

HNPS Advances in Nuclear Physics

Vol 24 (2016)

HNPS2016



Editorial Comments and Symposium Info

Organizing Committee Editorial Team

To cite this article:

Editorial Team, O. C. (2019). Editorial Comments and Symposium Info. *HNPS Advances in Nuclear Physics*, 24, i-x. Retrieved from <https://eproceedings.epublishing.ekt.gr/index.php/hnps/article/view/1883>

HELLENIC NUCLEAR PHYSICS SOCIETY

PROCEEDINGS

25th HELLENIC CONFERENCE

ON

NUCLEAR PHYSICS



**NATIONAL CENTRE FOR SCIENTIFIC RESEARCH
“DEMOKRITOS”**

3 & 4 JUNE 2016

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PREFACE

The present volume contains the Proceedings of the 25th Hellenic Conference on Nuclear Physics, held in the National Centre for Scientific Research “Demokritos”, on June 3 2016. The texts of the talks and posters are compiled as submitted by the authors. This conference followed a series of Hellenic Nuclear Physics Conferences that started in 1990 at Thessaloniki and since then, they are yearly held at different Greek academic institutions. The aim of this series of conferences is to offer the local nuclear physics community the opportunity to present and discuss their latest activities in theoretical and experimental nuclear physics and applications, sometimes in collaboration with colleagues from abroad and with the usage of facilities in Greece and abroad. It is also a unique forum for presentations by young colleagues, in the early stages of their careers.

The conference was organized under the auspices of the National Centre for Scientific Research “Demokritos”. The financial support offered by the Institutes of Nuclear and Particle Physics and Nuclear and Radiological Sciences, Technology, Energy and Safety, as well as ANTISEL S.A. is gratefully acknowledged. Moreover, the encouragement and assistance provided by the Hellenic Nuclear Physics Society Governing Board for the success of the Conference and the publication of the proceedings is also gratefully acknowledged. Finally, the assistance by several graduate and undergraduate students is also warmly appreciated.

Athens 2016

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25TH ANNUAL SYMPOSIUM OF THE HELLENIC NUCLEAR PHYSICS SOCIETY

SCIENTIFIC PROGRAM

Friday June 3rd, 2016

08:30 – 09:00 Registration
09:00 – 09:10 Welcome Addresses

| Time | Speaker | Affiliation | Title |
|-------------------|---|--------------------|---|
| 09:10 – 09:40 | Theo Zouros (Invited Speaker) | UoC | Atomic Physics with Accelerators: Projectile Electron Spectroscopy of highly charged ions at the 5.5MV Demokritos Tandem accelerator |
| SESSION 1: | Chair: Michael Kokkoris | NTUA | |
| 09:40 – 09:55 | Maria Zamani | AUTH | Triple fission events at high energies |
| 09:55 – 10:10 | Charalambos Moustakidis | AUTH | Speed of Sound Effects on the Upper Bound of Neutron Star Mass |
| 10:10 – 10:25 | George Koutelieris | NTUA | Gas System for the ATLAS NSW Micromegas Detectors: Design Aspects and Advanced Validation Methods for their QA/QC |
| 10:25 – 10:40 | Nikolas Patronis | UoI | Study of the $^{193}\text{Ir}(n,2n)^{192}\text{Ir}$ Reaction Cross Section |
| 10:40 – 10:55 | Panagiotis Gastis | Centr.Mich. | Nuclear reaction studies for the vp-process |
| 10:55 – 11:10 | Anastasios Lagogiannis | NCSR | Benchmarking cross sections for PIGE: The Fluorine case |
| 11:10 – 11:25 | Aggeliki Assimakopoulou | UoA | Systematic Study of proton-induced spallation reactions with the Constrained Molecular Dynamics (CoMD) Model |
| 11:25 – 12:00 | COFFEE BREAK | | |
| SESSION 2: | Chair: Xenofon Aslanoglou | UoI | |
| 12:00 – 12:15 | George Apostolopoulos | NCSR | Interactions between carbon impurities and defects produced by proton irradiation in α -iron |
| 12:15 – 12:30 | Anastasia Savidou | NCSR | Activities and prospects of the radioactive materials management laboratory at NCSR "Demokritos" |
| 12:30 – 12:45 | Theodora Vasilopoulou | NCSR | Preparation of activation experiments for ITER material characterization and data validation in the Deuterium- Tritium JET campaign |
| 12:45 – 13:00 | Nick Gazis | ESS | Engineering Design Integration & Non-Destructive Testing for the ESS accelerator |
| 13:00 – 13:15 | Eleni Adamidi | NTUA | The EDUSAFE project |
| 13:15 – 13:30 | Kornilios Routsonis | KTH/AUTH | Experimental study of the flux trap effect in a sub-critical assembly |
| 13:30 – 13:45 | Basile Spyropoulos | TEI Athens | Radiotherapy (RT) innovative Technology combined with Hospital/Home-Care Standards and Medical Protocols & Guidelines: A collective Compendium |
| 13:45 – 14:45 | LUNCH BREAK | | |

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|--|--|-------------|---|
| 14:45 - 15:30 | Convener:: I. E. Stamatelatos | NCSR | POSTER SESSION |
| SESSION 3: | Chair: Christos Tsabaris | HCMR | |
| 15:30 – 15:45 | Alexandros Clouvas | AUTH | Periodicity analysis of long period gamma radiation measurements in Thessaloniki, Northern Greece |
| 15:45 – 16:00 | John Kalef-Ezra | UoI | Limitations in the assessment of radon dose: the role of direct activity measurements |
| 16:00 – 16:15 | Alexandra Ioannidou | AUTH | Activity size distribution of radioactive nuclide ⁷ Be at different locations and under different meteorological conditions |
| 16:15 – 16:30 | Eleftheria Ioannidou | AUTH | Time lag between the tropopause height and the levels of ⁷ Be concentrations in surface air |
| 16:30 – 16:45 | Marilia Savva | NTUA | Determination of ⁷ Be, ²¹⁰ Pb and ²² Na Activity in Air and Rainwater samples by Gamma-ray Spectrometry |
| 16:45 – 17:00 | Ekaterinini Dalaka | NCSR | Temporal variations of ⁷ Be and its AMAD over “Demokritos” GAW station” |
| 17:00 - 17:30 | COFFEE BREAK | | |
| 17:30 - 19:00 | HNPS General Assembly & Elections | | |
| 20:30 | SYMPOSIUM DINNER | | |
| Saturday June 4th 2016 | | | |
| SESSION 4: | Chair: George Souliotis | UoA | |
| 09:00 – 09:15 | Roza Vlastou | NTUA | Investigation of (n,xn) reactions using the high energy neutron facility at NCSR "Demokritos" |
| 09:15 – 09:30 | Eleni Vagena | AUTH | Measurement of the average cross section for ¹⁶² Er(g, n) reaction with bremsstrahlung photons; comparison with theoretical calculations using the TALYS model |
| 09:30 – 09:45 | Veatriki Michalopoulou-Petropoulou | NCSR | A simple angle integration method for the determination of capture reaction cross sections |
| 09:45 – 10:00 | Varvara Lagaki | NCSR | Installation of Neoptolemos, the new sum spectrometer for cross section measurements of capture reactions at the Tandem Accelerator Laboratory of NCSR “Demokritos”. |
| 10:00 – 10:15 | Athanasios Stamatopoulos | NTUA-CERN | The ²⁴⁰ Pu(n,f) cross section measurement at the new experimental area at CERN's n_TOF facility |
| 10:15 – 10:30 | Antigoni Kalamara | NTUA | ¹⁹⁷ Au(n,xn) reactions at TSL high energy neutron facility at Uppsala |
| 10:30 – 10:45 | Dimitrios Papoulias | UoI | Probing electromagnetic neutrino properties from neutrino-nucleus scattering |
| 10:45 – 11:15 | COFFEE BREAK | | |

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| SESSION 5: | Chair: Maria Zamani | AUTH | |
| 11:15 – 11:30 | Marianthi Fragopoulou | AUTH | Space radiation dosimetry |
| 11:30 – 11:45 | Konstantinos Preketes-Sigalas | NCSR | Development of a simulation code for material analysis using the PIGE technique |
| 11:45 – 12:00 | Ioannis Tzifas | AUTH | Application of Synchrotrons radiation and fission track techniques to the characterization of U-bearing organic rich limestones of NW Greece. |
| 12:00 – 12:15 | Ahmed Khaliel | UoA | Experimental investigations of radiative proton-capture reactions relevant to explosive nucleosynthesis |
| 12:15 – 12:30 | Vasiliki Angelopoulou | UoA | Resurrected from the dead: Full characterization of an old HPGe detector using γ -ray and CT tomographies coupled to standard calibration techniques and simulations |
| 12:30 – 12:45 | Ioanna Sfampa | AUTH | Correlation between isothermal TL and IRSL in K-feldspars of various Types |
| 12:45 – 14:00 | LUNCH BREAK | | |
| SESSION 6: | Chair: Heleny Florou | NCSR | |
| 14:00 – 14:15 | Christos Tsabaris | HCMR | γ -ray spectrometry practices in the deep ocean |
| 14:15 – 14:30 | Froso Androulakaki | HCMR | Utilization of the Monte Carlo code FLUKA for Applications in the Marine Environment |
| 14:30 – 14:45 | Filothei Pappa | HCMR | Comparison of MCNP and ERICA codes in two different marine areas |
| 14:45 – 15:00 | Georgia Mavrokefalou | NCSR | Remote radiological assessment in the marine environment: A pilot study based on Cs-137 measurements and satellite observations in the Aegean Sea. |
| 15:00 – 15:15 | Georgios Kuburas | NCSR | A survey on the radioactivity of mineral springs in Greece |
| 15:15 - 15:30 | Konstantia Valasi | NCSR | An autonomous underwater telescope for measuring the scattering of light in the deep sea |
| 15:30 - 15:45 | Kostantinos Eleftheriadis | NCSR | Long term measurements of radioactive tracers over “Demokritos GAW station” |
| SYMPOSIUM CLOSING | | | |

POSTER SESSION

| Poster | First Author | Affiliation | Title |
|--------|-------------------------------------|-------------|--|
| P1 | Georgia Travidou | NCSR | The Use of Nuclear Methods and Techniques in Radioecology: Teaching Approaches in the Secondary Education |
| P2 | Athanasios Papageorgiou | UoA | Rare Isotope Production in peripheral heavy-ion collisions in the energy range 15-25 MeV/nucleon |
| P3 | Nick Gazis | ESS | Engineering, Design Integration and the Integration Test Standard in the Engineering Resources Group |
| P4 | Iason Mitsios | NTUA | Investigation of natural and anthropogenic radionuclides particle-size dependence in surface soils |
| P5 | Maria Sotiropoulou | NCSR | Radiological impact assessment in the terrestrial environment of Greece using innovative tools - Adaptation of ERICA Tool to actual measurements |
| P6 | John Kalef-Ezra | UoI | Design and operation of a therapeutic unit with unsealed radioactive sources |
| P7 | Heleny Florou | NCSR | The evolution of ^{137}Cs in the Greek marine environment and dose rate assessment in fish representing the three discrete exposure spaces |
| P8 | Sofia Kolovi | NCSR | Assessment of the efficiency of iron stain removal treatment in textiles by X-ray fluorescence: Preliminary results |
| P9 | Kostoula Triantou | NCSR | Positron Annihilation Lifetime Spectroscopy in the Study of Defects in Materials |
| P10 | M. Alexandropoulou | UoI | Validation of the ImageJ package for alpha track counting on Solid State Nuclear Track Detectors |
| P11 | K. Ioannides | UoCrete | Evaluation of ^{152}Dy $4\text{P}/2\text{P}$, $2\text{P}^+/2\text{P}^-$ and $2\text{D}/2\text{P}$ ratios from collisions of mixed state ($1s^2$, $1s2s$ 3S) He-like ion beams with H_2 and He targets |
| P12 | Stefania Dede | NTUA | Benchmarking the $\text{natSi}(p,p0)$ and $\text{natO}(d,d0)$ elastic scattering and the $^{16}\text{O}(d,p0,1,\alpha0)$ reactions for IBA purposes |
| P13 | Anastasios Kanellakopoulos | NTUA | Neutron-induced fission cross-section measurement of ^{234}U with monoenergetic beams in the keV and MeV range using Micromegas detectors |
| P14 | Sofia Papadimitriou | UoA | Microscopic description of neutron-induced fission with the Constrained Molecular Dynamics (CoMD) Model: Preliminary Results |
| P15 | Kalliopi Tsampa/ E-M Lykiardopoulou | UoA | Construction and Ion-Beam Characterization of Nuclear Targets |
| P16 | Dimitrios Papaioannou | UoA | Exploring the feasibility of magnetic moment measurements in the exotic ^{20}C nucleus using LISE++ calculations |
| P17 | Angelos Laoutaris | NTUA | Installation of a gas terminal stripper and a gas/foil post stripper system at the 5.5 MV Demokritos Tandem Van de Graaff accelerator |
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| P19 | Eleni Ntemou | NTUA | Measurement of differential cross sections of $\text{natLi}(d, d0)$ for EBS purposes |
| P20 | Pavlos Tsavalas | NCSR | Investigation of the ITER-like wall divertor Tiles at JET tokamak |
| P21 | Georgios Eleftheriou | NRPA | Towards the development of a radiological box model for Aegean Sea: considerations and perspectives |