. Avrigeanu**, P. Pereslavtsev, S.P. Simakov, I. Schmuck, Evaluation and validation of d+6Li cross section data for the IFMIF neutron source term simulation, **J. Nucl. Mater.** 370, 1531 (2007).	2007	Journal of Nuclear Materials	2,44928	2
610	E13 -A 14-7	DFN	R. Capote, M. Herman, P. Oblozinsky, P.G. Young, S. Goriely, T. Belgya, A.V. Ignatyuk, A.J. Koning, S. Hilaire, V.A. Plujko, **M. Avrigeanu**, O. Bersillon, M.B. Chadwick, T. Fukahori, Zhigang Ge, Yinlu Han, S. Kailas, J. Kopecky, V.M. Maslov, G. Reffo, M. Sin, E.Sh. Soukhovitskii, and P. Talou, RIPL - Reference Input Parameter Library for Calculation of Nuclear Reactions and Nuclear Data Evaluations, **Nucl. Data Sheets** 110, 3107 (2009).	2009	Nuclear Data Sheets	2,13715	10
611	E13 -A 14-8	DFN	**M. Avrigeanu**, W. von Oertzen, **R.A. Forrest, A. Obreja, F.L. Roman**, and **V. Avrigeanu**, Complementary optical-potential analysis of alpha-particle elastic scattering and induced reactions at low energies, **Atomic Data Nucl. Data Tables** 95 501, (2009).	2009	Atomic Data Nucl. Data Tables	2,09982	5
612	E13 -A 14-9	DFN	D. Ionescu, **R.A. Ionescu**, Analytical insights on ion behaviour at interfaces**, J. Electroanal. Chem.** 650, 205 (2010).	2010	J. Electroanal. Chem.	1,402	0
613	E14 -A 15-1	DFN	O.V.Stolbov, Yu.L.Raikher, **M.Balasoiu**, Modelling of magnetodipolar striction in soft magnetic elastomers, **Soft Matter**, 7, 8484-8487, 2011.	2011	Soft Matter	5,31915	0
614	E14 -A 15-10	DFN	**G. Velisa**, A. Debelle, L. Vincent, L. Thomé, A. Declémy and **D. Pantelica**, He implantation in cubic zirconia: Deleterious effect of thermal annealing**, Journal of Nuclear Materials** 402 , 87-92, 2010.	2010	Journal of Nuclear Materials	2,44928	0
615	E14 -A 15-11	DFN	A. Ene, **A. Pantelica**, Study of transfer of minor elements during ironmaking by neutron activation analysis, **Radiochimica Acta** 98 (1) 53-57, 2010.	2010	Radiochimica Acta	1,13143	0
616	E14 -A 15-12	DFN	**G. Velisa**, A. Debelle, L. Vincent, L. Thomé, **D. Pantelica** and A. Declémy, Study of the structural modifications induced by He implantation in cubic zirconia, **Nucl. Instr. Meth. B** 268, 2984-2986, 2010.	2010	Nuclear Instruments and Methods in Physics Research B	0,95429	1
617	E14 -A 15-13	DFN	**M.Balasoiu**, M.L.Craus, **E.M.Anitas**, I.Bica, J.Plestil, A.I.Kuklin, Microstructure of stomaflex based magnetic elastomers, **Physics of the Solid State**, 52, 5, 917-921, 2010.	2010	Physics of the Solid State	0,35316	0
618	E14 -A 15-14	DFN	Yu. L. Raikher, V.I.Stepanov, S.V.Stolyar, V.P.Ladygina, D.A.Balaev, L.A. Ishchenko, **M.Balasoiu**, Magnetic properties of biomineral nanoparticles produced by Klebsiella oxytoca bacteria, **Physics of Solid State**, 52, 2, 277-284, 2010.	2010	Physics of the Solid State	0,35316	0
619	E14 -A 15-15	DFN	L. Ion, V. Ghenescu, S. Iftimie, V. A. Antohe, A. Radu, **M. Gugiu, G. Velisa**, O. Porumb, S. Antohe, Temperature dependent resistivity and Hall effect in proton irradiated CdS thin films, **Journal of Optoelectronics and Advanced Materials Rapid Communications** 4, 1414-1117, 2010.	2010	Journal of Optoelectronics and Advanced Materials Rapid Communications	0,32990	5
620	E14 -A 15-16	DFN	**Aranghel D.**, Tripadus, V., Radulescu A., **Petre M.**, Dima M. O., Petre C., Quasielastic neutron scattering on glycerol, **Journal of Optoelectronics and Advanced Materials**, 12, 953-957, 2010.	2010	Journal of Optoelectronics and Advanced Materials Rapid Communications	0,32990	2
621	E14 -A 15-17	DFN	L. Ion, V. Ghenescu, S. Iftimie, V. A. Antohe, A. Radu, **M. Gugiu, G. Velisa**, O. Porumb, S. Antohe, Temperature dependent resistivity and Hall effect in proton irradiated CdS thin films,**Optoelectronics and Advanced Materials - Rapid Communications** (OAM-RC) 4, 1114 – 1117, 2010.	2010	J OPTOELECTRON ADV M	0,32990	2
622	E14 -A 15-18	DFN	Dima, M., Dulea, M., **Aranghel, D.**, **Mitrica, B., Petre, M.**, Stoica, M., Udrea, M., Sterian, R., Sterian, P., Classical and quantum communications in grid computing, **Optoelectronics and Advanced Materials-Rapid Communications** 4, 11, 1840-1843, 2010.	2010	J OPTOELECTRON ADV M	0,32990	0
623	E14 -A 15-19	DFN	**M. Balasoiu**, L.A. Ischenko, S.V. Stolyar, R.S. Iskhakov, Yu.L. Raikher, A.I. Kuklin, D.V. Soloviov, T.S. Kurkin, D. Aranghel, G.M. Arzumanian, Structural investigation of biogenic ferrihydrite nanoparticles dispersion, **Optoelectronics and Advanced Materials – Rapid Communications**, 4, 12, 2136-2139, 2010.	2010	J OPTOELECTRON ADV M	0,32990	2
624	E14 -A 15-2	DFN	Mihaela Filipescu, **Gihan Velisa,** Valentin Ion, Andreea Chis, Nicolae Scintee**, Paul Ionescu, Dan Pantelica**, Maria Dinescu, Silicon carbide thin films as nuclear ceramic grown by laser ablation , **Journal of Nuclear Materials** 416, 18-21, 2011.	2011	Journal of Nuclear Materials	2,44928	0

625	E14 -A 15-20	DFN	A. Yu. Cherny, **E. M. Anitas**, A. I. Kuklin, **M. Balasoiu**, V. A. Osipov, Small-angle scattering from the deterministic fractal systems, **Journal of Surface Investigation. X-ray, Synchrotron and Neutron Techniques** 4(11), 903-907, 2010.	2010	Journal of Surface Investigation.	0,16279	22
626	E14 -A 15-21	DFN	Tripadus V., Zanotti J. M., **Statescu M.**, Constantinescu O., Mitra S., **Aranghel D.**, Molecular dynamics in hydrated sodium alginate by quasielastic and elastic neutron scattering, **Chemical Physics**, 365, 30-37, 2009.	2009	Chemical Physics	1,23117	0
627	E14 -A 15-22	DFN	E.A. Preoteasa, E. Preoteasa, **C. Ciortea, D.M. Dumitru, D. Gurban, M. Gugiu, A. Scafes**, PIXE and PIGE assessment of in vivo elemental and physical changes of a composite from a dental filling, **X-ray Spectrometry** 38, 548, 2009.	2009	X-ray Spectrometry	0,84032	0
628	E14 -A 15-23	DFN	V. Ghenescu, L. Ion, M. Ghenescu, M. Rusu, **M. Gugiu, G. Velisa**, Oana Porumb, S. Antohe, Effects of proton irradiation on structural and optical properties of CdS thin films used in photovoltaic applications, **Journal of Optoelectronics and Advanced Materials - Rapid Communications** 3, 1023-1026, 2009.	2009	J OPTOELECTRON ADV M	0,32990	0
629	E14 -A 15-24	DFN	**E. M. Anitas, M. Balasoiu**, I. Bica, V. A. Osipov, A. I. Kuklin, Small-angle neutron scattering analysis of the microstructure of Stomaflex Creme - Ferrofluid based elastomers, **Optoelectronics and Advanced Materials - Rapid Comunications**, 3, 6, 621-624, 2009.	2009	J OPTOELECTRON ADV M	0,32990	0
630	E14 -A 15-25	DFN	N.D. Scarisoreanu, G. Dinesc,u R. Birjega, M. Dinescu, **D. Pantelica, G. Velisa, N. Scintee**, A.C. Galca, SBN thin films growth by RF plasma beam assisted pulsed laser deposition, **Applied Physics A-Materials Science & Processing**, 93, 795-800, 2008.	2008	Applied Physics A-Materials Science & Processing	1,45182	0
631	E14 -A 15-26	DFN	Tripadus V., **Aranghel D.**, **Statescu M.,** Buchsteine A., Molecular dynamics in DTGS (ND(3)) by quasielastic and inelastic neutron scattering, **Chemical Physics**, 353, 59-65, 2008.	2008	Chemical Physics	1,23117	28
632	E14 -A 15-27	DFN	**M.Balasoiu**, S.G.Barsov, D.Bica, L.Vekas, S.I.Vorobev, K.I.Gritsaj, V.N.Duginov, V.A.Zhukov, E.N.Komarov, V.P.Koptev, S.A.Kotov, T.N.Mamedov, K.Petrescu, G.V. Shcherbakov, **Journal of Experimental and Theoretical Physics**, 88, 3, 243-247, 2008.	2008	Journal of Experimental and Theoretical Physics	0,738	0
633	E14 -A 15-28	DFN	**Balasoiu M.**, Craus M. L., Kuklin A. I., Plestil J., Haramus V., Islamov A. Kh., **Erhan R.**, **Anitas E. M.**, Lozovan M., Tripadus V., Petrescu C., Savu D., Savu S., Bica I., Microstructure of magnetite doped elastomers investigated by SAXS and SANS, **Journal of Optoelectronics and Advanced Materials**, 10, 11, 2932-2935, 2008.	2008	Journal of Optoelectronics and Advanced Materials Rapid Communications	0,32990	0
634	E14 -A 15-29	DFN	**M.Balasoiu**, V.L.Aksenov, Neutron depolarization and mSR studies of ferrofluids, **Journal of Optoelectronics and Advanced Materials**, 10, 12 , 3322-3327, 2008.	2008	Journal of Optoelectronics and Advanced Materials Rapid Communications	0,32990	3
635	E14 -A 15-3	DFN	**G. Velisa**, A. Debelle, L. Vincent, L. Thomé, A. Declémy, **D. Pantelica**, S. Antohe, Thermal behaviour of helium-implanted spinel single crystals, **Journal of Nuclear Materials** 416, 216-220, 2011.	2011	Journal of Nuclear Materials	2,44928	9
636	E14 -A 15-30	DFN	A. Cunsolo, F. Cappuzzello, M. Cavallaro, A. Foti, A. Khouaja, S. E. A. Orrigo, J. S. Winfield, L. Gasparini, G. Longo, T. Borello-Lewin, M. R. D. Rodrigues, M. D. L. Barbosa, C. Nociforo, **H. Petrascu,** Commissioning of the MAGNEX large-acceptance spectrometer**, European Physical Journal – Special Topics**, 150, 343-346, 2007.	2007	European Physical Journal – Special Topics	0,9	8
637	E14 -A 15-31	DFN	M. Petrascu, A. Constantinescu, I. **Cruceru** , **H.Petrascu** et al., Experimental state of n-n correlation function for Borromean halo nuclei investigation, **Nuclear Physisc A**, 790, 235C, 2007	2007	NUCLEAR PHYSICS A	1,09321	0
638	E14 -A 15-32	DFN	Bogdan Mitrica, Romul Margineanu, Sabin Stoica, Mirel Petcu, Iliana Brancus & col., : A mobile detector for measurements of the atmospheric muon flux in underground sites NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 654 Issue: 1 Pages: 176-183 DOI: 10.1016/j.nima.2011.07.006 Published: OCT 21 2011	2011	NUCLEAR INSTRUMENTS & METHODS	1,02286	0
639	E15 -A 16-1	DFN	B.Adeva, L.Afanasyev, M.Benayoun, A.Benelli, Z.Berka, V.Brekhovskikh, **G.Caragheorgheopol,** T.Cechak, M.Chiba, P.V.Chliapnikov, **C.Ciocarlan**, **S.Constantinescu**, S.Costantini, **C.Curceanu (Petrascu)**, P.Doskarova, D.Dreossi, D.Drijard, A.Dudarev, M.Ferro-Luzzi, J.L.Fungueiriño Pazos, M.Gallas Torreira, J.Gerndt, P.Gianotti, D.Goldini, F.Gomeza, A.Gorinf, O.Gorchakov, C.Guaraldo, **M.Gugiu**, M.Hansroul, Z.Hons, R.Hosek, M.Iliescu, V.Karpukhin, J.Kluson, M.Kobayashi, P.Kokkas, V.Komarov, V.Kruglov, L.Kruglova, A.Kulikov, A.Kuptsov, K.I.Kuroda, A.Lamberto, A.Lanaro, V.Lapshin, R.Lednicky, P.Leruste, P.Levi Sandri, A.Lopez Aguera, V.Lucherini, T.Maki, I.Manuilov, J.Marin, J.L.Narjoux, L.Nemenov, M.Nikitin, T.Nunez Pardo, K.Okada, V.Olchevskii, A.Pazos, **M.Pentia**, A.Penzo, J.M.Perreau, M.Plo, **T.Ponta**, G.F.Rappazzo, A.Riazantsev, J.M.Rodriguez, A.Rodriguez Fernandez, A.Romero Vidal, V.M.Ronjin, V.Rykalin, J.Saborido, C.Santamarina, J.Schacher, C.Schuetzi, A.Sidorov, J.Smolik, F.Takeutchi, A.Tarasov, L.Tauscher, M.J.Tobar, T.Trojek, S.Trusov, V.Utkin, O.Vázquez Doce, S.Vlachos, O.Voskresenskaya, T.Vrba, C.Willmott, V.Yazkov, Y.Yoshimura, M.Zhabitsky, P.Zrelov, "Determination of ππ scattering lengths from measurement of π+π− atom lifetime", **Phys. Lett. B 704, p.24-29 (2011)**	2011	PHYSICS LETTERS B	3,62428	12
640	E15 -A 16-10	DFN	G. Ciavola, S. Gammino, L. Celona, **L.Schachter, S.Dobrescu**, "Status Report of the MS-ECRIS Construction", **High Energy Physics and Nuclear Physics, 31(S1), 13-17, 2007**	2007	High Energy Physics and Nuclear Physics,	0,07	0
641	E15 -A 16-11	DFN	**M.Pentia, C.Ciocarlan, S.Constantinescu, M.Gugiu, Gh.Caragheorgheopol**, Preshower detector for π+π – hadronic atom studies, NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT, vol. 603, issue 3, 309-318, MAY 2009	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	6
642	E15 -A 16-12	DFN	B. Adeva, ..., **G. Caragheorgheopol, C. Ciocarlan, S. Constantinescu, M. Duma, D. Dumitriu, M. Gugiu, M. Pentia**, et al, Dirac collaboration, Evidence for π K-atoms with DIRAC, PHYSICS LETTERS B, Vol.674, 11-16, APR 2009	2009	PHYSICS LETTERS B	3,62428	0
643	E15 -A 16-2	DFN	**L. Schachter**, K. E. Stiebing, **S. Dobrescu**,"Enhanced Confinement in ECRIS Plasma**", Rev. Sci. Instrum. 81, 2, p.02A326, 2010**	2010	Rev. Sci. Instrum	1,69305	0
644	E15 -A 16-3	DFN	K. E. Stiebing, **L. Schachter, S. Dobrescu**, "MD Structures for High Power ECRIS", **Rev. Sci. Instrum. 81, 2, p.02A326, 2010**	2010	Rev. Sci. Instrum	1,69305	0
645	E15 -A 16-4	DFN	**M. Pentia, C. Ciocarlan, S. Constantinescu, M. Gugiu, G. Caragheorgheopol**, "Preshower detector for pi+ pi- hadronic atom studies", **Nucl. Instrum. Meth. A 603, p.309-318 (2009)**	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	12
646	E15 -A 16-5	DFN	**L. Schachter,** K. E. Stiebing, **S. Dobrescu**, "Influence of the ECR Plasma Confinement on Reducing the Bremsstrahlung production of an ECRIS with MD Configuration", **Rev. Sci. Instrum. 80, 1, p.013303, 2009**	2009	Rev. Sci. Instrum	1,69305	0

647	E15 -A 16-6	DFN	B.Adeva, L.Afanasyev, Y.Allkofer, C.Amsler, A.Anania, A.Benelli, V.Brekhovskikh, **G.Caragheorgheopol**, T.Cechak, M.Chiba, P.Chliapnikov, **C.Ciocarlan, S.Constantinescu, C.Curceanu**, C.Detraz, D.Dreossi, D.Drijard, A.Dudarev, **M.Duma, D.Dumitriu**, J.L.Fungueiriño, J.Gerndt, A.Gorin, O.Gorchakov, K.Gritsay, C.Guaraldo, **M.Gugiu**, M.Hansroul, Z.Hons, S.Horikawa, M.Iliescu, V.Karpukhin, J.Kluson, M.Kobayashi, V.Komarov, V.Kruglov, L.Kruglova, A.Kulikov, A.Kuptsov, I.Kurochkin, A.Lamberto, A.Lanaro, V.Lapshin, R.Lednicky, P.Levi Sandri, A.Lopez Aguerao, V.Lucherini, I.Manuilov, C.Mariñas, L.Nemenov, M.Nikitin, K.Okada, V.Olchevskii, **M.Pentia**, A.Penzo, M.Pló, G.F.Rappazzo, C.Regenfus, J.Rochet, A.Romero, V.Ronjin, A.Ryazantsev, V.Rykalin, J.Saborido, J.Schacher, A.Sidorov, J.Smolik, S.Sugimoto, F.Takeutchi, A.Tarasov, L.Tauscher, T.Trojek, S.Trusov, V.Utkin, O.Vázquez Docee, T.Vrba, V.Yazkov, Y.Yoshimura, M.Zhabitsky, P.Zrelov, "Evidence for pi K atoms with DIRAC", **Phys. Lett. B 674, p.11-16 (2009)**	2009	PHYSICS LETTERS B	3,62428	0
648	E15 -A 16-7	DFN	S.Horikawa, Y.Allkofer, C.Amsler, V.Brekhovskikh, A.Kuptsov, **M.Pentia**, M.Zhabitsky, "The C-4_F-10 Cherenkov detector for DIRAC-II", **Nucl. Instrum. Meth. A 595, p.212-215 (2008)**	2008	NUCL INSTR & METH IN PHYS RES A	1,02286	28
649	E15 -A 16-8	DFN	G. Ciavola, S. Gammino, S. Barbarino, **L.Schachter, S.Dobrescu**, K. Stiebing, "A status report of the multipurpose superconducting electron cyclotron resonance ion source", **Rev. Sci. Instrum. 79, 2, p.02A329, (2008)**	2008	Rev. Sci. Instrum	1,69305	1
650	E15 -A 16-9	DFN	**L.Schachter, S.Dobrescu**, K. E. Stiebing, T. Thuillier, T. Lamy, "The influence of ambipolarity on plasma confinement and on the performance of electron cyclotron ion sources", **Rev. Sci. Instrum. 79, 2, p.02A329, (2008)**	2008	Rev. Sci. Instrum	1,69305	0
651	E16 -A 1	DFH	**A. Petrovici,** K. W. Schmid, and A. Faessler, Beyond mean field approach to the beta decay of medium mass nuclei relevant for nuclear astrophysics, **Prog. Part. Nucl. Phys.**, 66, 287 (2011)	2011	Prog.Part.Nucl.Phys.	2,59787	0
652	E16 -A 2	DFH	**A. Petrovici,** Self-consistent description of coexistence phenomena in medium mass nuclei, **J. Phys. G: Nucl. Part. Phys.**, 37, 064036 (2010)	2010	J PHYS G NUCL PARTIC	1,00000	3
653	E16 -A 3	DFH	**A. Petrovici,** K. W. Schmid, **O. Andrei**, and A. Faessler, Variational approach to the Gamow-Teller beta decay of the rp-process waiting point nucleus 68Se going beyond mean field calculations, **Phys. Rev. C**80, 044319 (2009)	2009	Physical Review C	1,24767	0
654	E16 -A 4	DFH	**A. Petrovici**, K. W. Schmid, **O. Radu,** Amand Faessler, Gamow-Teller beta decay of Kr-74 in a self-consistent approach, **Nuclear Physics A** 799, 94 (2008)	2008	NUCLEAR PHYSICS A	1,09321	0
655	E16 -A 5	DFH	**A. Petrovici,** K.W. Schmid, **O.Radu** and A. Faessler, Self-Consistent Approach to the Gamow-Teller Beta Decay of 72Kr, **Phys. Rev. C**78, 044315 (2008)	2008	Physical Review C	1,24767	2
656	E16 -A 6	DFH	**A. Petrovici**, Self-consistent description of exotic structure and decay near N=Z line **Int. Journal of Modern Physics E**, Vol.17, 219, Supplement (2008)	2008	International Journal of Modern Physics E	0,26099	1
657	E16 -A 7	DFH	**A. Petrovici,** K.W. Schmid, **O. Radu** and Amand Faessler, Structure of A=82 analogs and isospin-symmetry-breaking effects on superallowed Fermi beta decay **Phys. Rev. C**78, 064311 (2008)	2008	Physical Review C	1,24767	7
658	E16 -A 8	DFH	Lombardo, L, Agodi, Alba, R, Amorini, Anzalone, Auditore, **Berceanu I,** Cardella, Cavallaro, Chatterjee, Defilippo, Dipietro, Figuera, Geraci, E, Giuliani, Grassi, Grzeszczuk, Han, J , La Guidara, E , Lanzalone, G, Le	2011	International Journal of Modern Physics E	0,26099	7
659	E16 -A 9	DFH	**ALICE Collaboration**, Production of pions, kaons and protons in pp collisions at sqrt(s)= 900 GeV with ALICE at the LHC, **Eur.Phys.J.C 71(6): 1655**	2011	European Physical Journal C	1,30361	0
660	E16 -A 10	DFH	**ALICE Collaboration,** Higher harmonic anisotropic flow measurements of charged particles in Pb-Pb collisions at 2.76 TeV, **Phys. Rev. Lett.** 107, 032301	2011	PHYSICAL REVIEW LETTERS	7,98625	0
661	E16 -A 11	DFH	**ALICE Collaboration,** Rapidity and transverse momentum dependence of inclusive J/psi production in pp collisions at sqrt(s)=7 TeV, **Phys.Lett. B**704 (2011) 442-455	2011	PHYSICS LETTERS B	3,62428	1
662	E16 -A 12	DFH	**ALICE Collaboration,** Strange particle production in proton-proton collisions at √s = 0.9 TeV with ALICE at the LHC**, Eur. Phys. J. C** 71 (3), 1594	2011	European Physical Journal C	1,30361	2
663	E16 -A 13	DFH	**ALICE Collaboration,** Two-pion Bose-Einstein correlations in central PbPb collisions at sqrt(s_NN) = 2.76 TeV, **Phys.Lett.B** 696 (4): 328-337	2011	PHYSICS LETTERS B	3,62428	5
664	E16 -A 14	DFH	**ALICE Collaboration,** Centrality dependence of the charged-particle multiplicity density at mid-rapidity in Pb-Pb collisions at sqrt(sNN) = 2.76 TeV, **Phys. Rev. Lett.** 106, 032301	2011	PHYSICAL REVIEW LETTERS	7,98625	2
665	E16 -A 15	DFH	**ALICE Collaboration,** Suppression of Charged Particle Production at Large Transverse Momentum in Central Pb-Pb Collisions at √sNN = 2.76 TeV**,** **Phys. Lett. B** 696 (2011) 30-39	2011	PHYSICS LETTERS B	3,62428	27
666	E16 -A 16	DFH	Lombardo I, Agodi C , Alba R, Amorini F, Anzalone A , **Berceanu I** , Cardella G , Cavallaro S , Chatterjee MB, De Filippo E , Di Pietro A , Figuera P , Geraci E, Giuliani G , Grassi L , Grzeszczuk A, Han J , La Guidara E , Lanzalone G , Le Neindre N , Maiolino C (Maiolino, Pagano A , Papa M, Pirrone S , Politi G , **Pop A** , Porto F , Rizzo F , Russotto P , Santonocito D, Verde G, Isospin transport effects in nuclear reactions at 25 MeV/nucleon, **PHYSICAL REVIEW C** Volume: 82 Issue: 1 Article Number: 014608	2010	Physical Review C	1,24767	0
667	E16 -A 17	DFH	I. LOMBARDO, C. AGODI, R. ALBA, F. AMORINI, A. ANZALONE, **I. BERCEANU,** G. CARDELLA, S. CAVALLARO, M. B. CHATTERJEE, R. CONIGLIONE, E. DEFILIPPO, A. DIPIETRO, P. FIGUERA, E. GERACI, G. GIULIANI, L. GRASSI, A. GRZESZCZUK, E. LA GUIDARA, G. LANZALONE, N. LE NEINDRE, C. MAIOLINO, A. PAGANO, M. PAPA, S. PIRRONE, G. POLITI, **A. POP**, F. PORTO, F. RIZZO, P. RUSSOTTO, D. SANTONOCITO, P. SAPIENZA and G. VERDE, DYNAMICAL AND THERMODYNAMICAL PROPERTIES OF INCOMPLETE FUSION EVENTS AT 25 MeV/NUCLEON , (IJMPE) 19(2010)1170	2010	International Journal of Modern Physics E	0,26099	9
668	E16 -A 18	DFH	I.Lombardo, C.Agodi , R.Alba , F.Amorini A.Anzalone **, I.Berceanu** , G.Cardella , S.Cavallaroa , M.B.Chatterjeee , R.Coniglione , E.DeFilippo , A.DiPietro, P.Figuera, E.Geracia, G.Giuliani, L.Grassi , A.Grzeszczuk , E.LaGuidara , G.Lanzalone , N.LeNeindre , C.Maiolino , A.Pagano , M.Papa , S.Pirrone, G.Politi , **A.Pop** , F.Porto , F.Rizzo , P.Russotto , D.Santonocito , P.Sapienza , G.Verde. Isospin dependence of physical observables in Incomplete Fusion reactions at 25 MeV/nucleon, **Nuclear Physics A 834 (2010) 458c-460c**	2010	NUCLEAR PHYSICS A	1,09321	15

669	E16 -A 19	DFH	P. Russotto, E. De Filippo, A. Pagano, E. Piasecki, F. Amorini, A. Anzalone, L. Auditore, V. Baran, **I. Berceanu,** J. Blicharska, B. Borderie, R. Bougault, M. Bruno, J. Brzychczyk, G. Cardella, S. Cavallaro, M. B. Chatterjee, A. Chbihi, M. Colonna, M. Dâ€™Agostino, R. Dayras, M. Di Toro, J. Frankland, E. Galichet, W. Gawlikowicz, E. Geraci, F. Giustolisi, A. Grzeszczuk, P. Guazzoni, D. Guinet, S. Kowalski, E. La Guidara, G. Lanzalone, G. Lanzan`o, N. Le Neindre, C. Maiolino, Z. Majka, M. Papa, **M. Petrovici**, S. Pirrone, R. PÅ‚aneta, G. Politi, **A. Pop**, F. Porto, M. F. Rivet, F. Rizzo, E. Rosato, K. Schmidt, K. Siwek-Wilczynska, I. Skwira-Chalot, A. Trïï¬ro , M. Trimarchi, M. Vigilante, J. P. Wieleczko, J. Wilczynski, L. Zetta, and W. Zipper, Strong enhancement of dynamical emission of heavy fragments in the neutron-rich 124 Sn + 64 Ni reaction at 35 A MeV, **PHYSICAL REVIEW C** 81, 064605	2010	Physical Review C	1,24767	0
670	E16 -A 20	DFH	Javier Castillo (for the **ALICE Collaboration**) (lista completa de autori in J. Phys. G.:Nucl. Part. Phys. 37(2010)099801 (8pp)), Measurements of quarkonium production with ALICE at the LHC, **J. Phys. G: Nucl. Part. Phys**. 37 (2010) 094051	2010	J PHYS G NUCL PARTIC	1,00000	0
671	E16 -A 21	DFH	J D Tapia Takaki (for the **ALICE Collaboration**)lista completa de autori in J. Phys. G.:Nucl. Part. Phys. 37(2010)099801 (8pp)), The colour glass condensate framework in p+p and Pb+p interactions at the ALICE experiment, **J. Phys. G: Nucl. Part. Phys**. 37 (2010) 094050	2010	J PHYS G NUCL PARTIC	1,00000	32
672	E16 -A 22	DFH	Helene Ricaud , Alexander Kalweit and Antonin Maire (for the **ALICE Collaboration**)lista completa de autori in J. Phys. G.:Nucl. Part. Phys. 37(2010)099801 (8pp)), Study of strange particle production in pp collisions with the ALICE detector **J. Phys. G: Nucl. Part. Phys. 37 (2010) 094049**	2010	J PHYS G NUCL PARTIC	1,00000	0
673	E16 -A 23	DFH	Z L Matthews (for the **ALICE Collaboration**)lista completa de autori in J. Phys. G.:Nucl. Part. Phys. 37(2010)099801 (8pp)), Strangeness in high multiplicity protonâ€“proton collisions in the ALICE experiment, **J. Phys. G: Nucl. Part. Phys. 37 (2010) 094048**	2010	J PHYS G NUCL PARTIC	1,00000	0
674	E16 -A 24	DFH	A Badala, R Barbera, P La Rocca, G S Pappalardo, C Petta A Pulvirenti and F Riggi (for the **ALICE Collaboration**3)(lista completa de autori in J. Phys. G.:Nucl. Part. Phys. 37(2010)099801 (8pp)), Study of hadronic resonances in ALICE in a first physics scenario**, J. Phys. G: Nucl. Part. Phys. 37 (2010) 094047**	2010	J PHYS G NUCL PARTIC	1,00000	0
675	E16 -A 25	DFH	Iouri Belikov (for the **ALICE Collaboration)** (lista completa de autori in J. Phys. G.:Nucl. Part. Phys. 37(2010)099801 (8pp)), Strangeness and heavy flavours within th e ALICE experiment**, J. Phys. G: Nucl. Part. Phys. 37 (2010) 094020**	2010	J PHYS G NUCL PARTIC	1,00000	0
676	E16 -A 26	DFH	**ALICE Collaboration**, First proton-proton collisions at the LHC as observed with the ALICE detector: measurement of the charged-particle pseudorapidity density at sqrt(s)=900 GeV, **Eur. Pjys. Jour. C (2010) 65:111**	2010	European Physical Journal C	1,30361	56
677	E16 -A 27	DFH	**ALICE Collaboration**, Alignment of the ALICE Inner Tracking System with cosmic-ray tracks, **J. Instrum. 5, P03003 (2010)**	2010	Journal of Instrumentation	2,12230	5
678	E16 -A 28	DFH	**ALICE Collaboration**, Charged-particle multiplicity measurement in proton-proton collisions at sqrt(s)=0.9 and 2.36 TeV with ALICE at LHC, **Eur. Phys. J. C (2010) 68: 89108**	2010	European Physical Journal C	1,30361	24
679	E16 -A 29	DFH	**ALICE Collaboration**, Charged-particle multiplicity measurement in proton-proton collisions at sqrt(s)=7 TeV with ALICE at LHC, **Eur. Phys. J. C (2010) 68: 345354**	2010	European Physical Journal C	1,30361	31
680	E16 -A 30	DFH	**ALICE Collaboration**, Midrapidity Antiproton-to-Proton Ratio in pp Collisons at sqrt(s)=0.9 and 7 TeV Measured by the ALICE Experiment, **Phys Rev Lett Vol.105, No.7, (2010)**	2010	PHYSICAL REVIEW LETTERS	7,98625	76
681	E16 -A 31	DFH	**ALICE Collaboration**, Two-pion Bose-Einstein correlations in pp collisions at sqrt(s)=900 GeV, **Phys. Rev. D 82, 052001 (2010)**	2010	Phys Rev D	1,67198	0
682	E16 -A 32	DFH	**ALICE Collaboration**, Transverse momentum spectra of charged particles in proton-proton collisions at sqrt(s)=900 GeV with ALICE at the LHC, **Physics Letters B 693 (2010) 5368**	2010	PHYSICS LETTERS B	3,62428	3
683	E16 -A 33	DFH	**ALICE Collaboration**, Charged-particle multiplicity density at mid-rapidity in central Pb-Pb collisions at sqrt(sNN) = 2.76 TeV, Phys. Rev. Lett. 105, 252301(2010)	2010	PHYSICAL REVIEW LETTERS	7,98625	76
684	E16 -A 34	DFH	**ALICE Collaboration**, Elliptic flow of charged particles in Pb-Pb collisions at 2.76 TeV , **Phys. Rev. Lett., 105, 252302 (2010)**	2010	PHYSICAL REVIEW LETTERS	7,98625	147
685	E16 -A 35	DFH	G E Bruno for the **ALICE Collaboration** (lista completa de autori e listata in: J. Phys. G: Nucl. Part. Phys. 36 (2009) , Heavy flavours in ALICE, **J. Phys. G: Nucl. Part. Phys. 36 (2009) 064053**	2009	J PHYS G NUCL PARTIC	1,00000	1
686	E16 -A 36	DFH	Andrea Dainese, for the **ALICE Collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 91992, Preparation for heavy-flavour measurements with ALICE at the LHC, **Nuclear Physics A 830 (2009) 769c-772c**	2009	NUCLEAR PHYSICS A	1,09321	4
687	E16 -A 37	DFH	G. Volpe for the **ALICE collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 91992, Results from cosmics and first LHC beam with the ALICE HMPID detector, **Nuclear Physics A 830 (2009) 539c-542c**	2009	NUCLEAR PHYSICS A	1,09321	5
688	E16 -A 38	DFH	MinJung Kweon for the **ALICE Collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 91992, The Transition Radiation Detector for ALICE at LHC, **Nuclear Physics A 830 (2009) 535c-538c**	2009	NUCLEAR PHYSICS A	1,09321	1
689	E16 -A 39	DFH	Francesco Prino for the **ALICE collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 919924, Results from the commissioning of the ALICE Inner Tracking System with cosmics,	2009	NUCLEAR PHYSICS A	1,09321	3
690	E16 -A 40	DFH	Yuri Kharlova for the **ALICE collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 919924c, Photon Physics in ALICE, **Nuclear Physics A 830 (2009) 495c-498c**	2009	NUCLEAR PHYSICS A	1,09321	0
691	E16 -A 41	DFH	Magdalena Maleka for the **ALICE collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 919924c,Quarkonia measurements with ALICE at the LHC , **Nuclear Physics A 830 (2009) 339c-342c**	2009	NUCLEAR PHYSICS A	1,09321	0
692	E16 -A 42	DFH	P.G. Kuijer, for the **ALICE collaboration** (lista completa de autori e listata in: Nuclear Physics A 830 (2009) 919924c, Commissioning and Prospects for Early Physics with ALICE,	2009	NUCLEAR PHYSICS A	1,09321	16
693	E16 -A 43	DFH	F.Amorini, G.Cardella, G.Giuliani, M.Papa, C.Agodi, R.Alba, A.Anzalone, **I.Berceanu**,S.Cavallaro, M.B.Chatterjee, R.Coniglione, E.De Filippo, A.Di Pietro, E.Geraci, L.Grassi,A.Grzeszczuk, P.Figuera, E.La Guidara, G.Lanzalone, N.Le Neindre, I.Lombardo,C.Maiolino, A.Pagano, S.Pirrone, G.Politi, **A.Pop,** F.Porto, F.Rizzo, P.Russotto,D.Santonocito, P.Sapienza, G.Verde, ISOSPIN DEPENDENCE OF INCOMPLETE FUSION REACTIONS AT 25 MEV/A, **Physical Review Letters vol. 102 (2009) issue 11, 112701**	2009	PHYSICAL REVIEW LETTERS	7,98625	5

694	E16 -A 44	DFH	De Filippo E, Amorini F, Anzalone A, Auditore L, Baran V, **Berceanu I,** Blicharska J, Borderie B, Bougault R, Bruno M, Brzychczyk J, Cardella G, Cavallaro S, Chaterjee MB, Chbihi A, Colonna M, DAgostino M , Dayras R , Di Toro M, Emanuele U , Frankland J , Galichet E, Gawlikowicz W , Geraci E , Giustolisi F, Grassi, Grzeszczuk A , Guazzoni P, Guinet D , Kowalski S, La Guidara E, Lanzalone G , Lanzano G , Le Neindre N , Lombardo I , Maiolino C , Majka Z, Pagano A, Papa M, **Petrovici M** , Piasecki E, Pirrone S , Planeta R , Politi G**, Pop A** , Porto F , Rivet MF, Rosato E, Rizzo F , Russotto P, Schmidt K, Siwek-Wilczynska K, Skwira I, Sochocka A, Trifiro A , Trimarchi M , Verde G , Vigilante M , Wieleczko JP , Wilczynski J , Zetta L, Zipper W , DYNAMICAL SIGNALS IN FRAGMENTATION REACTIONS: TIME SCALE DETERMINATION FROM THREE FRAGMENTS CORRELATIONS BY USING THE 4 pi CHIMERA MULTIDETECTOR, **ACTA PHYSICA POLONICA B Volume: 40 (2009)**	2009	ACTA PHYS POL B	0,55670	0
695	E16 -A 45	DFH	A Morsch (on behalf of the **ALICE Collaboration(**full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 109801 (8pp)), Jet and gamma-jet physics with ALICE, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 104167**	2008	J PHYS G NUCL PARTIC	1,00000	1
696	E16 -A 46	DFH	Sudhir Raniwala (for the **ALICE Collaboration(**full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 109801 (8pp)), Anisotropic flow measurements in ALICE, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 104165**	2008	J PHYS G NUCL PARTIC	1,00000	0
697	E16 -A 47	DFH	C Hohne (for the **CBM Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 109803 (5pp)), Di-lepton spectroscopy in CBM, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 104160**	2008	J PHYS G NUCL PARTIC	1,00000	0
698	E16 -A 48	DFH	B Espagnon (for the **ALICE Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 109801 (8pp)) , The ALICE muon spectrometer and related physics, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 104145**	2008	J PHYS G NUCL PARTIC	1,00000	0
699	E16 -A 49	DFH	Massimo Masera (for the **ALICE Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 109801 (8pp)), Heavy flavour physics in ALICE, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 104144**	2008	J PHYS G NUCL PARTIC	1,00000	4
700	E16 -A 50	DFH	Subhasis Chattopadhyay (for the **CBM Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 109803 (5pp)), Physics at high baryon density at FAIR , **J. Phys. G: Nucl. Part. Phys. 35 (2008) 104027**	2008	J PHYS G NUCL PARTIC	1,00000	3
701	E16 -A 51	DFH	Paraskevi Ganoti (for the **ALICE Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 049801 (9pp)), Study of Lambda(1520) production in pp simulated interactions at 14 TeV with the ALICE detector, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 044059**	2008	J PHYS G NUCL PARTIC	1,00000	4
702	E16 -A 52	DFH	J. D. Tapia Takaki (for the **ALICE Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 049801 (9pp)), Prospects for Phi meson production in pp collisions at the ALICE experiment , **J. Phys. G: Nucl. Part. Phys. 35 (2008) 044058**	2008	J PHYS G NUCL PARTIC	1,00000	1
703	E16 -A 53	DFH	Julien Faivre (for the **ALICE Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 049801 (9pp)), Study of the ALICE performance for the measurement of beauty production**, J. Phys. G: Nucl. Part. Phys. 35 (2008) 044047**	2008	J PHYS G NUCL PARTIC	1,00000	1
704	E16 -A 54	DFH	Christian Kuhn (for the **ALICE Collaboration(**full author list in J. Phys. G: Nucl. Part. Phys. 35 (2008) 049801 (9pp)), Soft physics in ALICE, **J. Phys. G: Nucl. Part. Phys. 35 (2008) 044044**	2008	J PHYS G NUCL PARTIC	1,00000	0
705	E16 -A 55	DFH	**ALICE Collaboration**, The ALICE experiment at the CERN LHC , **Journal of Instrumentation, Volume 3, Number 08, JINST 3 S08002(August 2008)**	2008	Journal of Instrumentation	2,12230	76
706	E16 -A 56	DFH	R. Planeta, F. Amorini, A. Anzalone, L. Auditore, V. Baran, A. Benisz, **I. Berceanu**, A. Bonasera, B. Borderie, J. Borgensztajn, R. Bougault, M. Bruno, J. Brzychczyk, G. Cardella, S. Cavallaro, M. B. Chatterjee, A. Chbihi, M. Colonna, M. D-Agostino, R. Dayras, E. De Filippo, M. Di Toro,	2008	Physical Review C	1,24767	9
707	E16 -A 57	DFH	M. Papa, F. Amorini, A. Anzalone, L. Auditore, V. Baran, **I. Berceanu,** J. Blicharska, J. Brzychczyk, A. Bonasera, B. Borderie, R. Bougault, G. Cardella, S. Cavallaro, M. B. Chatterjee, A. Chbihi, M. Colonna, R. Dayras, E. De Filippo, M. Di Toro, J. Frankland, E. Galichet, W. Gawlikowicz, E. Geraci, G. Giuliani, F. Giustolisi, A. Grzeszczuk, P. Guazzoni, D. Guinet, M. Iacono-Manno, S. Kowalski, E. La Guidara, G. Lanzalone, G. LanzanÃ², C. Maiolino, Z. Majka, N. Le Neindre, A. Pagano, **M. Petrovici**, E. Piasecki, S. Pirrone, R. Planeta, G. Politi, **A. Pop**, F. Porto, F. Rizzo, E. Rosato, S. Russo, P. Russotto, M. Sassi, K. Schmidt, K. Siwek-WilczyÅ„ska, I. Skwira, A. Sochocka, L. Åšwiderski, A. TrifirÃ², M. Trimarchi, G. Vannini, G. Verde, M. Vigilante, J. P. Wieleczko, J. WilczyÅ„ski, L. Zetta, and W. Zipper, Dynamical multi-breakup processes in the 124Sn+64Ni system at 35 MeV/nucleon, **Phys. Rev. C 75, 054616 (2007)**	2008	Physical Review C	1,24767	4
708	E16 -A 58	DFH	WOLFGANG SOMMER, CHRISTOPH BLUME and FREDERICK KRAMER, JAN FIETE GROSSE-OETRINGHAUS (for the **ALICE Collaboration,** (full author list in International Journal of Modern Physics E, Vol. 16, No. 7 & 8 (2007) xlii-lxii)), QUARKONIA MEASUREMENTS WITH THE CENTRAL DETECTORS OF ALICE, **International Journal of Modern Physics E, Vol. 16, Nos. 7 & 8 (2007) 2484-2490**	2007	International Journal of Modern Physics E	0,26099	3
709	E16 -A 59	DFH	Elena Bruna (for the **ALICE Collaboration** (full author list in International Journal of Modern Physics E, Vol. 16, No. 7 & 8 (2007) xlii-lxii)), OPEN CHARM RECONSTRUCTION IN ALICE: D+-->K-pi+pi+ , **International Journal of Modern Physics E, Vol. 16, No. 7 & 8 (2007) 2097-2102**	2007	International Journal of Modern Physics E	0,26099	1
710	E16 -A 60	DFH	Gines Martinez Garcia (for the **ALICE Collaboration**(full author list in J. Phys. G: Nucl. Part. Phys. 34 (2007) S1153-S1161)), ALICE potential for heavy-flavour physics, **J. Phys. G: Nucl. Part. Phys. 34 (2007) S943-S946**	2007	J PHYS G NUCL PARTIC	1,00000	4
711	E16 -A 61	DFH	Tapan K. Nayak (for the **ALICE Collaboration(**full author list in J. Phys. G:Nucl. Part. Phys. 34 (2007) S1153-S1161)), Proton-proton physics in ALICE, **J. Phys. G: Nucl. Part. Phys. 34 (2007) S783-S787**	2007	J PHYS G NUCL PARTIC	1,00000	2
712	E16 -A 62	DFH	D. C. Zhou (for the **ALICE Collaboration** (full author list in J. Phys. G: Nucl. Part. Phys. 34 (2007) S1153-S1161)), PHOS, the ALICE-PHOton spectrometer, **J. Phys. G: Nucl. Part. Phys. 34 (2007) S719-S723**	2007	J PHYS G NUCL PARTIC	1,00000	2
713	E16 -A 63	DFH	Federico Antinori (for the **ALICE Collaboration** (full author list in J. Phys. G: Nucl. Part. Phys. 34 (2007) S1153-S1161)), Heavy-ion physics with ALICE, **J. Phys. G: Nucl. Part. Phys. 34 (2007) S511-S518**	2007	J. Phys. G: Nucl. Part. Phys.	1,00000	4
714	E16 -A 64	DFH	**M.D. Cozma**, Neutron-proton elliptic flow difference as a probe for the high density dependence of the symmetry energy, **Physics Letters B700 (2011) 139-144**	2011	PHYSICS LETTERS B	3,62428	3
715	E16 -A 65	DFH	**M.D. Cozma** and M. Petrovici, Dependence of flow observables in heavy-ion collisions on the symmetry energy and the in-medium nucleon-nucleon interaction, **Prog.Part.Nucl.Phys.62 (2009), 419**	2009	Prog.Part.Nucl.Phys.	2,59787	5

716	E16 -A 66	DFH	E. Santini, **M.D. Cozma**, A. Faessler, C. Fuchs, M.I. Krivoruchenko, and B.M. Martemyanov, Dilepton production at intermediate energies with in-medium spectral functions of vector mesons, **Prog.Part.Nucl.Phys. 62 (2009), 479**	2009	Prog.Part.Nucl.Phys.	2,59787	0
717	E16 -A 67	DFH	E. Santini, **M.D. Cozma**, A. Faessler, C. Fuch, M.I. Krivorucenko and B. Martemyanov, Dilepton production in heavy-ion collisions with in-medium spectral functions of vector mesons, **Physical Review C, Volume 78, 034910, 2008**	2008	Physical Review C	1,24767	1
718	E16 -A 68	DFH	**M.D. Cozma**, O. Scholten, R.G.E. Timmermans and J.A. Tjon, Two-pion exchange contributions to the relativistic NN kernel: Peripheral scattering, **Physical Review C, Volume 75, 014006 (2007)**	2007	Physical Review C	1,24767	2
719	E17 -A 69	DFH	I. Deppner, N. Herrmann, D. Gonzalez-Diaz, V. Ammosov, J. Cheng, M. Ciobanu, V. Gapienko, K.D. Hildenbrand, A. Kiseleva, M. Kis, D. Kresan, R. Kotte, C. Huangshan, Y. Leifels, J. Fruehauf, C. Li, Y. Li, P.-A. Loizeau, L. Naumann, **M. Petrovici, M. Petris**, A. Semak, **V. Simion**, D. Stach, Y. Sun, Yu. Sviridov, Z. Tang, E. Usenko, J. Wang, Y. Wang, K. Wisniewski, J. Wuenstenfeld, L. Xu, V. Zaets, Y. Zhang, X.Zhu, The CBM time-of-flight wall , **Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment,** In Press, Corrected Proof, Available online 7 October 2010	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
720	E17 -A 70	DFH	**M. Petris, M. Petrovici, V. Simion, D. Bartos, G. Caragheorgheopol,** I. Deppner, K. Doroud, N. Herrmann, M. Kiss, P. Loizeau, Y. Zhang, M.C.S. Williams,Toward a high granularity and high counting rate, differential readout timing MRPC , **Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipmen**t, In Press, Corrected Proof, Available online 28 October 2010	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
721	E17 -A 74	DFH	Pawel Staszel for the **CBM Collaboration**, CBM experiment at FAIR, **Acta Physica Polonica B**41, 341 (2010)	2010	ACTA PHYS POL B	0,55670	0
722	E17 -A 75	DFH	M. Heuser for **CBM Collaboration**, The Compressed Baryonic Matter Experiment at FAIR: Progress with feasibility studies and detector developments, **Nucl. Phys. A** 830, 563c-566c (2009)	2009	NUCLEAR PHYSICS A	1,09321	9
723	E17 -A 76	DFH	C Hoehne for the **CBM Collaboration,** Di-lepton spectroscopy in CBM, **J. Phys. G: Nucl. Part. Phys.** 35, 104160 (2008)	2008	J PHYS G NUCL PARTIC	1,00000	2
724	E17 -A 77	DFH	Subhasis Chattopadhyay for the **CBM Collaboration,** Physics at high baryon density at FAIR, **J. Phys. G: Nucl. Part. Phys.** 35, 104027 (2008)	2008	J PHYS G NUCL PARTIC	1,00000	2
725	E17 -A 78	DFH	M. Klein-Boesing, A. Andronic, **D. Bartos, I. Berceanu, V. Catanescu**, C. Garabatos, N. Heine, **A. Herghelegiu**, **C. Magureanu**, D. Moisa, **M. Petris, M. Petrovici, A. Radu, V. Simion,** F. Uhlig, J.P. Wessels, A Wilk, Position resolution of a high efficiency Transition Radiation Detector for high counting rate environment, **Nuclear Instruments and Methods in Physics Research A** , 585, 83-87 (2008)	2008	NUCL INSTR & METH IN PHYS RES A	1,02286	11
726	E17 -A 79	DFH	**M. Petrovici, M. Petris, I. Berceanu, V. Simion, D. Bartos, V. Catanescu, A. Herghelegiu,** C. Magureanu, D. Moisa, **A. Radu,** M. Klein-Boesing, J.P. Wessels, A. Wilk, A. Andronic, C. Garabatos, R. Simon, F. Uhlig , A high-efficiency Transition Radiation Detector for high-counting-rate environments, **Nuclear Instruments and Methods in Physics Research A** 579, 961-966 (2007)	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	2
727	E17 -A 80	DFH	**M. Petris, M. Petrovici, V. Simion, I. Berceanu,** D. Moisa, High counting rate transition radiation detector, **Nuclear Instruments and Methods in Physics Research A** 581, 406 - 409 (2007)	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	0
728	E19 -A 105	DPETI	G.Aad, …, **C.Alexa, F.Badescu, V.Boldea,S.I.Buda, I.Caprini, M.Caprini, M.Ciubancan, S.Constantinescu, C-M. Cuciuc, P.Dita, S.Dita, L.Micu, D.Pantea, G.A.Popeneciu, M.Rotaru, G.Stoicea**, et al (ATLAS Collab), Search for the Higgs Boson in the H→WW→lvjj Decay Channel in pp Collisions at √s=7 TeV with the ATLAS Detector, Physical Review Letters Vol 107, Art No 231801, 2011	2011	Physical Review Letters	7,98625	0
729	E19 -A 106	DPETI	ATLAS Collaboration: G.Aad,…., **C.Alexa, F.Badescu, V.Boldea,S.I.Buda, I.Caprini, M.Caprini, M.Ciubancan, S.Constantinescu, C-M. Cuciuc, P.Dita, S.Dita, L.Micu, D.Pantea, G.A.Popeneciu, M.Rotaru, G.Stoicea**, et al, Measurement of the inclusive isolated prompt photon cross-section in pp collisions at View the MathML source using 35 pb−1 of ATLAS data, Physics Letters B Volume 706, Issues 2-3, 6 December 2011, Pages 150-167	2011	Physics Letters B	3,62	0
730	E19 -A 100	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, A search for new physics in dijet mass and angular distributions in pp collisions at √s=7 TeV measured with the ATLAS detector, NEW JOURNAL OF PHYSICS Volume: 13 Article Number: 053044 Published: MAY 24 2011	2011	NEW JOURNAL OF PHYSICS	4,60710	35
731	E19 -A 101	DPETI	G. Aad, ..., **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurement of the top quark-pair production cross section with ATLAS in pp collisions at root s=7 TeV, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 3 Article Number: 1577 Published: MAR 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	2
732	E19 -A 103	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, S.I. Buda, I. Caprini, M. Caprini, C. Caramarcu, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of the Upsilon(1S) Production Cross-Section in pp Collisions at √s = 7 TeV in ATLAS, PHYSICS LETTERS B 705, 9–27, 1 OCT 2011	2011	PHYSICS LETTERS B	3,62428	0
733	E19 -A 104	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for a heavy gauge boson decaying to a charged lepton and a neutrino in 1 fb-1 of pp collisions at √s = 7 TeV using the ATLAS detector, PHYSICS LETTERS B 705, 28–46, 1 OCT 2011	2011	PHYSICS LETTERS B	3,62428	0
734	E19 -A 35	DPETI	B. Alessandro, **C. Alexa, V. Boldea, S. Constantinescu, S. Dita**, et al., NA50 Collaboration, psi' production in Pb-Pb collisions at 158 GeV/nucleon, EUROPEAN PHYSICAL JOURNAL, Vol. C49, Issue: 2, Pages: 559-567, 2007	2007	EUROPEAN PHYSICAL JOURNAL C	1,30361	0
735	E19 -A 36	DPETI	D. Jouan and the NA50 Collaboration (..., **C. Alexa, V. Boldea, S. Constantinescu, S. Dita**, et al.), φ and ω − ρ production in d–C, d–U, S–U and Pb–Pb at SPS energies, JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS, Vol.35, 104-163, 2008	2008	J PHYS G NUCL PARTIC	1,00000	0
736	E19 -A 37	DPETI	F. Prino,..., **C. Alexa, V. Boldea, S. Constantinescu, S. Dita**, et al., NA50 Collaboration, J/psi azimuthal anisotropy relative to the reaction plane in Pb-Pb collisions at 158 GeV per nucleon, EUROPEAN PHYSICAL JOURNAL C Volume: 61 Issue: 4 Pages: 853-858 Published: JUN 2009	2009	EUROPEAN PHYSICAL JOURNAL C	1,30361	5
737	E19 -A 47	DPETI	G.Aad,..., **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, C. Caramarcu, D. Chesneanu, M. Ciubancan, S. Constantinescu, P. Dita, S. Dita, C. Gruse, L. Micu, M. Niculescu, D. Pantea, T. Preda, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, The ATLAS Experiment at the CERN Large Hadron Collider, JOURNAL OF INSTRUMENTATION, Volume: 3 Article Number: S08003 Published: AUG 2008	2008	Journal of Instrumentation	2,12230	2

738	E19 -A 48	DPETI	M. Baker and the ATLAS Collaboration (G.Aad,…, **D. Chesneanu, S. Constantinescu,** et al.), Direct gamma and gamma-jet measurement capability of ATLAS for Pb plus Pb Collisions, NUCLEAR PHYSICS A, Vol. 830, Pages:499c - 502c, 2009	2009	NUCLEAR PHYSICS A	1,09321	6
739	E19 -A 49	DPETI	N. Grau and the ATLAS Collaboration (G. Aad,…, **D. Chesneanu, S. Constantinescu**, et al.), Elucidating Jet Energy Loss Using Jets: Prospects from ATLAS, Nuclear Physics A Volume:830 Pages: 797c-800c Published 2009	2009	NUCLEAR PHYSICS A	1,09321	0
740	E19 -A 50	DPETI	P. Adragna, **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Tilecal & Trigger DAQ Collaboration, Testbeam studies of production modules of the ATLAS Tile Calorimeter, NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 606 Issue: 3 Pages: 362-394 Published JUL 2009	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	5
741	E19 -A 51	DPETI	E. Abat,..., **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Tilecal & Trigger DAQ Collaboration, Study of the response of the ATLAS central calorimeter to pions of energies from 3 to 9 GeV, NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 607 Issue: 2 Pages: 372-386 Published: AUG 11 2009	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	2
742	E19 -A 52	DPETI	J. Dolejsi and the ATLAS Collaboration (G. Aad,…, **D. Chesneanu, S. Constantinescu**, et al.), Status of ATLAS and Preparation for the Pb-Pb Run, NUCLEAR PHYSICS A, Volume:830, Pages:89c-96c Published: NOV 2009	2009	NUCLEAR PHYSICS A	1,09321	19
743	E19 -A 53	DPETI	P. Adragna,..., **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Tilecal Collaboration, Measurement of pion and proton response and longitudinal shower profiles up to 20 nuclear interaction lengths with the ATLAS Tile calorimeter, NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 615 Issue: 2 Pages: 158-181 Published: APR 1 2010	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	10
744	E19 -A 54	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D.Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Charged-particle multiplicities in pp interactions at √s=900 GeV measured with the ATLAS detector at the LHC ATLAS Collaboration, PHYSICS LETTERS B Volume: 688 Issue: 1 Pages: 21-42 Published: APR 26 2010	2010	PHYSICS LETTERS B	3,62428	2
745	E19 -A 55	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Performance of the ATLAS detector using first collision data, JOURNAL OF HIGH ENERGY PHYSICS Issue: 9 Article Number: 056 Published: SEP 2010	2010	J HIGH ENERGY PHYS	1,67711	0
746	E19 -A 56	DPETI	E. Abata,..., **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Study of energy response and resolution of the ATLAS barrel calorimeter to hadrons of energies from 20 to 350 GeV, NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 621 Issue: 1-3 Pages: 134-150 Published: SEP 2010 Volume: 621 Issue: 1-3 Pages: 134-150 Published: SEP 2010	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	16
747	E19 -A 57	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru**, et al., ATLAS Collaboration, Search for New Particles in Two-Jet Final States in 7 TeV Proton-Proton Collisions with the ATLAS Detector at the LHC, PHYSICAL REVIEW LETTERS Volume: 105 Issue: 16 Article Number: 161801 Published: OCT 11 2010	2010	PHYSICAL REVIEW LETTERS	7,98625	0
748	E19 -A 58	DPETI	E. Abat,..., **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Combined performance studies for electrons at the 2004 ATLAS combined test-beam, JOURNAL OF INSTRUMENTATION Volume: 5 Article Number: P11006 Published: NOV 2010	2010	Journal of Instrumentation	2,12230	6
749	E19 -A 59	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Observation of a Centrality-Dependent Dijet Asymmetry in Lead-Lead Collisions at √s(NN)=2.76 TeV with the ATLAS Detector at the LHC, PHYSICAL REVIEW LETTERS Volume: 105 Issue: 25 Article Number: 252303 Published: DEC 13 2010	2010	PHYSICAL REVIEW LETTERS	7,98625	0
750	E19 -A 60	DPETI	G. Aad,…, **C. Alexa, V. Boldea, M. Caprini, D. Chesneanu, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Readiness of the ATLAS Tile Calorimeter for LHC collisions, EUROPEAN PHYSICAL JOURNAL C Volume: 70 Issue: 4 Pages: 1193-1236 Published: DEC 2010	2010	EUROPEAN PHYSICAL JOURNAL C	1,30361	2
751	E19 -A 61	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Readiness of the ATLAS liquid argon calorimeter for LHC collisions, EUROPEAN PHYSICAL JOURNAL C Volume: 70 Issue: 3 Pages: 723-753 Published: DEC 2010	2010	EUROPEAN PHYSICAL JOURNAL C	1,30361	2
752	E19 -A 62	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Drift Time Measurement in the ATLAS Liquid Argon Electromagnetic Calorimeter using Cosmic Muons, EUROPEAN PHYSICAL JOURNAL C Volume: 70 Issue: 3 Pages: 755-785 Published: DEC 2010	2010	EUROPEAN PHYSICAL JOURNAL C	1,30361	1
753	E19 -A 63	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, D. Pantea**, et al., ATLAS Collaboration, The ATLAS Inner Detector commissioning and calibration, EUROPEAN PHYSICAL JOURNAL C Volume: 70 Issue: 3 Pages: 787-821 Published: DEC 2010	2010	EUROPEAN PHYSICAL JOURNAL C	1,30361	3
754	E19 -A 64	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, D. Pantea**, et al., ATLAS Collaboration, The ATLAS Simulation Infrastructure, EUROPEAN PHYSICAL JOURNAL C Volume: 70 Issue: 3 Pages: 823-874 Published: DEC 2010	2010	EUROPEAN PHYSICAL JOURNAL C	1,30361	0
755	E19 -A 65	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Commissioning of the ATLAS Muon Spectrometer with cosmic rays, EUROPEAN PHYSICAL JOURNAL C Volume: 70 Issue: 3 Pages: 875-916 Published: DEC 2010	2010	EUROPEAN PHYSICAL JOURNAL C	1,30361	4
756	E19 -A 66	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Search for quark contact interactions in dijet angular distributions in pp collisions at √s=7 TeV measured with the ATLAS detector, PHYSICS LETTERS B, Volume: 694, Issue: 4-5, Pages: 327-345 Published: JAN 3 2011	2011	PHYSICS LETTERS B	3,62428	0
757	E19 -A 67	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Charged-particle multiplicities in pp interactions measured with the ATLAS detector at the LHC, NEW JOURNAL OF PHYSICS Volume: 13 Article Number: 053033 Published: MAY 19 2011	2011	NEW JOURNAL OF PHYSICS	4,60710	0
758	E19 -A 68	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for Heavy Long-Lived Charged Particles with the ATLAS detector in pp collisions at √s = 7 TeV, PHYSICS LETTERS B 703 (2011) 428-446	2011	PHYSICS LETTERS B	3,62428	1
759	E19 -A 69	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for supersymmetry in pp collisions at √s=7 TeV in final states with missing transverse momentum and b-jets, PHYSICS LETTERS B Volume: 701 Issue: 4 Pages: 398-416 Published: JUL 18 2011	2011	PHYSICS LETTERS B	3,62428	0

760	E19 -A 70	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for squarks and gluinos using final states with jets and missing transverse momentum with the ATLAS detector in √s=7 TeV proton-proton collisions, PHYSICS LETTERS B Volume: 701 Issue: 2 Pages: 186-203 Published: JUL 4 2011	2011	PHYSICS LETTERS B	3,62428	0
761	E19 -A 71	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for stable hadronising squarks and gluinos with the ATLAS experiment at the LHC, PHYSICS LETTERS B Volume: 701 Issue: 1 Pages: 1-19 Published: JUN 27 2011	2011	PHYSICS LETTERS B	3,62428	0
762	E19 -A 72	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of the W charge asymmetry in the W -> mu nu decay mode in pp collisions at √s=7 TeV with the ATLAS detector, PHYSICS LETTERS B Volume: 701 Issue: 1 Pages: 31-49 Published: JUN 27 2011	2011	PHYSICS LETTERS B	3,62428	4
763	E19 -A 73	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for high-mass states with one lepton plus missing transverse momentum in proton-proton collisions √s=7 TeV with the ATLAS detector , PHYSICS LETTERS B Volume: 701 Issue: 1 Pages: 50-69 Published: JUN 27 2011	2011	PHYSICS LETTERS B	3,62428	0
764	E19 -A 74	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of the W(+)W(-) Cross Section in √s = 7 TeV pp Collisions with ATLAS, PHYSICAL REVIEW LETTERS Volume: 107 Issue: 4 Article Number: 041802 Published: JUL 20 2011	2011	PHYSICAL REVIEW LETTERS	7,98625	0
765	E19 -A 75	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurement of the production cross section for W-bosons in association with jets in pp collisions at √s=7 TeV with the ATLAS detector, PHYSICS LETTERS B Volume: 698 Issue: 5 Pages: 325-345 Published: APR 25 2011	2011	PHYSICS LETTERS B	3,62428	3
766	E19 -A 76	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Search for massive long-lived highly ionising particles with the ATLAS detector at the LHC, PHYSICS LETTERS B Volume: 698 Issue: 5 Pages: 353-370 Published: APR 25 2011	2011	PHYSICS LETTERS B	3,62428	2
767	E19 -A 77	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurement of the centrality dependence of J/psi yields and observation of Z production in lead-lead collisions with the ATLAS detector at the LHC, PHYSICS LETTERS B Volume: 697 Issue: 4 Pages: 294-312 Published: MAR 14 2011	2011	PHYSICS LETTERS B	3,62428	0
768	E19 -A 78	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for a Heavy Particle Decaying into an Electron and a Muon with the ATLAS Detector in √s=7 TeV pp collisions at the LHC, PHYSICAL REVIEW LETTERS Volume: 106 Issue: 25 Article Number: 251801 Published: JUN 22 2011	2011	PHYSICAL REVIEW LETTERS	7,98625	0
769	E19 -A 79	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurement of Dijet Azimuthal Decorrelations in pp Collisions at √s=7 TeV, PHYSICAL REVIEW LETTERS Volume: 106 Issue: 17 Article Number: 172002 Published: APR 29 2011	2011	PHYSICAL REVIEW LETTERS	7,98625	5
770	E19 -A 80	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of the differential cross-sections of inclusive, prompt and non-prompt J/psi production in proton-proton collisions at root s=7 TeV, NUCLEAR PHYSICS B Volume: 850 Issue: 3 Pages: 387-444 Published: SEP 21 2011	2011	NUCLEAR PHYSICS B	1,89759	2
771	E19 -A 81	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of Wγ and Zγ production in proton-proton collisions at √s =7 TeV with the ATLAS Detector, JOURNAL OF HIGH ENERGY PHYSICS, Vol. 2011, Number 09, 072, SEP 2011	2011	J HIGH ENERGY PHYS	1,67711	8
772	E19 -A 82	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of dijet production with a veto on additional central jet activity in pp collisions at √s=7 TeV using the ATLAS detector, JOURNAL OF HIGH ENERGY PHYSICS Vol. 2011, Number 09, 053, SEP 2011	2011	J HIGH ENERGY PHYS	1,67711	2
773	E19 -A 83	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Properties of jets measured from tracks in proton-proton collisions at center-of-mass energy √s=7 TeV with the ATLAS detector, PHYSICAL REVIEW D 84, Issue: 5, 054001, SEP 2011	2011	Phys Rev D	1,67198	0
774	E19 -A 84	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Search for Supersymmetry Using Final States with One Lepton, Jets, and Missing Transverse Momentum with the ATLAS Detector in √s=7 TeV pp Collisions, PHYSICAL REVIEW LETTERS Volume: 106 Issue: 13 Article Number: 131802 Published: MAR 28 2011	2011	PHYSICAL REVIEW LETTERS	7,98625	9
775	E19 -A 85	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for contact interactions in dimuon events from pp collisions at root s=7 TeV with the ATLAS detector, PHYSICAL REVIEW D Volume: 84 Issue: 1 Article Number: 011101 Published: JUL 1 2011	2011	Phys Rev D	1,67198	4
776	E19 -A 86	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Search for pair production of first or second generation leptoquarks in proton-proton collisions at root s=7 TeV using the ATLAS detector at the LHC, PHYSICAL REVIEW D Volume: 83 Issue: 11 Article Number: 112006 Published: JUN 15 2011	2011	Phys Rev D	1,67198	0
777	E19 -A 87	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurement of underlying event characteristics using charged particles in pp collisions at root s = 900 GeV and 7 TeV with the ATLAS detector, PHYSICAL REVIEW D Volume: 83 Issue: 11 Article Number: 112001 Published: MAY 31 2011	2011	PHYSICAL REVIEW D	1,67198	1
778	E19 -A 88	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurement of the inclusive isolated prompt photon cross section in pp collisions at root s=7 TeV with the ATLAS detector, PHYSICAL REVIEW D Volume: 83 Issue: 5 Article Number: 052005 Published: MAR 18 2011	2011	Phys Rev D	1,67198	2
779	E19 -A 89	DPETI	E. Abat,…, **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Collaboration, A layer correlation technique for pion energy calibration at the 2004 ATLAS Combined Beam Test, JOURNAL OF INSTRUMENTATION Volume: 6 Article Number: P06001 Published: JUN 2011	2011	Journal of Instrumentation	2,12230	0

780	E19 -A 90	DPETI	E. Abat,…, **C. Alexa, V. Boldea, M. Caprini, S. Constantinescu, S. Dita, D. Pantea**, et al., ATLAS Collaboration, Photon reconstruction in the ATLAS Inner Detector and Liquid Argon Barrel Calorimeter at the 2004 Combined Test Beam, JOURNAL OF INSTRUMENTATION Volume: 6 Article Number: P04001 Published: APR 2011	2011	Journal of Instrumentation	2,12230	4
781	E19 -A 91	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Limits on the production of the Standard Model Higgs Boson in pp collisions at √s =7 TeV with the ATLAS detector, EUROPEAN PHYSICAL JOURNAL C 71, 1728, 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	2
782	E19 -A 92	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, M. Ciubancan, S. Constantinescu, M.C. Cuciuc, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for Diphoton Events with Large Missing Transverse Energy with 36 pb-1 of 7 TeV Proton-Proton Collision Data with the ATLAS Detector, EUROPEAN PHYSICAL JOURNAL C 71, 1744, 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	2
783	E19 -A 93	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Studies of the performance of the ATLAS detector using cosmic-ray muons, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 3 Article Number: 1593 Published: MAR 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	3
784	E19 -A 94	DPETI	G. Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, D. Chesneanu, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Measurement of inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV centre-of-mass energy with the ATLAS detector, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 2 Article Number: 1512 Published: FEB 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	9
785	E19 -A 95	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for supersymmetric particles in events with lepton pairs and large missing transverse momentum in root s=7 TeV proton-proton collisions with the ATLAS experiment, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 7 Article Number: 1682 Published: JUL 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	0
786	E19 -A 96	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea** et al., ATLAS Collaboration, Search for an excess of events with an identical flavour lepton pair and significant missing transverse momentum in root s=7 TeV proton-proton collisions with the ATLAS detector, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 7 Article Number: 1647 Published: JUL 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	5
787	E19 -A 97	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Measurements of underlying-event properties using neutral and charged particles in pp collisions at root s=900 GeV and root s=7 TeV with the ATLAS detector at the LHC, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 5 Article Number: 1636 Published: MAY 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	10
788	E19 -A 98	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Luminosity determination in pp collisions at root s=7 TeV using the ATLAS detector at the LHC, EUROPEAN PHYSICAL JOURNAL C Volume: 71 Issue: 4 Article Number: 1630 Published: APR 2011	2011	EUROPEAN PHYSICAL JOURNAL C	1,30361	0
789	E19 -A 99	DPETI	G.Aad,…, **C. Alexa, E. Badescu, V. Boldea, I. Caprini, M. Caprini, S. Constantinescu, P. Dita, S. Dita, L. Micu, D. Pantea, M. Rotaru, G. Stoicea**, et al., ATLAS Collaboration, Search for Diphoton Events with Large Missing Transverse Energy in 7 TeV Proton-Proton Collisions with the ATLAS Detector, PHYSICAL REVIEW LETTERS Volume: 106 Issue: 12 Article Number: 121803 Published: MAR 23 2011	2011	PHYSICAL REVIEW LETTERS	7,98625	0
790	E20 -A 1	DPETI	R.Aaij,..**C.Coca,..M.Orlandea,..E.Teodorescu**,.et al.(LHCb collab)"First observation of B0s→ J/ψ f0(980) decays", Phys.LettB698: 115-122	2011	PHYSICS LETTERS B	3,62428	0
791	E20 -A 2	DPETI	R.Aaij, **C.Coca,..M.Orlandea,..E.Teodorescu** et al.(LHCb collab), "First observation of B0s→D*+s2 Xμ−ν decays". Phys.Lett.B698:14-20	2011	PHYSICS LETTERS B	3,62428	0
792	E20 -A 3	DPETI	R.Aaij,..**C.Coca,..M.Orlandea,E.Teodorescu** et al.(LHCb collab) "Search for the rare decays B0s→μ+μ− and B0→μ+μ−", Phys.Lett.B699: 330-340	2011	PHYSICS LETTERS B	3,62428	0
793	E20 -A 4	DPETI	R.Aaij,..**C.Coca,..M.Orlandea,..E.Teodorescu** et al.(LHCB collab),"Measurement of the inclusive φ cross-section in pp collisions at √s = 7 TeV, Phys.Lett.B703:267-273	2011	PHYSICS LETTERS B	3,62428	2
794	E20 -A 5	DPETI	R.Aaij,..**C.Coca. ..M.Orlandea,..E.Teodorescu** et al.(LHCB collab),"Prompt K0S production in pp collisions at √s = 0.9 TeV", Phys.Lett.B693: 69-80	2010	PHYSICS LETTERS B	3,62428	2
795	E20 -A 6	DPETI	R.Aaij, .**C.Coca. ..M.Orlandea,..E.Teodorescu** et al.(LHCB collab), "Measurement of σ(pp→bbX) at √s = 7 TeV in the forward region", Phys.Lett. B694:209-216	2010	PHYSICS LETTERS B	3,62428	1
796	E20 -A 7	DPETI	H.Abramowicz, .**C.Coca,.L.Dumitru, M.Orlandea,.. E.Teodorescu** (FCAL-collab.58a) "Forward instru-mentation for ILC detectors", JINST 5 P12002	2010	Journal of Instrumentation	2,12230	12
797	E20 -A 8	DPETI	A.A Alves Jr,..**C.Coca, M.Orlandea** et.al.(LHCb collab),"The LHCb Detector at the LHC",JINST 3 S08005	2008	Journal of Instrumentation	2,12230	1
798	E20 -A 9	DPETI	R.Aaij,..**C.Coca, ..M.Orlandea,.. E.Teodorescu** et al. (LHCB collab), "Measurement of V 0 production ratios in pp collisions at ps = 0.9 and 7TeV", JHEP 1108:034	2011	J HIGH ENERGY PHYS	1,67711	9
799	E20 -A 10	DPETI	R.Aaij,..**C.Coca**,..**M.Orlandea,..E.Teodorescu** et al.(LHCbcollab) "Measurement of J/ψ production in pp collisions at √s = 7 TeV", Eur.Phys.J.C71:1645-	2011	European Physical Journal C	1,30361	0
800	E20 -A 40	DPETI	B.Adeva, ..., **G. Caragheorgheopol, C. Ciocarlan, S. Constantinescu, C. Curceanu, M. Gugiu, M. Iliescu, M. Pentia, T. Ponta**, et al, Dirac collaboration, Determination of ππ scattering lengths from measurement of π+π− atom lifetime, PHYSICS LETTERS B, Vol.704, 24-29, 2011	2011	PHYSICS LETTERS B	3,62428	0
801	E21 -A 10	DPETI	Dima, A; Della Corte, F; Rendina, I; **Dima, MO**, Bistable hybrids in sol-gel technology for switching devices, MICROELECTRONICS JOURNAL, Volume: 38, Issue: 12, Pages: 1169-1174, DEC 2007	2007	MICROELECTRON J	0,71360	0
802	E21 -A 106	DPETI	B. Carbunar,...., **O. Carbunar**, Secure Synchronization of Periodic Updates in Ad Hoc Networks, IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, Volume: 21, Issue: 8, Pages: 1060-1073, Published: AUG 2010	2010	IEEE T PARALL DISTR	1,98329	5
803	E21 -A 107	DPETI	**O. Carbunar**, M. Radulian, Geometrical constraints for the configuration of the Vrancea (Romania) intermediate-depth seismicity nest, JOURNAL OF SEISMOLOGY, Volume: 15, Issue: 4, Pages: 579-598, Published: OCT 2011	2011	J SEISMOL	0,90612	1
804	E21 -A 11	DPETI	A. Dima, F.G. Della Corte, C.J. Williams, K.G. Watkins, G. Dearden, N. O'Hare, M. Casalino, I. Rendina, **M. Dima**, Silicon nano-particles in SiO2 sol–gel film for nano-crystal memory device applications, Microelectronics Journal, Volume 39, Issue 5, Pages 768-770, May 2008	2008	MICROELECTRON J	0,71360	39
805	E21 -A 12	DPETI	**M. Dima**, D. Wang, Lorentz Transformation from Symmetry of Reference Principle, INTERNATIONAL JOURNAL OF THEORETICAL PHYSICS, Volume: 47, Issue: 5, Pages: 1455-1458, Published: MAY 2008	2008	INT J THEOR PHYS	0,26099	2
806	E21 -A 13	DPETI	A. Dima, **M. Dima**, Quantum Entanglement Oscillations, INTERNATIONAL JOURNAL OF THEORETICAL PHYSICS, Volume: 48, Issue: 11, Pages: 3228-3233, Published: NOV 2009	2009	INT J THEOR PHYS	0,37342	4
807	E21 -A 15	DPETI	A. Dima, **M. Dima**, B-reconstruction methods with geometric and kinematic constraints, Nuclear Instruments and Methods in Physics Research A606, 446 (2009)	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	2

808	E21 -A 16	DPETI	**Dima M**, **Dulea M**, Aranghel D., et al., Classical and quantum communications in GRID computing, OPTOELECTRONICS AND ADVANCED MATERIALS-RAPID COMMUNICATIONS, 4 (11), pp. 1840-1843, 2010	2010	OPTOELECTRON ADV MAT	0,22680	0
809	E21 -A 17	DPETI	**Aranghel D**, **Tripadus V** , **Radulescu A**, **Petre M**, **Dima MO**, Petre C, Quasielastic neutron scattering on glycerol, JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS, Volume: 12 Issue: 4 Pages: 953-957, 2010	2010	J OPTOELECTRON ADV M	0,32990	0
810	E21 -A 18	DPETI	R. Aaij,..., **M. Dima**, et al, LHCb collab., Measurement of sigma (pp -> b(b)over-barX) at root s=7 TeV in the forward region, PHYSICS LETTERS B 694 (3), pp. 209-216, 2010	2010	PHYSICS LETTERS B	3,62428	0
811	E21 -A 19	DPETI	R. Aaij,..., **M. Dima**, et al, **LHCb collab.**, Prompt K(s)(0) production in pp collisions at root s = 0.9 TeV, PHYSICS LETTERS B 693 (2), pp. 69-80, 2010	2010	PHYSICS LETTERS B	3,62428	3
812	E21 -A 21	DPETI	R. Aaij,..., **M. Dima**, et al, LHCb collab., First observation of (B)over-bar(s)(0) -> D(s2)*(+)X mu(-)(nu)over-bar decays, PHYSICS LETTERS B, 698 (1), pp. 14-20, 2011	2011	PHYSICS LETTERS B	3,62428	0
813	E21 -A 22	DPETI	R. Aaij,..., **M. Dima**, et al, LHCb collab., First observation of B(s)(0) -> J/psi f(0)(980) decays, PHYSICS LETTERS B, 698 (2), pp. 115-122, 2011	2011	PHYSICS LETTERS B	3,62428	0
814	E21 -A 23	DPETI	R. Aaij,..., **M. Dima**, et al, LHCb collab., Search for the rare decays B(s)(0) -> mu(+)mu(-) and B(0) -> mu(+)mu(-) PHYSICS LETTERS B, 699 (5), pp. 330-340, 2011	2011	PHYSICS LETTERS B	3,62428	0
815	E21 -A 24	DPETI	R. Aaij,..., **M. Dima**, et al, LHCb collab., Measurement of J/psi production in pp collisions at root s=7 TeV, EUROPEAN PHYSICAL JOURNAL C, 71 (5), article no. 1645 , 2011.	2011	European Physical Journal C	1,30361	0
816	E21 -A 25	DPETI	**M. Dima**, Exclusive reconstruction of semi-leptonic B-hadron decay modes, JOURNAL OF HIGH ENERGY PHYSICS, Volume 2011, Issue 4, Article Number: 008, DOI: 10.1007/JHEP04(2011)008, Published: APR 2011	2011	J HIGH ENERGY PHYS	1,67711	7
817	E22 -A 1	DPETI	**B. Popovici** on behalf of LHCb collaboration, "Particle production studies at LHCb", Acta Phys. Pol. B 42 (2011) 1547-1556	2011	ACTA PHYS POL B	0,55670	0
818	E22 -A 2	DPETI	LHCb Collaboration (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...) "Measurement of the inclusive phi cross-section in pp collisions at sqrt(s) = 7 TeV", Phys.Lett. B 702 (2011) 267-273	2011	PHYSICS LETTERS B	3,62428	0
819	E22 -A 3	DPETI	LHCb Collaboration (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...) "Measurement of V0 production ratios in pp collisions at 0.9 and 7 TeV", JHEP 034 (2011) 1108.	2011	J HIGH ENERGY PHYS	1,67711	7
820	E22 -A 4	DPETI	LHCb Collaboration, (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...) "First observation of Bs → Ds2*+ Xμν decays", Physics Letters B 698 (2011) 14-20.	2011	PHYSICS LETTERS B	3,62428	17
821	E22 -A 5	DPETI	LHCb Collaboration, (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...),"Search for the rare decays Bs → μμ and Bd → μμ", Phys. Lett. B 699 (2011) 330-340	2011	PHYSICS LETTERS B	3,62428	0
822	E22 -A 6	DFNA	LHCb Collaboration,…, **F. Constantin, C. Pavel- Nicorescu,** Measurement of J/psi production in pp collisions at root s=7 TeV, **European Physical Journal C** , 71, 1645, 2011	2011	European Physical Journal C	1,30361	3
823	E22 -A 6	DPETI	LHCb Collaboration, (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...), "Measurement of J/ψ production in collisions at = 7 TeV" , Eur. Phys. J. C 71 (2011) 1645	2011	European Physical Journal C	1,30361	3
824	E22 -A 7	DPETI	LHCb Collaboration, (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...), "First observation of B0s → J/ ψ f0(980) decays", Physics Letters B 698 (2011) 115-122.	2011	PHYSICS LETTERS B	3,62428	3
825	E22 -A 8	DPETI	LHCb Collaboration, (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...), "Measurement of σ(pp → b anti-b X) at 7 TeV in the forward region", Physics Letters B 694 (2010) 209-216..	2010	PHYSICS LETTERS B	3,62428	13
826	E22 -A 9	DPETI	LHCb Collaboration, (…, **C. Coca, A. Grecu, R. Muresan, M. Orlandea, C. Pavel-Nicorescu, B. Popovici, S. Stoica, E. Teodorescu**...), "Prompt KS production in pp collisions at = 0.9 TeV", Physics Letters B 693 (2010) 69-80.	2010	PHYSICS LETTERS B	3,62428	0
827	E22 -A 10	DPETI	LHCb Collaboration (…, **C. Coca, S. Stoica**...) "The LHCb Detector at the LHC", JINST 3 (2008) S08005	2008	Journal of Instrumentation	2,12230	0
828	E23 -A 1	DPETI	Barmin V. V.; Asratyan A. E.; Borisov V. S., **Curceanu C.** Group DIANA Collaboration *Formation of a Narrow Baryon Resonance with Positive Strangeness in K(+) Collisions with Xe Nuclei*	2010	PHYS ATOM NUCL	0,24	2
829	E23 -A 2	DPETI	Barmin V. V.; Asratyan A. E.; Borisov V. S., **Curceanu C.** Group DIANA Collaboration *Further evidence for formation of a narrow baryon resonance with*	2007	PHYS ATOM NUCL	0,24	31
830	E23 -A 3	DPETI	Sperandio L.; Bartalucci S.; Bertolucci S., **Curceanu C. Sirghi, F., Sirghi, D. L.** *New limit on the Pauli Exclusion Principle violation by electrons* NUOVO CIMENTO DELLA SOCIETA ITALIANA DI FISICA B-BASIC	2007	NUOVO CIMENTO B	0,24	0
831	E23 -A 4	DPETI	Hiraiwa T.; Ajimura S.; Beer G., **Curceanu C.** Group J-PARC E15 Collaboration *The search for deeply bound kaonic nuclear states at j-parc* INTERNATIONAL JOURNAL OF MODERN PHYSICS A Volume: 26	2011	INT J MOD PHYS	0,39	1
832	E23 -A 5	DPETI	Pietreanu D.; Bartalucci S.; Bertolucci S., **Curceanu C. Sirghi, F., Sirghi, D. L.** Group VIP Collaboration *VIP experiment: new experimental limit on pauli exclusion principle*	2009	INT J MOD PHYS	0,39	0
833	E23 -A 6	DPETI	Sirghi D. L.; Bazzi M.; Beer G., **Curceanu C.** *Kaonic helium measurements in the siddharta experiment* INTERNATIONAL JOURNAL OF MODERN PHYSICS A Volume: 26 Issue: 3-4 Pages: 601-603 DOI: 10.1142/S0217751X11052165	2011	INT J MOD PHYS	0,39	0
834	E23 -A 7	DPETI	Vidal A. Romero; Bazzi M.; Beer G., **Curceanu C.** Group SIDDHARTA Collaboration *X-ray spectroscopy of kaonic atoms at DA Phi NE*	2011	INT J MOD PHYS	0,39	0
835	E23 -A 8	DPETI	Wuenschek B. K.; Bhang H.; Cargnelli M., **Curceanu C.** *Status and plans of experiment e17 at J-PARC* INTERNATIONAL JOURNAL OF MODERN PHYSICS A Volume: 26 Issue: 3-4 Pages: 604-606 DOI: 10.1142/S0217751X11052177 Published: FEB 10 2011	2011	INT J MOD PHYS	0,39	0
836	E23 -A 9	DPETI	Zmeskal J.; Bazzi M.; Beer G., **Curceanu C.** *Kaonic atoms at DA Phi NE - the SIDDHARTA experiment* INTERNATIONAL JOURNAL OF MODERN PHYSICS A Volume: 24 Issue: 2-3 Pages: 190-197 Published: JAN 30 2009	2009	INT J MOD PHYS	0,39	1

837	E23 -A 10	DPETI	**Curceanu (Petrascu) C**.; Bartalucci S.; **Bragadireanu M.**, **Curceanu C. Sirghi, F., Sirghi, D. L.** *Experimental tests of quantum mechanics pauli exclusion principle violation (the vip experiment) and future perspectives* INTERNATIONAL JOURNAL OF QUANTUM INFORMATION Volume: 9 Supplement: 1 Pages: 145-154 DOI: 10.1142/S0219749911007162 Published: JAN 2011	2011	INT J QUANT INFORM	0,5	0
838	E23 -A 11	DPETI	**Curceanu C.** (Petrascu); Zmeskal J. Group SIDDHARTA *Kaonic atoms/nuclei measurements at da phi ne: siddharta and amadeus* MODERN PHYSICS LETTERS A Volume: 23 Issue: 27-30 Pages: 2524-2527 DOI: 10.1142/S0217732308029721 Published: SEP 30 2008	2008	MOD PHYS LETT A	0,56	1
839	E23 -A 12	DPETI	Hayano Ryugo S.; Beer G.; Bhang H., **Curceanu C.** Group KEK E570 Collaboration *Solving the kaonic-helium puzzle* MODERN PHYSICS LETTERS A Volume: 23 Issue: 27-30 Pages: 2505-2511 DOI: 10.1142/S021773230802968X Published: SEP 30 2008	2008	MOD PHYS LETT A	0,56	1
840	E23 -A 13	DPETI	Bartalucci S.; Bertolucci S.; **Bragadireanu M.**, **Curceanu C. Sirghi, F., Sirghi, D. L.** *The VIP Experimental Limit on the Pauli Exclusion Principle Violation by Electrons* FOUNDATIONS OF PHYSICS Volume: 40 Issue: 7 Special Issue: SI Pages: 765-775, 2010	2010	FOUND PHYS	0,63	1
841	E23 -A 14	DPETI	**Curceanu (Petrascu) C**.; Bartalucci S.; Bertolucci S., **Curceanu C. Sirghi, F., Sirghi, D. L.** *New Experimental Limit on the Pauli Exclusion Principle Violation by Electrons-The VIP Experiment* FOUNDATIONS OF PHYSICS Vol 41 Iss 3 Pages: 282-287, 2011	2011	FOUND PHYS	0,63	0
842	E23 -A 15	DPETI	Milotti Edoardo; **Curceanu (Petrascu) C**.; Adler Stephen L., **Curceanu C.** *Special Issue on Spin Statistics* FOUNDATIONS OF PHYSICS Volume: 40 Issue: 7 Special Issue: SI Pages: 681-683, 2010	2010	FOUND PHYS	0,63	1
843	E23 -A 16	DPETI	Buehler P.; **Curceanu C.**; Guaraldo C., Group J-PARC P29 Collaboration Conference: Conference on NFQCD Location: Kyoto, JAPAN Date: JAN 18-MAR 19, 2010 *Search for phi-Meson Nuclear Bound States in the (p)over-bar + (A)Z -> phi + (A-1)(phi)(Z-1) Reaction* PROGRESS OF THEORETICAL PHYSICS SUPPLEMENT Issue: 186 Pages: 337-342 Published: 2010	2010	PROG THEOR PHYS SUPPL	0,68270	0
844	E23 -A 17	DPETI	Bazzi M.; Beer G.; Bombelli L., **Curceanu C. Sirghi, F., Sirghi, D. L.** *New precision measurements of the strong interaction in kaonic hydrogen* FEW-BODY SYSTEMS Volume: 44 Issue: 1-4 Pages: 79-82 DOI: 10.1007/s00601-008-0261-3 Published: DEC 2008	2008	FEW-BODY SYST	0,71	0
845	E23 -A 18	DPETI	**Curceanu (Petrascu) C**.; Bazzi M.; Beer G., **Curceanu C. Sirghi, F., Sirghi, D. L.** *Low-Energy Kaon-Nucleon/Nuclei Interaction Studies at DA Phi NE (SIDDHARTA and AMADEUS Experiments)* FEW-BODY SYSTEMS Volume: 50 Issue: 1-4 Pages: 447-449 DOI: 10.1007/s00601-010-0184-7 Published: MAY 2011	2011	FEW-BODY SYST	0,71	0
846	E23 -A 19	DPETI	Cargnelli M.; Ishiwatari T.; Kienle P., **Curceanu C., Sirghi, F., Sirghi, D. L.** Conference: International Workshop on Precision Physics of Simple Atomic Systems Location: Venice Int Univ, Venice, ITALY Date: JUN 12-16, 2006 *Kaonic hydrogen X-rays experiments at DAFNE* CANADIAN JOURNAL OF PHYSICS Volume: 85 Issue: 5 Pages: 479-485 DOI: 10.1139/P07-030 Published: MAY 2007	2007	CAN J PHYS	0,86	2
847	E23 -A 20	DPETI	Anelli M.; Battistoni G.; Bertolucci S., **Curceanu C.** Conference: 11th International Vienna Conference on Instrumentation Location: Vienna, AUSTRIA Date: FEB 19-24, 2007 Sponsor(s): Austrian Fed Minist Educ, Sci & Culture; Austrian Fed Minist Transport, Innovat & Technol; Vienna Convent Bur *Measurement and simulation of the neutron response and detection efficiency of a Pb-scintillating fiber calorimeter* NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 581 Issue: 1-2 Pages: 368-372 DOI: 10.1016/j.nima.2007.08.005 Published: OCT 21 2007	2007	NUCL INSTR & METH IN PHYS RES A	1,02	4
848	E23 -A 21	DPETI	Anelli M.; Battistoni G.; Bertolucci S., **Curceanu C.** *Measurement of the detection efficiency of the KLOE calorimeter for neutrons between 22 and 174 MeV* NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 598 Issue: 1 Pages: 244-247 DOI: 10.1016/j.nima.2008.08.120 Published: JAN 1 2009	2009	NUCL INSTR & METH IN PHYS RES A	1,02	0
849	E23 -A 22	DPETI	Anelli M.; Bertolucci S.; Bini C., **Curceanu C.** *Measurement of the neutron detection efficiency of a 80% absorber-20% scintillating fibers calorimeter* NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 626 Pages: 67-71 DOI: 10.1016/j.nima.2010.10.094 Published: JAN 11 2011	2011	NUCL INSTR & METH IN PHYS RES A	1,02	0
850	E23 -A 23	DPETI	Anelli M.; Bertolucci S.; Bini C., **Curceanu C.** Conference: 11th Pisa Meeting on Advanced Detectors Location: Isola Elba, ITALY Date: MAY 24-30, 2009 *Measurement of neutron detection efficiency between 22 and 174 MeV using two different kinds of Pb-scintillating fiber sampling calorimeters* NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 617 Issue: 1-3 Pages: 107-108 DOI: 10.1016/j.nima.2009.09.104 Published: MAY 11 2010	2010	NUCL INSTR & METH IN PHYS RES A	1,02	0

851	E23 -A 24	DPETI	Bazzi M.; Beer G.; Bombelli L., **Curceanu C. Sirghi, F., Sirghi, D. L.** Conference: 12th International Vienna Conference on Instrumentation Location: Vienna, AUSTRIA Date: FEB 15-20, 2010 *Performance of silicon-drift detectors in kaonic atom X-ray measurements* NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 628 Issue: 1 Pages: 264-267 DOI: 10.1016/j.nima.2010.06.332 Published: FEB 1 2011	2011	NUCL INSTR & METH IN PHYS RES A	1,02	2
852	E23 -A 25	DPETI	Anelli A.; Battistoni G.; Bertolucci S., **Curceanu C.** Conference: 9th International Conference on Inorganic Scintillators and their Applications Location: Winston Salem, NC Date: JUN 04-08, 2007 Sponsor(s): IEEE *Measurement and simulation of the neutron response and detection efficiency of a Pb-scintillating fiber calorimeter* IEEE TRANSACTIONS ON NUCLEAR SCIENCE Volume: 55 Issue: 3 Pages: 1409-1412 DOI: 10.1109/TNS.2008.924061 Part: Part 2 Published: JUN 2008	2008	IEEE TRANSACTIONS ON NUCLEAR SCIENCE	1,06286	0
853	E23 -A 26	DPETI	Marton Johann; Cargnelli M.; Ishiwatari T., **Curceanu C. Sirghi, F., Sirghi, D. L.** Conference: Symposium on Radiation Measurements and Applications Location: Berkeley, CA Date: JUN 02-05, 2008 Sponsor(s): IEEE Nucl & Plasma Sci Soc; NNSA; DNDO; DTRA *New X-Ray Detectors for Exotic Atom Research* IEEE TRANSACTIONS ON NUCLEAR SCIENCE Volume: 56 Issue: 3 Pages: 1400-1404 DOI: 10.1109/TNS.2008.2005980 Published: JUN 2009	2009	IEEE TRANSACTIONS ON NUCLEAR SCIENCE	1,06286	1
854	E23 -A 27	DPETI	Cargnelli M.; Bazzi M.; Beer G., **Curceanu C. Sirghi, F., Sirghi, D. L.** *Kaonic atoms studies at DAFNE by the SIDDHARTA experiment* NUCLEAR PHYSICS A Volume: 835 Issue: 1-4 Pages: 27-34 DOI: 10.1016/j.nuclphysa.2010.01.171 Published: APR 1 2010	2010	NUCLEAR PHYSICS A	1,09	5
855	E23 -A 28	DPETI	Okada S.; Beer G.; Bhang H., **Curceanu C.** NUCLEAR PHYSICS A Volume: 790 Pages: 663C-666C DOI: 10.1016/j.nuclphysa.2007.03.113 Published: JUN 15 2007	2007	NUCLEAR PHYSICS A	1,09	0
856	E23 -A 29	DPETI	Zmeskal J.; Bazzi M.; Beer G., **Curceanu C. Sirghi, F., Sirghi, D. L.** *Experimental studies on kaonic atoms at DA Phi NE* NUCLEAR PHYSICS A Volume: 790 Pages: 667C-670C DOI: 10.1016/j.nuelphysa.2007.03.012 Published: JUN 15 2007	2007	NUCLEAR PHYSICS A	1,09	2
857	E23 -A 30	DPETI	Zmeskal J.; Bazzi M.; Bragadireanu M., **Curceanu C.** *The AMADEUS experiment - precision measurements of low-energy antikaon nucleus/nucleon interactions* NUCLEAR PHYSICS A Volume: 835 Issue: 1-4 Pages: 410-413 DOI: 10.1016/j.nuclphysa.2010.01.231 Published: APR 1 2010	2010	NUCLEAR PHYSICS A	1,09	5
858	E23 -A 31	DPETI	**Curceanu C.**; Bazzi M.; Beer G., **Curceanu C. Sirghi, F., Sirghi, D. L.** Conference: 4th International Conference on Quarks and Nuclear Physics Location: Madrid, SPAIN Date: JUN 05-10, 2006 *Precision measurements of kaonic atoms at DA phi NE and future perspectives* EUROPEAN PHYSICAL JOURNAL A Volume: 31 Issue: 4 Pages: 537-539 DOI: 10.1140/epja/i2006-10197-2 Published: MAR 2007	2007	EUR PHYS J A	1,11	23
859	E23 -A 32	DPETI	Adeva B.; Afanasyev L.; Allkofer Y., **Curceanu C.** *Evidence for pi K-atoms with DIRAC* PHYSICS LETTERS B Volume: 674 Issue: 1 Pages: 11-16 DOI: 10.1016/j.physletb.2009.03.001 Published: APR 6 2009	2009	PHYS LETT B	3,62	0
860	E23 -A 33	DPETI	Adeva B.; Afanasyev L.; Benayoun M., **Curceanu C.** *Determination of pi pi scattering lengths from measurement of pi(+)pi(-) atom lifetime* PHYSICS LETTERS B Volume: 704 Issue: 1-2 Pages: 24-29 DOI: 10.1016/j.physletb.2011.08.074 Published: OCT 5 2011	2011	PHYS LETT B	3,62	0
861	E23 -A 34	DPETI	Bazzi M.; Beer G.; Bombelli L., **Curceanu C.** Group SIDDHARTA Collaboration *A new measurement of kaonic hydrogen X-rays* PHYSICS LETTERS B Volume: 704 Issue: 3 Pages: 113-117 DOI: 10.1016/j.physletb.2011.09.011 Published: OCT 13 2011	2011	PHYS LETT B	3,62	1
862	E23 -A 35	DPETI	Bazzi M.; Beer G.; Bombelli L., **Curceanu C.** Group SIDDHARTA Collaboration *First measurement of kaonic helium-3 X-rays* PHYSICS LETTERS B Volume: 697 Issue: 3 Pages: 199-202 DOI: 10.1016/j.physletb.2011.02.001 Published: MAR 7 2011	2011	PHYS LETT B	3,62	1
863	E23 -A 36	DPETI	Bazzi M.; Beer G.; Bombelli L., **Curceanu C. Sirghi, F., Sirghi, D. L.** *Kaonic helium-4 X-ray measurement in SIDDHARTA* PHYSICS LETTERS B Volume: 681 Issue: 4 Pages: 310-314 DOI: 10.1016/j.physletb.2009.10.052 Published: NOV 9 2009	2009	PHYS LETT B	3,62	18
864	E23 -A 37	DPETI	Okada S.; Beer G.; Bhang H., **Curceanu C. Sirghi, F., Sirghi, D. L.** *Precision measurement of the 3d -> 2p x-ray energy in kaonic He-4* PHYSICS LETTERS B Volume: 653 Issue: 5-6 Pages: 387-391 DOI: 10.1016/j.physletb.2007.08.0 Published: SEP 27 2007	2007	PHYS LETT B	3,62	29
865	E23 -A 38	DPETI	Barmin V. V.; Asratyan A. E.; Borisov V. S., **Curceanu C.** Group DIANA Collaboration *Experimental Search for Radiative Decays of the Pentaquark Baryon Theta(+)(1540)* PHYSICS OF ATOMIC NUCLEI Volume: 73 Issue: 7 Pages: 1164-1167 DOI: 10.1134/S1063778810070094 Published: JUL 2010	2010	PHYS ATOM NUCL	0,24	0
866	E24 -A 1	DFVM	Radu B. M., **Bacalum M.**, Marin A., Chifiriuc C.M., Lazar V., **Radu M.**, Mechanisms of ceftazidime and ciprofloxacin transport through porins in multidrug-resistance developed by extended-spectrum beta-lactamase E.coli strains, **J. Fluoresc**, 21, 4, 1421-1429 (2011)	2011	J. Fluoresc	1,24242	1
867	E24 -A 2	DFVM	Florescu M., Stoicescu C, Magda S., **Petcu IL., Radu M.**, Palombo C., Cinteza M., Lichiardopol R., Vinereanu D., "Supranormal" Cardiac Function in Athletes Related to Better Arterial and Endothelial Function, **Echocardiogr-J Card**., 27, 6, 659-667 (2010)	2010	Echocardiogr-J Card.	0,55635	1

868	E24 -A 5	DFVM	**Preoteasa E.A.**, Preoteasa E., **Harangus L.**, Moldovan A., **Dinescu M.**, Grambole D., Herrmann F., Proton µ-PIXE mapping, AFM imaging and size statistics of mineral granules in a dental composite, , **X-Ray Spectrom.**, 39, 3, 208-215 (2010)	2010	X-Ray Spectrom.	0,84032	0
869	E24 -A 8	DFVM	**Preoteasa E.A.**, Preoteasa E., **Ciortea C., Marin D.D., Gurban D., Gugiu M., Scafes A.**,PIXE and PIGE assessment of in vivo elemental and physical changes of a composite from a dental filling, **X-Ray Spectrom.**, 38, 548-556, (2009)	2009	X-Ray Spectrom.	0,84032	0
870	E24 -A 10	DFVM	**Preoteasa E.A.**, Preoteasa E., Kuczumow A., **Gurban D., Harangus L.**, Grambole D., Herrmann F., Broad-beam PIXE and µ-PIXE analysis of normal and in vitro demineralized dental enamel, **X-Ray Spectrom.**, 37, 5, 517-535 (2008)	2008	X-Ray Spectrom.	0,84032	1
871	E24 -A 33	DPETI	A. Cardone, **L. Gr. Ixaru**, B. Paternoster, Exponential fitting Direct Quadrature methods for Volterra integral equations, NUM. ALGOR. 55, 467-480 (2010)	2010	NUMERICAL ALGORITHMS	0,84259	0
872	E25 -A 9	DFVM	Nae M., Gazdaru D., **Acasandrei A.**, Georgescu R., Macri B.M., **Radu M.**, A fluorescence approach of the gamma radiations effects on gramicidin A inserted in liposomes, **J. Pep. Sci.**, 14, 9, 1003-1009 (2008)	2008	J. Pep. Sci.	1,02424	0
873	E25 -A 44	DFVM	Hofman D., Monte L., Boyer P., Brittain J., Donchyts G., Gallego E., **Gheorghiu D.**, Hakanson L., Heling R., Kerekes A., Kocsy G., Lepicard S., Slavik O., **Slavnicu D.**, Smith J., Zheleznyak M., Computerised Decision Support Systems for the management of freshwater radioecological emergencies: assessment of the state-of-the-art with respect to the experiences and needs of end-users, **J. Environ. Radioactiv**., 102, 2, 119-127 (2011)	2011	J. Environ. Radioactiv	0,78727	0
874	E25 -A 45	DFVM	**Vamanu D.V., Slavnicu S.D., Gheorghiu A., Acasandrei V.T.**, Slavnicu E.,The Hydrological Impact Assessment in the Decision Support of Nuclear Emergency Response, **Radiat. Prot. Dosim**., Technical Note, 140, 2, 191-201 (2010)	2010	Radiat. Prot. Dosim.,	0,85714	0
875	E25 -A 46	DFVM	**Vamanu D.V., Vamanu B.I., Acasandrei V.T.**, Maceika E., Plukis A., EURISOL Desktop Assisstant Toolkit (EDAT): A Modeling, Simulation and Visualization Support to the Preliminary Radiological Assessment of RIB Projects, **Eur. Phys. J. A.**, 44, 1, ISSN: 1434-6001 (Print) 1434-601X (Online), 10.1140/epja/i2010-10935-9, 129–146 (2010) [ISI = 2.015]	2010	European Physical Journal A	1,10519	7
876	E25 -A 47	DFVM	**Melintescu A., Galeriu A.**, Exchange velocity approach and the role of photosynthesis for tritium transfer from atmosphere to plants, **Fusion Sci. Technol.**, 60 (3), 1179 – 1182 (2011)	2011	Fusion Science and Technology	0,81429	0
877	E25 -A 48	DFVM	**Galeriu D., Melintescu A.**, Research and development of environmental tritium modelling, **Fusion Sci. Technol.**, 60 (4), 1232 – 1237 (2011)	2011	Fusion Science and Technology	0,81429	0
878	E25 -A 49	DFVM	**Melintescu A., Galeriu D.**, Dynamic model for tritium transfer in an aquatic food chain, **Radiat. Environ. Bioph**., 50:459–473 (2011)	2011	Radiat. Environ. Bioph.	1,15870	0
879	E25 -A 50	DFVM	Yankovich T.L., Kim S.B., Baumgaertner F., **Galeriu D., Melintescu A.**, Miyamoto K., Saito M., Siclet F., Davis P., Measured and Modelled Tritium Concentrations in Freshwater Barnes Mussels (Elliptio complanata) Exposed to an Abrupt Increase in Ambient Tritium Levels, **J. Environ. Radioactiv**., 102, 26-34 (2011)	2011	J. Environ. Radioactiv	0,78727	0
880	E25 -A 51	DFVM	Atanassov D., **Galeriu D.**, Rain Scavenging of Tritiated Water Vapour: A Numerical Eulerian Stationary Model, **J. Environ. Radioactiv**., 102:43-52 (2011)	2011	J. Environ. Radioactiv	0,78727	0
881	E25 -A 52	DFVM	Takeda H., Fuma S., Miyamoto K., Yanagisawa K., Ishii N., Kawaguchi I., **Melintescu A., Galeriu D.**, Comparative Biokinetics of Radiocarbon Ingested as compounds or Foods in Rats, **Health Phys**., 99(5):668-673 (2010)	2010	Health Phys.	0,94286	0
882	E25 -A 53	DFVM	**Melintescu A., Galeriu D.**, Energy metabolism used as a tool to model the transfer of 14C and 3H in animals, **Radiat. Environ. Bioph**., 49:657-672 (2010)	2010	Radiat. Environ. Bioph.	1,15870	0
883	E25 -A 54	DFVM	**Galeriu D., Melintescu A.**, Retention of tritium in reference persons: a metabolic model. Derivation of parameters and application of the model to the general public and to workers, **J. Radiol. Prot**., 30 (3), 445-468	2010	J. Radiol. Prot.,	1,28000	0
884	E25 -A 55	DFVM	**Galeriu D.**, Davis P., Workman W., Tritium profiles in snowpacks, **J. Environ. Radioactiv**., 101:869-874 (2010)	2010	J. Environ. Radioactiv	0,78727	0
885	E25 -A 56	DFVM	Takeda H., Fuma S., Miyamoto K., Yanagisawa K., Ishii N., Kawaguchi I., Doi K, **Melintescu A., Galeriu D.**, Biokinetics of Radiocarbon Ingested as a Food in Rats, **Health Phys**., 96 (5), 587-593 (2009)	2009	Health Phys.	0,94286	1
886	E25 -A 57	DFVM	**Galeriu D., Melintescu A.**, Beresford N.A., Takeda H., Crout N.M.J., The Dynamic transfer of 3H and 14C in mammals - a proposed generic model, **Radiat. Environ. Bioph**., 48:29–45 (2009)	2009	Radiat. Environ. Bioph.	1,15870	8
887	E25 -A 58	DFVM	Koarashi J., Davis P.A., **Galeriu D., Melintescu A.**, Saito M., Siclet F., Uchida S., Carbon-14 transfer into rice plants from a continuous atmospheric source: Observations and model predictions, **J. Environ. Radioactiv**., 99, 1671-1679 (2008)	2008	J. Environ. Radioactiv	0,78727	0
888	E25 -A 59	DFVM	**Galeriu D.**, Davis P., Raskob W., **Melintescu A.**, Recent Progresses in Tritium Radioecology and Dosimetry, **Fusion Sci. Technol.**, 54, 1, 237-242 (2008)	2008	Fusion Science and Technology	0,81429	0
889	E25 -A 60	DFVM	**Melintescu A., Galeriu D.**, Tritium transfer in pigs - a model test, **Fusion Sci. Technol**., 54, 1, 269-272 (2008)	2008	Fusion Science and Technology	0,81429	4
890	E25 -A 61	DFVM	**Galeriu D., Melintescu A.**, Beresford N.A., Crout N.M.J., Peterson R., Takeda H., Modelling H-3 and C-14 transfer to farm animals and their products under steady state conditions, **J. Environ. Radioactiv.**, 98: 205 - 217 (2007)	2007	J. Environ. Radioactiv	0,78727	0
891	E25 -A 62	DFVM	**Galeriu D., Melintescu A.**, Takeda H., Reassessment of tritium dose coefficients for the general public, **Radiat. Prot. Dosim**., 127 (1-4):153-157 (2007)	2007	Radiat. Prot. Dosim.,	0,85714	16
892	E26 -A 1	DRMR	D. Abriola, M. Bostan, S. Erturk, M. Fadil, M. Galan, S. Juutinen, T. Kibédi, F. Kondev, **A. Luca**, **Al. Negret**, N. Nica, B. Pfeiffer, B. Singh, A. Sonzogni, J. Timar, J. Tuli, T. Venkova, K. Zuber, "Nuclear Data Sheets for A=84", Nuclear Data Sheets 110, 2815-2944.	2009	Nuclear Data Sheets	2,13715	11
893	E26 -A 7	DFVM	F.Mihai, **S.Bercea, A.Stochioiu, A.Celarel**, E.Udrup,I.Tudor; "Low and high dose measurement by Agfa personal monitoring film and FD III B badge dosimeter"; vol.68, p.614-616 system	2010	Applied Radiations and Isotopes	1,08857	0
894	E26 -A 12	DFVM	**Mihai F.**, Bercea S., **Stochioiu A., C**elarel A., Udup E., Low and High Dose Measurement by Agfa Personal Monitoring Film and FD-III-B Badge Dosimeter System, **Appl. Radiat. Isotopes**, 68, 614-616 (2010)	2010	Applied Radiations and Isotopes	1,08857	0
895	E26 -A 13	DFVM	**Margineanu R., Simion C.**, **Bercea S.**, Duliu O.G., **Gheorghiu D.**, **Stochioiu A.**, Matei M., The Slanic Prahova (ROMANIA) underground low backdround radiation laboratory, **Appl. Radiat. Isotopes**, 66, 1501-1506 (2008)	2008	Applied Radiations and Isotopes	1,08857	0
896	E26 -A 14	DFVM	**Calin M.R.,** Calin M.A., Vlase S., **Radulescu I., Simion C.A.,** Advanced materials and technologies for high-pressure krypton detectors in industrial use, **J. Optoelectron. Adv. M**., 13, 1193-1196 (2011)	2011	J OPTOELECTRON ADV M	0,32990	0

897	E26 -A 15	DFVM	**Radulescu I.**, Rigollet C., van der Graaf E.R. , De Meijer R.J., Towards sub-centimeter resolution in bore-core logging, Nuclear Instruments and Methods in Physics Research Section A, **Nucl. Instrum. Meth A.**, 580, 1, 675-678 (2007)	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	0
898	E26 -A 16	DFVM	**Calin M.R.,** Calin M.A., Evaluation of the Radon concentration in Ocna Dej salt mine, Romania, **J. Radioanal. Nucl. Ch.**, 286, 1, 169-173, 10.1007/s10967-010-0648-8 (2010)	2010	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	0
899	E26 -A 17	DFVM	**Calin M.R.**, Calin M.A., Investigations on the presence and distribution of Radon in the Cacica salt mine, Romania, **J. Radioanal. Nucl. Ch.**, 288, 1, 203-206, 10.1007/s10967-010-0900-2 (2011)	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	4
900	E26 -A 18	DFVM	**Calin M.R.**, Calin M.A., System for air 222Rn activity concentration measurements based on ion-pulse ionization chamber detector, **J. Radioanal. Nucl. Ch**., 288, 1, 109-114, 10.1007/s10967-010-0877-x (2011)	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	0
901	E26 -A 19	DFVM	**Calin M.R.**, Calin M.A., **Done L.**, Druker A.E., Calin A.C., Assessment of calibration parameters for gamma-ray spectrometry systems, **J. Radioanal. Nucl. Ch**., 288, 2, 547-552, 10.1007/s10967-010-0961-2 (2011)	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	33
902	E26 -A 20	DFVM	Teodorescu-Draghicescu H., Vlase S., Scutaru L., Serbina L., **Calin M.R.**, Hysteresis effect in a three-phase polymer matrix composite subjected to static cyclic loadings, **Optoelecron. Adv. Mat**., 5, 3, 273-277 (2011)	2011	OPTOELECTRON ADV MAT	0,22680	0
903	E26 -A 21	DFVM	Vlase S., Teodorescu-Draghicescu H., Motoc D.L., Scutaru M.L., Serbina L., **Calin M.R.,** Behavior of multiphase fiber-reinforced polymers under short time cyclic loading, **Optoelecron. Adv. Mat.**, 5, 4, 419-423 (2011)	2011	OPTOELECTRON ADV MAT	0,22680	0
904	E26 -A 22	DFVM	Vlase S., Teodorescu-Draghicescu H., **Calin M.R.,** Serbina L., Simulation of the elastic properties of some fibre-reinforced composite laminates under off-axis loading system, **Optoelecron. Adv. Mat.**, 5, 4, 424-429 (2011)	2011	OPTOELECTRON ADV MAT	0,22680	0
905	E26 -A 23	DFVM	**Calin M.R.**, Calin M.A., Vlase S., **Radulescu I.**, **Simion C.A.**, Advanced materials and technologies for high-pressure krypton detectors in industrial use, **J. Optoelectron. Adv. M.**, 13, 9, 1193 – 1196 (2011)	2011	J OPTOELECTRON ADV M	0,32990	1
906	E26 -A 24	DFVM	Teodorescu-Draghicescu H., Stanciu A., Vlase S., Scutaru L., **Calin M.R.**, Serbina L., Finite element method analysis of some fibre-reinforced composite laminates, **Optoelecron. Adv. Mat.**, 5, 7, 782-785 (2011)	2011	OPTOELECTRON ADV MAT	0,22680	0
907	E26 -A 25	DFVM	**Calin M.R.**, Gas spherical ionization chamber, **J. Radioanal Nucl. Ch.**, 0236-5731, 290, 2, 361-366, 10.1007/s10967-011-1373-7 (2011)	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	12
908	E26 -A 26	DFVM	**Calin M.R.,** Calin M.A., Simionca GH., Mera O., Indoor radon levels and natural radioactivity in Turda salt mine, Romania, **J. Radioanal Nucl. Ch.**, 10.1007/s10967-011-1394-2 (2011)	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	9
909	E26 -A 28	DFVM	**Margineanu R.M., Apostu A.M.,** Duliu O.G., **Bercea S**., External dose rate in Unirea salt mine, Slanic-Prahova, Romania, **Appl. Radiat. Isotopes**, 67, 759-761 (2009)	2009	Applied Radiations and Isotopes	1,08857	0
910	E26 -A 29	DFVM	Aalseth C., Andreotti E., Arnold D., Sanchez Cabeza J.A., Degering D., Giuliani A., de Ordu R.G., Gurriaran R., Hult M., Keillor M., Laubenstein M., Le Petit G., **Margineanu R.M.,** Matthews M., Miley H., Osvath I., Pellicciari M., Plastino W., Simgen H., Weber M., Werzi R., Ultra-low background measurements of decayed aerosol filters, **J. Radioanal. Nucl. Ch**., 282, 731-735, 3 (2009)	2009	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	2
911	E26 -A 30	DFVM	**Margineanu R., Simion C., Vasile M.**, The first romanian underground laboratory in ultralow radiation background, **J. Labelled Compd. Rad.**, 50 (5-6), 494 – 495 (2007)	2007	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	3
912	E26 -A 32	DFVM	**Simion** C.A., Theoretical investigation of radicalic species formed from L-α-alanine under γ irradiation, **J. Radioanal. Nucl. Ch**, 275 (2), 331-335 (2008)	2008	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	17
913	E26 -A 33	DFVM	**Bordeanu C.,** Rolfs C., **Margineanu R., Negoita F., Simion C.,** Saltmine underground accelerator lab for nuclear astrophysics, **J. Phys. G. Nucl. Partic**., 35 (1), 014011 (2008)	2008	J PHYS G NUCL PARTIC	1,00000	0
914	E26 -A 34	DFVM	**Margineanu R., Simion C., Bercea S**., Duliu O.G., **Gheorghiu D., Stochioiu A., Matei M.**, The Slanic-Prahova (ROMANIA) underground low-background radiation laboratory, **Appl. Radiat. Isotopes**, 66, 1501-1506 (2008)	2008	Applied Radiations and Isotopes	1,08857	0
915	E26 -A 35	DFVM	Cristache C., **Simion C.A.**, **Margineanu R.M.**, Culicov O.A., Frontasyeva M.V., Matei M., Duliu O.G., Epithermal neutrons activation analysis, radiochemical and radiometric investigations of evaporitic deposits of Slanic-Prahova (Romania) salt mine, **Radiochim. Acta**, 97, 333-337 (2009)	2009	Radiochimica Acta	1,13143	0
916	E26 -A 36	DFVM	**SimionC.A., Paunescu N., Mocanu N., Calin M.R., Bercea S., Mitrica B.**, Ultra low radiation background LSC measurements in a salt mine; a feasibility study, **J. Labelled Compd. Rad**., 53 (5-6), 308-312 (2010)	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	11
917	E26 -A 37	DFVM	**Saizu M.A.,** Estimation of natural potassium concentration in Romanian males by *in vivo* gamma-ray spectrometry measurements, **J. Radioanal. Nucl. Ch.** 10.1007/s10967-011-1397-z (2011)	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	24
918	E26 -A 38	DFVM	**Saizu M.A.,** Quality Assurance Programme Implemented in the Whole Body Monitoring Laboratory from IFIN-HH Romania, **Radiat. Prot. Dosim**., 10.1093/rpd/ncq372 (2010)	2010	Radiat. Prot. Dosim.,	0,85714	1
919	E26 -A 39	DFVM	**Saizu M.A**. &CMS tracker group Stand-Alone Cosmic Muon Reconstruction Before, Installation of CMS Silicon Strip tracker, **J. Instrum**., 4 P05004 (2009)	2009	Journal of Instrumentation	2,12230	5
920	E26 -A 40	DFVM	**Saizu M.A.** &CMS tracker group Performance Studies Of The CMS Strip Tracker Before, Installation , **J. Instrum**, 4 P06009 (2009)	2009	Journal of Instrumentation	2,12230	3
921	E26 -A 41	DFVM	**Corina Simion**, **Niculina Paunescu, Nicolae Mocanu, Romeo Calin, Sorin Bercea, Bogdan Mitrica;** "Ultra low radiation background LSC measurements in a salt mine: a feasibility study"; Journal of Labelled Compounds and Radiopharmaceuticals	2009	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	0
922	E26 -A 41	DFVM	**Saizu M.A.** &CMS tracker group Alignement Of CMS Silicon Strip Tracker During Stand-Alone Commissioning, **J. Instrum**, 4 T0T001 (2009)	2009	Journal of Instrumentation	2,12230	1
923	E26 -A 42	DFVM	**Saizu M.A.** &CMS tracker group The CERN Large Hadron Collider: Accelerator and Experiments : The CMS experiment at the CERN LHC, **J. Instrum**, 3 S08004 (2008)	2008	Journal of Instrumentation	2,12230	0
924	E26 -A 43	DFVM	**Saizu M.A.** &CMS tracker group The CMS Tracker Operation and Performance at the Magnet Test and Cosmic Challenge, **J. Instrum**, 3 P07006 (2008)	2008	Journal of Instrumentation	2,12230	0
925	E26 -A 63	DFVM	**Margineanu R., Simion C.,** Bercea S., Duliu O.G., **Gheorghiu D.,** The Slanic Prahova (ROMANIA) underground low-background radiation laboratory, **Appl. Radiat. Isotopes**, 66, 1501-1506 (2008)	2008	Applied Radiations and Isotopes	1,08857	0
926	E26 -A 64	DFVM	**Margineanu R.**, Mitrica B., **Apostu A., Gomoiu C.**, Traces of radioactive (131)I in rainwater and milk samples in Romania, **Environ. Res. Lett.**, 6, 3, 10.1088/1748-9326/6/3/034011 (2011)	2011	Environ. Res. Lett.	2,89950	0

927	E27 -A 2	DRMR	M-M.Be, B.Chauvenet,M-N.Amiot, C.Bobin, M-C Lepy,T.Branger, I.Laniece, **A.Luca, M.Sahagia**, **A.C.Watjen**, K.Kossert, O.Ott, O.Nahle, P.Dryak, J.Sochorova,P.Kovar, P.Auerbach, T.Altzitzoglou, S.Pomme, G.Sibbens, S.Van Ammel, J.Paepen, A.Iwahara, J.U.Delgado, R.Poledna, "International exercise on Sb-124 photon emission determination", Applied Radiat. Isot68,10, 2026-2030	2010	Applied Radiations and Isotopes	1,08857	0
928	E27 -A 3	DRMR	**M. Sahagia, A.C. Razdolescu, C. Ivan, A. Luca**, "Assurance of the traceability chain for I-131 measurements", Appl. Radiat. Isot. 66, 539-544.	2008	Applied Radiations and Isotopes	1,08857	0
929	E27 -A 4	DRMR	**C.Ivan**, P. Cassette, **M. Sahagia**, "A new TDCR-LS counter using channel photomultiplier tubes", Appl. Radiat. Isot. 66, 6-7, 1006 -1011	2008	Applied Radiations and Isotopes	1,08857	1
930	E27 -A 5	DRMR	**A.C.Razdolescu**, P. Cassette, **M.Sahagia**, "Measurements of a Fe-55 solution activity by LSC-TDCR method", Appl. Radiat. Isot. 66, 6-7, 750-755	2008	Applied Radiations and Isotopes	1,08857	0
931	E27 -A 6	DRMR	**M.Sahagia, C.Ivan, E.L.Grigorescu, A.C.Razdolescu**, "Standardization of I-125 by the coincidence method and practical applications", Appl. Radiat. Isot. 66, 6-7, 895-899	2008	Applied Radiations and Isotopes	1,08857	0
932	E27 -A 8	DRMR	B.Chauvenet, M-M.Be, M-N.Amiot, C.Bobin, M-C.Lepy, T.Branger, I.Laniece, **A.Luca, M.Sahagia, A.C.Watjen,** K.Kossert, O.Ott, O.Nahle, P.Dryak, J.Sochorova, P.Kovar, P.Auerbach, T.Altzizoglou, S.Pomme,G.Sibbens, R.Van Ammel, J. Paepen, A. Iwahara, J.V.Delgado, R. Poledna, C.J. da Silva, L. Johansson, A. Stroak, C. Bailat, Y. Nedjadi, P.Spring. "International exercise on Sb-124 activity measurement", Appl. Rad. Isotopes. 68, 1207-1210	2010	Applied Radiations and Isotopes	1,08857	0
933	E27 -A 9	DRMR	**M.Sahagia, A.C.Wätjen, A.Luca, C.Ivan.** "IFIN-HH ionization chamber calibration and its validation; electrometric system improvement" Appl. Radiat.Isot. 68, 1266 – 1269	2010	Applied Radiations and Isotopes	1,08857	0
934	E27 -A 10	DRMR	**A.Luca**. Evaluation of Th-234 nuclear decay data. Appl.Radiat.Isot.68(2010)1591-1594	2010	Applied Radiations and Isotopes	1,08857	0
935	E27 -A 11	DRMR	V. Olsovcova, A. Iwahara, P. Oropesa, L. Joseph, A. Ravindra, M.Ghafoori, H-K Son, **M. Sahagia,** S.Tastan, B. Zimmerman. National "Comparisons of I-131 measurement among nuclear medicine clinics of eight countries", Appl. Radiat.Isotopes 68, 1371 - 1377	2010	Applied Radiations and Isotopes	1,08857	1
936	E27 -A 12	DRMR	**C. Ivan, A.** C. Wätjen, P. Cassette, **M. Sahagia, A. Antohe,** E.L. Grigorescu, "Participation in the CCRI(II)-K2.H-3 comparison and study of the new TDCR-LS counter with 6 CPMs", Appl. Radiat. Isotopes. 68, 1543-1545	2010	Applied Radiations and Isotopes	1,08857	0
937	E27 -A 13	DRMR	**M.Sahagia, D.Stanga, A.C.Wätjen, A.Luca**, P.Cassette, **C.Ivan, A.Antohe**, "The Rn-222 standard system established at IFIN-HH, Romania", Appl.Radiat.Isot. 68, 1503 -150	2010	Applied Radiations and Isotopes	1,08857	0
938	E27 -A 14	DRMR	**A. Luca, R. Margineanu, M. Sahagia, A.C. Watjen**, "Activity measurements of technically enhanced naturally occuring radionuclides (TENORM) in phosphogypsum", Appl. Radiat.Isot. 67, 961-963.	2009	Applied Radiations and Isotopes	1,08857	7
939	E27 -A 15	DRMR	**M. Sahagia, A. Luca, A. C. Wätjen, A. Antohe, C. Ivan**, C.Varlam, I. Faurescu, P. Cassette, "Establishment of the Rn-222 traceability chain with the Romanian Standard System", Nuclear Instruments and Methods A 631, 73-79	2011	NUCL INSTR & METH IN PHYS RES A	1,02286	0
940	E27 -A 27	DRMR	**Luca A., Margineanu R.**, Sahagia M., WÃ¤tjen A.C., Activity measurements of technically enhanced naturally occurring radionuclides (TENORM) in phosphogypsum, **Appl. Radiat. Isotopes**, 67, 961-963 (2009)	2009	Applied Radiations and Isotopes	1,08857	0
941	E28 -A 3	DFVM	**Chiper D.**, **Lungu V., Barna C., Matei L., Radu M., Bubueanu G., Postolache C**., Bioaffinity of radiolabelled neurotensin agonist and antagonist to neurotensin receptors, **J. Labelled Comp. Rad.**, 53, 463-465 (2010)	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	8
942	E28 -A 4	DRMR	**Niculae D**., **Lungu V., Iliescu M.**, **Savu D.,** Investigations of direct labelling of anti-VEGF-mAb with Re-188, **J. Labelled Comp. Rad.**, 53, 275-279 (2010)	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	14
943	E28 -A 6	DRMR	**Niculae D., Iliescu M., Patrascu I.**, Vasilache R., **Mustaciosu C.,** Voicu G., Purice M., Receptor targeted lymphoscintigraphy using dextran derivatives labelled with (99m)Tc: in vivo preliminary biological evaluation, **J. Labelled Comp Rad.**, 53, 5-6, 398-402 (2010)	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	6
944	E28 -A 26	DRMR	**V.Lungu, D.Chiper,** R.Anghel, **C. Postolache, L.Matei, C. Barna, G. Bubueanu**, "In vitro studies with [methyl-3H]-thymidine regarding the effect of methyl donors cocktail in cancer therapy", J. Radioanal. and Nucl. Chemistry, 280, (2) 385-387	2009	Journal of Radioanalytical and Nuclear Chemistry	0,52000	25
945	E28 -A 29	DRMR	**Valeria Lungu , Diana Chiper,** Rodica Anghel, **Cristian Postolache, Lidia Matei, Catalina Barna, George Bubueanu** IN VIVO STUDIES WITH [METHYL-3H]-THYMIDINE REGARDING THE EFFECT OF METHYL DONORS COCKTAIL IN CANCER THERAPY, JOURNAL OF RADIOANALYTICAL AND NUCLEAR CHEMISTRY, VOLUME 280, NO2/MAY 2009, PAGES 385-387	2009	Journal of Radioanalytical and Nuclear Chemistry	0,52000	1
946	E28 -A 30	DRMR	**Valeria Lungu, Dana Niculae**, Penelope Bouziotis, Ioannis Pirmettis, Corneliu Podina - "Radiolabeled phosphonates for bone metastases therapy", Journal of Radioanalytical and Nuclear Chemistry, 273 (2007) 663-667	2007	Journal of Radioanalytical and Nuclear Chemistry	0,52000	0
947	E28 -A 31	DFVM	**Chiper D., Simion C.A., Borza V., Negoita N.,** Radiolabelling of thymine with Tc-99m. Preliminary results regarding the stability and biospecificity of [Tc-99m]thymine, **J. Labelled Compd. Rad**., 50 (5-6), 627-628 (2007)	2007	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	5
948	E28 -A 35	DRMR	**V Lungu, D Chiper, C Barna, L Matei, M Radu, Gh Bubueanu, C Postolache**, "Bioafinity of radiolabelled neurotensin agonist and antagonist to neurotensin receptors", J. Label Compd. Radiopharm 53, 463-465	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	6
949	E28 -A 37	DRMR	**V Lungu, D Chiper, L Matei, C Barna**, I Gruia, **C Tuta, C Postolache, C Cimpeanu**, "Radiolabelling of neurotensin agonist and antagonist with 177 Lu", J. Label Compd. Radiopharm 53, 466-468	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	1
950	E28 -A 43	DFVM	**Diana Chiper**, **Corina A Simion, Virginia Borza,** Nicolae Negoita, Radiolabelling of thymine with 99mTc. Preliminary results regarding the stability and biospecificity of [99mTc]thymine, Journal of labelled compounds and Radiopharmaceuticals, volume 50, issue 5-6, april-may 2007, pages 627-628	2007	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	1
951	E28 -A 44	DRMR	**Dana Niculae, Marina Iliescu, Ioana Patrascu,** Radu Vasilache, **Cosmin Mustaciosu,** Gabriela Voicu, Mariana Purice - "Receptor Targeted Lymphoscintigraphy using Dextran Derivatives Labelled with 99mTc: In Vivo Preliminary Biological Evaluation", Journal of Radiolabelled Compounds and Radiopharmaceuticals, 53 (2010) 398-402	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	1
952	E28 -A 45	DRMR	**Dana Niculae, Valeria Lungu**, Rodica Anghel, Iuliana Gruia, **Marina Iliescu** - "Labelling of Anti-Epidermal Growth Factor Monoclonal Antibody with 177Lu: Radiochemical and Biological Evaluation", Journal of Radiolabelled and Radiopharmaceuticals, 53 (2010) 355-359	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	4
953	E28 -A 46	DRMR	**Dana Niculae, Valeria Lungu, Marina Iliescu, Diana Savu** - "Investigation of Direct Labelling of Anti-VEGF-Mab with Re-188", Journal of Radiolabelled and Radiopharmaceuticals, 53 (2010) 275-279	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	7
954	E28 -A 47	DRMR	**Valeria Lungu, Dana Niculae**, Marieta Panait, **Diana Chiper** - "177Lu-DOTA-Tyr3-TATE radiotherapy experiments using animal models. Flow cytometric analysis in evaluation of therapeutic effect", Journal of Radiolabelled and Radiopharmaceuticals, 50 (2007) 489-491	2007	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	7
955	E28 -A 48	DRMR	**Valeria Lungu, Diana Chiper, Dana Niculae** - "Radiolabelling of meso-2,3-DMSA with 177Lu. Preliminary results regarding the stability and biospecificity of 177Lu-DMSA", Journal of Labelled Compound and Radiopharmaceuticals, 50 (2007) 565-566	2007	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	34
956	E28 -A 49	DRMR	**Valeria Lungu, Dana Niculae** - "Radiolabelling of somatostatin analogues lanreotide and octreotate with therapeutic radionuclides", Journal of Labelled Compound and Radiopharmaceuticals, 50 (2007) 588-589	2007	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	3
957	E29 -A 7	DRMR	**Borza V.N., Neacsu E., Mustaciosu C., Luca A., Barna C.,** Popescu N., Mercioniu I., Pal A., Hurduc A., Moldovan L., Savi Gh.P., Savi II, Matei L., Rhenium-188 labelled albumin microspheres for therapy of liver tumors, **J. Labelled Comp Rad.**, 53, 5-6, 470-471 (2010)	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	4

958	E29 -A 16	DRMR	**C. Postolache, Lidia Matei**, "Evaluation of fundamental processes in macromolecular structures radiolysis using quantum-chemical methods", Radiation Physics and Chemistry 76 1267-1271	2007	Radiation Physics and Chemistry	1,00000	0
959	E29 -A 17	DRMR	**Lidia Matei, Cristian Postolache**, "Radiolysis of polytetraflouorethylene and polystyrene catalytic supports in presence of tritiated water", Radiation Physics and Chemistry, 76, 1257-1262	2007	Radiation Physics and Chemistry	1,00000	0
960	E29 -A 18	DRMR	**Lidia Matei, C Postolache**, "Refurbishment of the Tritium Laboratory from NIPNE Romania", Fusion Science and Technology, 60, 3, 1021-1024	2011	Fusion Science and Technology	0,81429	1
961	E29 -A 19	DRMR	**C. Postolache**, Rodica Georgescu, **Lidia Matei**, "Determination of Tritiated Water Activity Using EPR Spectrometry", Fusion Science and Technology, 60, 3, 990-993	2011	Fusion Science and Technology	0,81429	3
962	E29 -A 20	DRMR	**Lidia Matei, C. Postolache, C Tuta**, S Brad, "Facility for Endurance Testing of Hydrophobic Isotope Exchange Catalysts", Fusion Science and Technology, 60,No 4, 1419-1422	2011	Fusion Science and Technology	0,81429	3
963	E29 -A 21	DRMR	S. Brad, I. Stefanescu, L. Stefan, A. Lazar, M Vijulie, N Sofilca, A.Bornea, F. Vasut, M. Zamfirache, N. Bidica, **C. Postolache, L. Matei**, "Experimental Stand for studies of hydrogen isotopes permaeation", Fusion Science and Technology, 54, 530-532	2008	Fusion Science and Technology	0,81429	1
964	E29 -A 22	DRMR	**Lidia Matei, C. Postolache**, I. Cristescu, S. Brad, "Behavior of Nafion perfluorosulfonate ionomer membranes in presence of tritiated water", Fusion Science and Technology, 54, 475-478	2008	Fusion Science and Technology	0,81429	15
965	E29 -A 22	IRASM	**Postolache C., Matei L. and Georgescu R**, Self-radiolytical processes in ethyl-phenyl siloxanes labeled with tritium, **Journal of Radioanalytical and Nuclear Chemistry**, 280(2): 251-258, 2009	2009	Journal of Radioanalytical and Nuclear Chemistry	0,52000	5
966	E29 -A 23	DRMR	**Lidia Matei, Cristian Postolache**, "Tritium Laboratory with Multiple Purposes at NIPNE Magurele", Fusion Science and Technology, 54, 149-152	2008	Fusion Science and Technology	0,81429	13
967	E29 -A 24	DRMR	**Lidia Matei, C. Postolache, G. Bubueanu**, C. Podina, "Synthesis of Labeled Compounds using Recovered Tritium from Expired Beta Light Sources", Fusion Science and Technology, 54, 643-646	2009	Fusion Science and Technology	0,81429	14
968	E29 -A 24	IRASM	**Postolache C, Matei L and Georgescu R**, Determination of tritium distribution in labeled compounds using EPR spectrometry, **Fusion Science and Technology**, 54(2): 639-642, 2008	2008	Fusion Science and Technology	0,81429	2
969	E29 -A 25	DRMR	C. **Postolache, Lidia Matei**, Rodica Georgescu, "Determination of tritium distribution in labeled compounds using EPR Spectrometry", Fusion Science and Technology, 54, 639-642	2008	Fusion Science and Technology	0,81429	0
970	E29 -A 27	DRMR	**L. Matei**, C. Tanase, **C. Postolache, G. Bubueanu**, C. Podina, "Synthesis of [1,2-T2] -nandrolon for RIA kits", Journal of Radioanalytical and Nuclear Chemistry 280, 2, 325-328	2009	Journal of Radioanalytical and Nuclear Chemistry	0,52000	1
971	E29 -A 28	DRMR	**C. Postolache, L. Matei**, R. Georgescu, "Self-radiolytical processes in ethyl-phenyl siloxanes labeled with tritium", Journal of Radioanalytical and Nuclear Chemistry 280, 2, 251-258	2009	Journal of Radioanalytical and Nuclear Chemistry	0,52000	2
972	E29 -A 31	DRMR	**Borza, V.N.N, Neacsu E.G., Postolache C.I., Matei L**, "Development of an immunoradiometric assay (IRMA) kit for determination of thyroid stimulating hormone in dry blood spot of newborns", Journal of Labelled Compounds and Radiopharmaceuticals, 50, 422-423	2007	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	0
973	E29 -A 32	DRMR	**Lidia Matei, Cristian Postolache**, Corneliu Podina, "Preparation of 3H-labelled Testosterone Metabolites", Journal of Labelled Compounds and Radiopharmaceuticals, 50, 442-443	2007	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	3
974	E29 -A 33	DRMR	**Cristian Postolache**, Constantin Tanase, **Lidia Matei, Violeta Serban**, "Synthesis of [5-3H]Uracil Nucleoside Analogue", Journal of Labelled Compounds and Radiopharmaceuticals, 50, 609-610	2007	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	4
975	E29 -A 34	DRMR	**Cristian Postolache, Lidia Matei** "Synthesis of (a-T) polyacrilyc acid", , Journal of Labelled Compounds and Radiopharmaceuticals, 50, 444-446	2007	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	0
976	E29 -A 36	DRMR	**L. Matei**, I Neagoe, **C Postolache**, V Tanase, G Bubueanu, G Manda, "In vitro and in vivo radiometrical studies evaluation of new nucleotide analogue behavior", J. Label Compd. Radiopharm 53, 294-299	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	2
977	E29 -A 38	DRMR	**C. Postolache, Lidia Matei,** C. Tanase, **G.Bubueanu**, "Synthesis Of E-275 Class Nucleoside Analogue By Isotope Exchange Technique" J. Label Compd. Radiopharm. 53, 461-463	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	0
978	E29 -A 39	DRMR	**C. Postolache, Lidia Matei,** "Synthesis of N Phenylsuccinimide-T2 1,4 Diphenylbuthane-T8 and 1,4 Diphenyl-2-buthene-T6",J. Label Compd. Radiopharm 53, 459-461	2010	Journal of Radiolabelled Compounds and Radiopharmaceuticals	0,46985	1
979	E29 -A 40	DRMR	**V.Borza, E.Neacsu, C. Mustaciosu, A.Luca, C.Barna**, **N.Popescu**, I. Mercioniu, Pal Albert, A.Hurduc, L.Moldovan, Ghe.Savi, I.Savi, L.Matei – "Rhenium-188 labelled albumin microspheres for therapy of liver tumors", Journal Radiolabelled Compounds and Radiopharmaceuticals 53 (2010) 470-471	2010	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	0
980	E29 -A 50	DRMR	A.Scarisoreanu, F.Scarlat, **S.Bercea**, R.Popa; "Calibration method for dosimetric films", vol.4, no6,p 871-876	2010	J OPTOELECTRON ADV M	0,32990	1
981	E30 -A 1	DFNA	**Em. Cincu**, D. Barbos, **I. Manea**, V. Manu, The advantageous way of getting the lowest uncertainty values of elemental concentration by INAA, **Journal of Radioanalitycal and Nuclear Chemistry**, 271, 655, 2007	2007	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	24
982	E30 -A 2	DFNA	**Em. Cincu, I. Manea,** V. Manu, D. Barbos, O. Sima, I. Gustavsson, P. Vermaercke, N. Vajda, Zs. Molnar, H. Polkowska-Motrenko, Comparative performance of INAA and other spectroscopy techniques in the elemental analysis of stainless steel materials, **Journal of Radioanalitycal and Nuclear Chemistry**, 274, 199, 2007	2007	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	3
983	E30 -A 3	DFNA	**Em. Cincu, L. Craciun, Ioana Manea-Grigore, I.L. Cazan,** V. Manu, D. Barbos, A.Cocis, Application of the INAA technique for elemental analysis of metallic biomaterials used in dentistry, **Applied Radiation and Isotopes**, 67, 2133, 2009	2009	Applied Radiation and Isotopes	1,08857	33
984	E30 -A 4	DFNA	LHCb Collaboration,…, **F. Constantin, C. Pavel,** Measurement of V(0) production ratios in pp collisions at root s=0.9 and 7 TeV, **Journal of High Energy Physics,** 034, 1108 , 2011	2011	J HIGH ENERGY PHYS	1,67711	1
985	E30 -A 5	DFNA	LHCb Collaboration,…, **F. Constantin, C. Pavel** ,Search for the rare decays B(s)(0) -> mu(+)mu(-) and B(0) -> mu(+)mu(-), **Physics Letters B**, 699, 330, 2011,	2011	PHYSICS LETTERS B	3,62428	6
986	E30 -A 7	DFNA	LHCb Collaboration,…, **F. Constantin, C. Pavel- Nicorescu**, First observation of B(s)(0) -> J/psi f(0)(980) decays, **Physics Letters B**, 698, 115, 2011	2011	PHYSICS LETTERS B	3,62428	9
987	E30 -A 8	DFNA	LHCb Collaboration,...,**F. Constantin, C. Pavel**, First observation of (B)over-bar(s)(0) -> D(s2)*(+)X mu(-)(nu)over-bar decays, **Physics Letters B**, 698, 14, 2011	2011	PHYSICS LETTERS B	3,62428	19
988	E30 -A 9	DFNA	LHCb Collaboration,...,**F. Constantin, C. Pavel,** First observation of (B)over-bar(s)(0) -> D(s2)*(+)X mu(-)(nu)over-bar decays, **Physics Letters B**, 694, 209,2010	2010	PHYSICS LETTERS B	3,62428	7
989	E30 -A 10	DFNA	LHCb Collaboration,...,**F. Constantin, C. Pavel,** Prompt K(S)(0) production in pp collisions at root s=0.9 TeV, **Physics Letters B**, 693,69, 2010	2010	PHYSICS LETTERS B	3,62428	12
990	E30 -A 11	DFNA	**F. Constantin, C. Pavel, R. Bugoi,** M. Toderas, An X-ray tomograph based on a flat panel detector, **Nuclear Instruments and Methods in Physics Research A**, 621, 685, 2010	2010	NUCL INSTR & METH IN PHYS RES A	1,02286	3
991	E30 -A 13	DFNA	LHCb Collaboration,…, **F. Constantin, C.Pavel,** The LHCb Detector at the LHC, **Journal of Instrumentation**, 3, 1748, 2008	2008	Journal of Instrumentation	2,12230	0

992	E30 -A 25	DFNA	**Eugeniu Ivanov; Ion Vata ; Dorin Dudu; Ion Rusen; Nitisor Stefan**, Quantum beats in the 3 gamma annihilation decay of Positronium observed by perturbed angular distribution Quantum beats in the 3 gamma annihilation decay of Positronium observed by perturbed angular distribution, **Applied Surface Science**, 255, 179, 2008	2008	Applied Surface Science	1,32057	0
993	E30 -A 26	DFNA	**Eugeniu Ivanov; Ion Vata ; Stefan Todorian; Dorin Dudu; Ion Rusen; Nitisor Stefan**, Capillary condensation in porous alumina observed by positronium lifetime spectroscopy, **Applied Surface Science**, 255, 194, 2008	2008	Applied Surface Science	1,32057	0
994	E30 -A 27	DFNA	M. Balaceanu, V. Braic, M. Braic, M. A. Kiss, C.N.Zoita, A. Vladescu, P.Drob, C. Vasilescu, **D. Dudu, O. Muresan**, Structural, mechanical and corrosion properties of TiOxNy/ZrOxNy multilayer coatings, **Surface & Coatings Technology**, 202, 2384, 2008	2008	Surface & Coatings Technology	1,46890	0
995	E30 -A 40	DFNA	**Eugeniu Ivanov, Ion Vata, Stefan Teodorian, Ion Rusen, Nitisor Stefan**, Interaction of positronium atoms, with paramagnetic molecules, measured by perturbed angular distribution in 3gamma annihilation decay, **Nuclear Instruments and Methods in Physics Research B**, 267, 347, 2009 by perturbed angular distribution in 3c annihilation decay,	2009	Nuclear Instruments and Methods in Physics Research B	0,95429	1
996	E31 -A 23	DFNA	**I. Cruceru, G. Nicolescu,** O.G. Duliu, O. G., A dedicated torsion balance to detect neutrinos by coherent scattering on high debye temperature monocrystals, **International Journal of Modern Physics A**, 23, 1719, 2008	2008	International Journal of Modern Physics A	0,39148	0
997	E31 -A 37	DFNA	**G. Nicolescu, E.A. Ivanov, D. Plostinaru**, Electric quadrupole moments of 17/2(-) and 13/2(-) subsequent isomers in (209)Po, **Physical Review C**, 79, 2009	2009	Physical Review C	1,24767	0
998	E32 -A 12	DFNA	**Angela Vasilescu, L. Craciun, Ionica A. Ghita, O. Constantinescu, F. Constantin, Catalina Chiojdeanu,** C.N. Zoita, **P.M. Racolta,** Status of an R&D project of a positron gun at "Horia Hulubei" NIPNE Bucharest, **Applied Surface Science**, 255, 46, 2008	2008	Applied Surface Science	1,32057	0
999	E32 -A 14	DFNA	**Bogdan Constantinescu, Angela Vasilescu**, Martin Radtke and Uwe Reinholz, A study on gold and copper provenance for Romanian prehistoric objects using micro-SR XRF, **Journal of Analytical Atomic Spectrometry**, 26, 917, 2011	2011	Journal of Analytical Atomic Spectrometry	1,65051	0
1000	E32 -A 15	DFNA	**Constantinescu Bogdan**; Oberlaender-Tarnoveanu Ernest; **Bugoi Roxana**; Cojocaru, Viorel ; Radtke, Martin, The Sarmizegetusa bracelets, **Antiquity**, 84 , 1028, 2010	2010	Antiquity	0,677	0
1001	E32 -A 16	DFNA	**Bogdan Constantinescu · Angela Vasilescu ·** Martin Radtke · Uwe Reinholz, Micro-SR-XRF studies for archaeological gold identification-the case of Carpathian gold and Romanian museal objects, **Applied Physics A- Materials Science & Processing,** 99**,** 383, 2010	2010	Applied Physics A- Materials Science & Processing	1,45182	0
1002	E32 -A 17	DFNA	**Constantinescu B.; Bugoi R.**; Cojocaru V.; Simon, R.; Grambole, D.; Munnik, F.; Oberlander-Tarnoveanu, E., Elemental analysis through X-ray techniques applied in archeological gold authentication - the case of Transylvanian gold and of the Dacian bracelets, **Spectrochimica Acta Part B - Atomic Spectroscopy**, 64, 1198, 2009	2009	Spectrochimica Acta Part B - Atomic Spectroscopy	1,45908	0
1003	E32 -A 18	DFNA	**Angela Vasilescu, B. Constantinescu, Roxana Bugoi,** D. Ceccato, D. Grambole, F. Herrmann, Micro-elemental analysis of some Transylvanian meteorites and lunar samples, **Nuclear Instruments and Methods in Physics Research A**, 267, 2233, 2009	2009	NUCL INSTR & METH IN PHYS RES A	1,02286	1
1004	E32 -A 19	DFNA	**Roxana Bugoi, Bogdan Constantinescu,** Emmanuel Pantos; Dragomir Popovici, Investigation of Neolithic ceramic pigments using synchrotron radiation X-ray diffraction, **Powder Diffraction**, 23, 195, 2008	2008	Powder Diffraction	0,96858	5
1005	E32 -A 20	DFNA	**Roxana Bugoi, Viorel Cojocaru ,Bogdan Constantinescu,** Thomas Calligaro, Laurent Pichon, Stefan Rohrs, Joseph Salomon, Compositional studies on Transylvanian gold nuggets: Advantages and limitations of	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	0
1006	E32 -A 21	DFNA	B. **Constantinescu, R. Bugoi**, V. Cojocaru, M. Radtke, T. Calligaro, J. Salomon, L. Pichon, S. Rohrs, D. Ceccato, E. Oberlander-Tarnoveanu, Micro-SR-XRF and micro-PIXE studies for archaeological gold identification - The case of Carpathian (Transylvanian) gold and of Dacian bracelets, **Nuclear Instruments and Methods in Physics Research B**, 266, 2325, 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	2
1007	E32 -A 22	DFNA	**B. Constantinescu, R. Bugoi,** E.R. Hodgson, R. Vila, P. Loan, Studies on proton irradiation-induced modifications of KUI and KS-4V quartz glasses ultraviolet transmission properties, **Journal of Nuclear Materials**, 367, 1048, 2007	2007	Journal of Nuclear Materials	2,44928	2
1008	E32 -A 38	DFNA	Antonela Neacsu, C. Popescu Gheorghe, **Bogdan Constantinescu** et al., The Geochemical signature of native gold from Rosia Montana and Musariu ore deposits metaliferi MTS., **Carpathian Journal of Earth and Environmental Science**, 4, 49, 2009	2009	Carpathian Journal of Earth and Environmental Science	0,08040	26
1009	E32 -A 39	DFNA	K. Szamota-Leandersson, **R. Bugoi**, M. Gothelid, G. Lelay, U.O.Karlsson, Pb induced charge accumulation on InAs(111)B, **Surface Science**, 601, 3246, 2007	2007	Surface Science	1,308	1
1010	E33 -A 28	DFNA	**M. Dogaru,** Mihaela Antonina Calin, **C. Stan-Sion,** Tritium measurements by AMS and applications, **Journal of Radioanalitycal and Nuclear Chemistry**, 288, 491, 2011	2011	Journal of Radioanalitycal and Nuclear Chemistry	0,52000	17
1011	E33 -A 29	DFNA	**C. Stan-Sion, M. Enachescu, O. Constantinescu, M.Dogaru**, A decade of experiments and recent upgrading at the AMS facility in Bucharest, **Nuclear Instruments and Methods in Physics Research B**, 268, 863, 2010	2010	Nuclear Instruments and Methods in Physics Research B	0,95429	2
1012	E33 -A 30	DFNA	Anulli F.; Ciapetti G.; **M. Dogaru;** De Pedis D.; et al., The Level-1 Trigger Muon Barrel System of the ATLAS experiment at CERN, **Journal of Instrumentation**, 4, 2009	2009	Journal of Instrumentation	2,12230	0
1013	E33 -A 31	DFNA	Solfaroli E.; Aielli G.; Aloisio A. **M.Dogaru**; et al., First cosmic ray results of the RPC commissioning in the ATLAS cavern, **Nuclear Instruments and Methods in Physics Research B**, 177, 335, 2008	2008	Nuclear Instruments and Methods in Physics Research B	0,95429	0
1014	E33 -A 32	DFNA	Aielli G.; Aloisio A.; Alviggi M. G.,**M.Dogaru**; et al., Status of the ATLAS level-1 central trigger and muon barrel trigger and first results from cosmic-ray data, **IEEE Transactions on Nuclear Science**, 55, 139, 2008	2008	IEEE Transactions on Nuclear Science	1,06286	0
1015	E33 -A 33	DFNA	Chiodini G.; Aielli G.; Aloisio A.,**M. Dogaru**; et al., RPC cosmic ray tests in the ATLAS experiment, **Nuclear Instruments and Methods in Physics Research A**, 581, 213, 2007	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	3
1016	E33 -A 34	DFNA	Aielli G.; Andrei V.; Achenbach R., **M.Dogaru**; et al., The ATLAS level-1 trigger: Status of the system and first results from cosmic-ray data, **Nuclear Instruments and Methods in Physics Research A**, 581, 476, 2007	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	2
1017	E33 -A 35	DFNA	**C. Stan-Sion,** J. Roth, K. Krieger, **M. Enachescu**, K.Ertl, V. Lazarev, H.Reithmeier, E. Nolte, AMS - Sensitive tool used as nuclear safeguard and to diagnose fusion experiments, **Nuclear Instruments and Methods in Physics Research B,** 259, 694, 2007	2007	Nuclear Instruments and Methods in Physics Research B	0,95429	8

1018	E33 -A 36	DFNA	**C. Stan-Sion,** A. Letourneau, H. Reithmeier, **M. Enachescu**, V. Lazarev, E. Nolte, AMS measurement of the neutron capture cross-section Bi-209(n, gamma) Bi-210m, **Nuclear Instruments and Methods in Physics Research B**, 259, 739, 2007	2007	Nuclear Instruments and Methods in Physics Research B	0,95429	9
1019	E34 -A 1	IRASM	E. S. Teodor, E. D. Teodor, **M. Virgolici, M. Manea**, G. Truica, S. C. Litescu, Non-destructive analysis of amber artefacts from prehistoric Cioclovina hoard (Romania), **Journal of Archaeological Science**, 37 (10), 2386-2396, 2010	2010	Journal of Archaeological Science	1,57	1
1020	E34 -A 2	IRASM	**M. Virgolici, C. Ponta, M. Manea, D. Negut, M. Cutrubinis, I. Moise, R. Suvaila**, E. Teodor, C. Sarbu and A. Medvedovici, Thermal Desorption / Gas Chromatography / Mass Spectrometry approach for characterization of the volatile fraction from amber specimens: a possibility of tracking geological origins, **Journal of Chromatography A**, 1217(12):1977-1987, 2010	2010	Journal of Chromatography A	1,65	1
1021	E34 -A 3	IRASM	**M. Virgolici,** I. Petroviciu, E. Teodor, S. Litescu, **M. Manea, C. Ponta**, Gh. Niculescu, C. Sarbu, A. Medvodovici, TD/CGC/MS and FT-IR characterization of archaeological amber artefacts from Roumanian collections (Roman age), **Revue Roumaine de Chimie**, 55(5): 349-355, 2010	2010	Revue Roumaine de Chimie	0,14956	0
1022	E34 -A 4	IRASM	**M. M. Manea, I. V. Moise, M. Virgolici, C. D. Negut**, O.-H. Barbu, **M. Cutrubinis**, V. Fugaru, **I. R. Stanculescu and C. C. Ponta**, Spectroscopic evaluation of painted layer structural changes induced by	2011	Radiation Physics and Chemistry	1,00000	1
1023	E34 -A 5	IRASM	**M. Virgolici**, A.V. Medvedovici, **M.M. Manea, M. Cutrubinis, I.V. Moise and R. Georgescu**, A study on optimization the sample preparation for gas chromatographic methods used in routine irradiated foodstuffs detection, **Nukleonika** (International Journal of Nuclear Research), 54(2):115-121, 2009	2009	Nukleonika	0,1481	6
1024	E34 -A 6	IRASM	**E. Bratu, I.V. Moise, M. Cutrubinis, D.C. Negut and M. Virgolici**, Archives decontamination by gamma irradiation, **Nukleonika** (International Journal of Nuclear Research), 54(2):77-84, 2009	2009	Nukleonika	0,1481	2
1025	E34 -A 7	IRASM	R. Bedogni, A. Esposito, G. Lovestam, M.J. Garcia, **M. Virgolici**, The new PADC based fast neutron dosimetry system of the INFN-LNF, **Radiation Measurements**, 43(Suppl. 1): S491-S494, 2008	2008	Radiation Measurements	1,27714	0
1026	E34 -A 8	IRASM	V.Bercu, **C.D. Negut**, O.G. Duliu, EPR studies of the free radical kinetics in gamma-rays irradiated Pleurotus ostreatus oyster mushrooms, **Food Research International**, 44: 1008-1011, 2011	2011	Food Reasearch International	2,21	19
1027	E34 -A 9	IRASM	V. Bercu, **C.D. Negut**, O.G. Duliu, EPR investigation of some desiccated Ascomycota and Basidiomycota gamma-irradiated mushrooms, **Radiation Physics and Chemistry**, 79: 1275-1278, 2010	2010	Radiation Physics and Chemistry	1,00000	1
1028	E34 -A 10	IRASM	T. E. Sesan, F. Oancea, C. Toma., G. M. Matei, S. Matei, D. Chira, F. Chira, E. Fodor, C. Mocan, **M. Ene., M. Alexandru**, Approches on mycorrhizas in Romania, **Symbiosis**, 52(2-3): 75-85, 2010	2010	Symbiosis	0,7573	0
1029	E34 -A 11	IRASM	**M. Ene , L. Trandafir, M. Alexandru**, Effect of gamma irradiation on plants in interaction with arbuscular mycorrhizae, **Nukleonika** (International Journal of Nuclear Reasearch), 54(2): 89-92, 2009	2009	Nukleonika	0,3446	9
1030	E34 -A 12	IRASM	**M. Alexandru, M. Ene**, Sterilization validation for medical compresses at IRASM multipurpose irradiation facility, **Radiation Physics and Chemistry**, 76(8-9): 1547-1550, 2007	2007	Radiation Physics and Chemistry	1,00000	0
1031	E34 -A 13	IRASM	M. Secu, C.E. Secu, S. Jipa, T. Zaharescu, **M. Cutrubinis**, High temperature thermoluminescence of Mn2+-doped MgF2 phosphor for personal dosimetry, **Radiation Measurements**, 43(2-6):383-386, 2008	2008	Radiation Measurements	1,27714	0
1032	E34 -A 14	IRASM	M. Secu, S. Jipa, C. E. Secu, T. Zaharescu, **R. Georgescu, M. Cutrubinis**, Processes involved in the high-temperature thermoluminescence of a Mn2+ doped MgF2 phosphor, **Physica Status Solidi B**, 245(1): 159-162, 2008	2008	Physica Status Solidi B	0,94051	1
1033	E34 -A 15	IRASM	**M. Cutrubinis, D. Chirita, D. Savu,** C. E. Secu, **R. Mihai,** M. Secu, **C. Ponta,** Preliminary study on detection of irradiated foodstuffs from the Romanian market, **Radiation Physics and Chemistry**, 76(8-9): 1450-1454, 2007	2007	Radiation Physics and Chemistry	1,00000	1
1034	E34 -A 16	IRASM	Rosu T, Pahontu E, Maxim C, **Georgescu R** , Stanica N and Gulea A, Some new Cu(II) complexes containing an ON donor Schiff base: Synthesis, characterization and antibacterial activity, **Polyhedron**, 30: 154-162, 2011	2011	Polyhedron	1,09	4
1035	E34 -A 17	IRASM	M. Calinescu, T. Negreanu-Parjol**, R. Georgescu** and O. Calinescu, Synthesis and characterization of new copper(II) complex compounds with chlorhexidine. Part I, **Central European Journal of Chemistry**, 8: 543-549, 2010	2010	Central Eur. J. Phys.	0,48339	0
1036	E34 -A 18	IRASM	Negoiu M, Pasculescu S , Rosu T , **Georgescu R** and Draghici C, Synthesis and Characterisation of Complex Cu(II) Combinations with Schiff base Ligands derived from 4-amino-1-phenyl-2,3-dimethyl-3-pyrazole-5-one (4-amino-antipyrine) and Pentaatomic Heterocyclic Aldehydes, **Revista de chimie**, 61: 762-766, 2010	2010	Revue Roumaine de Chimie	0,14956	0
1037	E34 -A 19	IRASM	T. Rosu, E. Pahontu, C. Maxim, **R. Georgescu**, N. Stanica, G. L. Almajan and A. Gulea, Synthesis, characterization and antibacterial activity of some new complexes of Cu(II), Ni(II), VO(II), Mn(II) with Schiff base derived from 4-amino-2,3-dimethyl-1-phenyl-3-pyrazolin-5-one, **Polyhedron**, 29: 757-766, 2010	2010	Polyhedron	1,09	3
1038	E34 -A 20	IRASM	T. Rosu, E. Pahontu, S. Pasculescu, **R. Georgescu**, N. Stanica, A. Curaj, A. Popescu, M. Leabu, Synthesis, characterization antibacterial and antiproliferative activity of novel Cu(II) and Pd(II) complexes with 2-hydroxy-8-R-tricyclo[7.3.1.0.(2,7)] tridecane-13-one thiosemicarbazone, **European Journal of Medicinal Chemistry**, 45: 1627-1634, 2010	2010	European Journal of Medicinal Chemistry	1,61	1
1039	E34 -A 21	IRASM	Irina Mateescu, Serban Georgescu, Brandusa Iliescu, Ionut Enculescu, **Rodica Georgescu**, Constantin Oproiu, and Georgiana Ghita, Influence of ionizing radiations (electrons and gamma) on the electrical characteristics of LGS resonators, **Ferroelectrics**, 389: 25-31, 2009	2009	Ferroelectrics	0,36831	2
1040	E34 -A 23	IRASM	M. Nae, D. Gazdaru, A. Acasandrei, **R. Georgescu, B. M. Macri and M. Radu**, A fluorescence approach of the gamma radiation effects on gramicidin A inserted in liposomes, **Journal of Peptide Science**, 14(9): 1003-1009, 2008	2008	Journal of Peptide Science	1,07	5
1041	E34 -A 25	IRASM	Calinescu M., Ion E., Emandi A., **Georgescu R.** and Negreanu-Pirjol T., Magnetic, Optical and Biological Studies on Copper(II) Complexes with 2-benzothiazolyl Hydrazones. II, **Revista de chimie**, 59(12): 1322-1326, 2008	2008	Revista de Chimie	0,1678	1
1042	E34 -A 26	IRASM	Calinescu M, Ion E, **Georgescu R**, Negreanu-Pirjol T, Synthesis, spectroscopic, antibacterial and antifungal studies on copper(II) complexes with 2-benzothiazolyl hydrazones, **Revue Roumaine de Chimie**, 53: 911-919, 2008	2008	Revue Roumaine de Chimie	0,14956	0
1043	E34 -A 27	IRASM	T. Rosu, A. Gulea, A. Nicolae and **R. Georgescu**, Complexes of 3dn Metal Ions with Thiosemicarbazones: Synthesis and Antimicrobial Activity, **Molecules**, 12: 782-796, 2007	2007	Molecules	0,9274	0
1044	E34 -A 28	IRASM	O. G. Duliu, **R. Georgescu**, S. Ibrahim Ali, EPR investigation of some traditional oriental irradiated spices, **Radiation Physics and Chemistry**, 76: 1031-1036, 2007	2007	Radiation Physics and Chemistry	1,00000	0

1045	E34 -A 29	IRASM	E. D. Seletchi, O. G. Duliu and **R. Georgescu**, EPR studies of gamma irradiated Rapana venosa (Gastropoda, Muricidae) shell, **Radiation Physics and Chemistry**, 76(10): 1650-1652, 2007	2007	Radiation Physics and Chemistry	1,00000	1
1046	E34 -A 30	IRASM	**M. Manea**, V. Chiosa, **I. Stanculescu**, C. Mandravel, IR spectral study on nature of 2-pyridine aldoxime methyl chloride interaction with some sterols. III. Lanosterol and 7-dehydrocholesterol, **Revue Roumaine de Chimie**, 54(5): 399-403, 2009	2009	Revue Roumaine de Chimie	0,14956	1
1047	E34 -A 31	IRASM	V. Chiosa, **M. Manea**, **I. Stanculescu**, C. Mandravel, IR spectral study on the nature of 2-pyridine aldoxime methyl chloride interaction with some sterols. II.Cholestanol, **Revue Roumaine de Chimie**, 52(8-9): 739-743, 2007	2007	Revue Roumaine de Chimie	0,14956	0
1048	E34 -A 32	IRASM	R. Done, **I. Stanculescu**, C. Mandravel, Actual trends in Threshold Limit Values evaluation: application to halogen containing compounds using multilinear regression method, **Revue Roumaine de Chimie**, 54: 749-753, 2009	2009	Revue Roumaine de Chimie	0,14956	1
1049	E34 -A 33	IRASM	**I. Stanculescu**, C. Bendic, In silico study of hydroxyl radical reaction with 1,2-dimethyl-1,2,3,4-tetrahydroisoquinolines, **Revue Roumaine de Chimie**, 54: 1071-1076, 2009	2009	Revue Roumaine de Chimie	0,14956	0
1050	E34 -A 34	IRASM	A. Olaru, **I. Stanculescu**, L.O. Cinteza, H. Weisssieker, P. Schaff, Removal of some chromium contaminants from aqueous solutions using PANI-alginate gel beads, **Fresenius Environmental Bulletin**, 18: 1851-1859, 2009	2009	Fresenius Environmental Bulletin	0,5117	15
1051	E35 -A 1	DMDR	O.G. Duliu, **C.I. Cristache,** G. Oaie, O.A. Culicov , M.V. Frontasyeva, **M. Toma**, ENAA Studies of Anoxic Black Sea Sediments, **Mar. Pollut. Bull**., 58, 827-831, (2009)	2009	Marine Pollution Bulletin	1,55236	6
1052	E35 -A 2	DMDR	**C.I. Cristache**, C.A. Simion, R. M. Margineanu, O.A. Culicov, M.V. Frontasyeva, M. Matei , O.G. Duliu, Epithermal neutrons activation analysis. Radiochemical and Radiometric investigations of evaporitic deposits of Slanic-Prahova (Romania) salt mine, **Radiochim. Acta**, 97(6), 333-337, (2009)	2009	Radiochimica Acta	1,13	1
1053	E35 -A 3	DMDR	**C.I. Cristache**, O.A. Culicov, M.V. Frontasyeva, C. Ricman, M. Toma, O.G. Duliu, Epithermal neutron activation ,radiometric, correlation and principal component analysis applied to the distribution of major and trace elements in some igneous and metamorphic rocks from Romania, **Appl. Radiat. Isotopes**, 67, 901-906, (2009)	2009	Applied Radiation and Isotopes	1,08857	3
1054	E35 -A 4	DMDR	O.G. Duliu, **C.I.Cristache**, O.A.Culicov, M.V.Frontasyeva, S.A.Szobotca, **M.Toma**, Epithermal neutrons activation analysis investigation of Clarion-Clipperton abyssal plane clay and polymetallic micronodules, **Appl. Radiat. Isotopes**, 67, 939-943, (2009),	2009	Applied Radiation and Isotopes	1,08857	0
1055	E35 -A 5	DMDR	R.M., Margineanu, A.M. Apostu,O.G. Duliu, S. Bercea, C.M. Gomoiu, **C.I. Cristache**, External Dose Rate In Unirea Salt Mine, Slanic-Prahova, Romania, **Appl. Radiat. Isotopes**, 67, 759-761, (2009)	2009	Applied Radiationand Isotopes	1,08857	0
1056	E35 -A 6	DMDR	**M.Toma**, O. Sima, **C.I. Olteanu**, Experimental and simulated studies for the calibration of a radioactive waste assay system, **Nucl. Instrum. Meth. A**, 580 (1), 391-395, (2007)	2007	NUCL INSTR & METH IN PHYS RES A	1,02286	0
1057	E35 -A 7	DMDR	N. Florea, **C.I. Cristache**, G.Oaie, O.G.Duliu, Concordant 210Pb and 137Cs ages of Black Sea Anoxic Unconsilidated Sediments, **Geochronometria**, 38(2), 101-106, (2011)	2011	Geochronometria	0,54328	0
1058	E35 -A 8	DMDR	**C. I. Cristache**, O. G. Duliu, K. Gmeling, O. Culicov, **M. Toma**, An ENAA and PGAA comparative study of anoxic Black Sea sediments, **J. Radioanal. Nucl. Ch**., 279(1), 7-12, (2009)	2009	Journal of Radioanalytical and Nuclear Chemistry	0,52000	37
1059	E35 -A 9	DMDR	V.N. Borza, **E.Neacsu**, C.Mustaciosu, A. Luca, C.Barna, N. Popescu, I. Mercioniu, P. Albert, A. Hurduc, L. Moldovan, G. P.Savi, I. Savi, L. Matei, Rhenium-188 labelled albumin microspheres for therapy of liver tumors, **J. Labelled Compd. Rad.** 53, 470-471, (2010),	2010	Journal of Labelled Coumpound and Radiopharmaceuticals	0,46985	13
1060	E35 -A 10	DMDR	E. Neacsu, C. Tuta, V. Borza, C. Mustata, and C. Podina, Determination of trace anions in water from the spent nuclear fuel wet storage, **J. Labelled Compd. Rad**., 52, 265 (2009)	2009	Journal of Labelled Coumpound and Radiopharmaceuticals	0,46985	6
1061	E35 -A 11	DMDR	V. N. Borza, **E. Neacsu**, C. Nistor, R. Ianchis, N. Popescu, I. Mercioniu, Human albumin nanospheres labelled with 99 mTC, **J. Labelled Compd. Rad**., 52, 263, (2009)	2009	Journal of Labelled Coumpound and Radiopharmaceuticals	0,46985	3
1062	E35 -A 12	DMDR	V.N. N. Borza , **E. V. Neacsu**, C.I. Postolache, L. C. Matei, Development of an immunoradiometric assay (IRMA) kit for determination of thyroid stimulating hormone in dry blood spot of newborns, **J. Labelled Compd. Rad**., 50 (5-6), 422- 423, (2007)	2007	Journal of Labelled Coumpound and Radiopharmaceuticals	0,46985	0
1063	E35 -A 42	DMDR	**E. Neacsu, C. Tuta, V. Borza**, C. Mustata, and C. Podina – "Determination of trace anions in water from the spent nuclear fuel wet storage", Journal Radiolabelled Compounds and Radiopharmaceuticals 52 (2009) 265	2009	Journal of Labelled Compounds and Radiopharmaceuticals	0,46985	0
1064	E36 -A 1	DDR	**Stanga, D.,** De Felice, P., Improvements in the absolute standardization of large-area reference sources, Appl. Rad. Isot. 67 (2009) 1716-1720	2009	Applied Radiation and Isotopes	1,08857	0
1065	E36 -A 2	DDR	Sahagia, M., **Stanga, D.,** Wätjen, A.M.C., Luca, A.., Cassette, P., Ivan, C., Antohe, A., The ^{222}Rn standard system established at IFIN-HH Romania, Appl. Rad. Isot. 68 (2010) 1503-1506	2010	Applied Radiation and Isotopes	1,08857	1
1066	E36 -A 3	DDR	**Stanga, D.**, Maringer, F.J., **Ionescu, E.,** A new method for determining the efficiency of large-area beta sources constructed from anodized aluminum foils, Appl. Rad. Isot. 69 (2011) 227–230	2011	Applied Radiation and Isotopes	1,08857	2
1067	E36 -A 4	DDR	**Gurau, D.,** Sima, O., Simulation studies of the response function of a radioactive waste assay system, Appl. Rad. Isot. (2011), doi:10.1016/j.apradiso.2011.08.018.	2011	Applied Radiation and Isotopes	1,08857	0
1068	E36 -A 5	DDR	**Radu, D., Stanga, D.**, Sima, O., ETNA software used for efficiency transfer from a point source to other geometries, Appl. Rad. Isot. 67 (2009) 1686–1690	2009	Applied Radiation and Isotopes	1,08857	5
1069	E36 -A 6	DDR	**Stanga, D., Radu, D.,** Sima, O., A new model calculation of the peak efficiency for HPGe detectors used in assays of radioactive waste drums, Appl. Rad. Isot. 68 (2010) 1418–1422	2010	Applied Radiation and Isotopes	1,08857	3
1070	SC12 -A 1	CTTM	**L. Radulescu**, M. Pavelescu, S. Bercea, F. Scarlat, "*Consideration referring to materials types able to be used in gas-cooled fast reactors*", JOAM Vol.12, No.12, December 2010, p.2442-2448	2010	JOAM	0,3299	1
					TOTAL:	1674,7	4153