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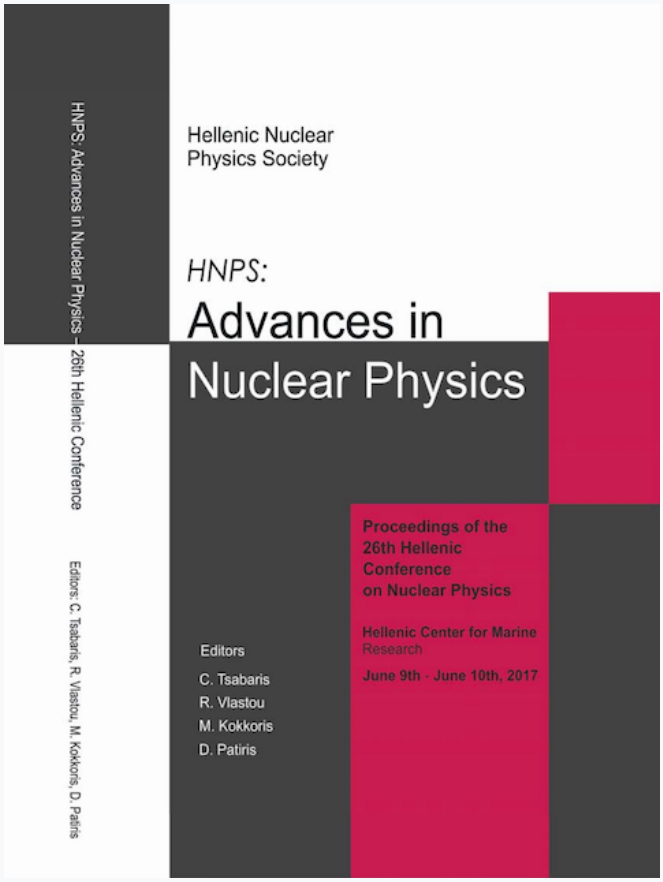

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HELLENIC NUCLEAR PHYSICS SOCIETY

PROCEEDINGS

26th HELLENIC CONFERENCE

ON

NUCLEAR PHYSICS

HELLENIC CENTER FOR MARINE RESEARCH

9 & 10 JUNE 2017

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PREFACE

This volume contains the Proceedings of the 26th Hellenic Conference on Nuclear Physics, held in facilities of the Hellenic Centre for Marine Research of Anavyssos, Attica on the 9th and 10th of June 2017. 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 involving Nuclear Physics. 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 use of local facilities along with facilities around the world. It is also a unique forum for presentations by young colleagues, in the early stages of their careers. For the first time of the conference series, a special session was dedicated to enterprises which develop, and commercialize state-of-the-art radiation equipment and products. Mirion Technologies, ITO Ltd and ANTISEL supported this special session with their participation and presentations.

The conference was organized under the auspices of the Hellenic Center for Marine Research (HCMR) and the National Technical University of Athens (NTUA). Grateful thanks are due to all the authorities of HCMR and particularly to the Institute of Oceanography for the financial support, the technical assistance and the facilities provided for the successful organization of the conference.

During the conference, Prof. Misaelides Panayiotis (Aristotle University of Thessaloniki) was honored by the board of HNPS for supporting the progress of Nuclear Science in Greece during his long academic career. Many of his colleagues praised his research achievements in the field of radiochemistry and radio-analytical chemistry as well as, his educational skills supervising and supporting the dissertations of many new scientists.

The assistance by several graduate and post graduate students is also warmly appreciated. Dr. Effrosini Androulakaki is gratefully acknowledged for the editorial assistance in the final preparation of the manuscripts and the excellent appearance of the present volume.

Anavyssos, Attica 2017

Christos Tsabaris
Rosa Vlastou
Michael Kokkoris
Dionisis Patiris

TABLE OF CONTENTS

The Greek lessons of the Chernobyl nuclear accident 1
P. Kritidis 1
Marine Radioactivity (^{137}Cs) in the Eastern Mediterranean: Sources, pathways and time evolution.....2
H. Florou 2
Response of the Greek early warning system Reuter-Stokes ionization chambers to terrestrial and cosmic radiation evaluated in comparison with spectroscopic data and time series analysis.....3
A. Clouvas.....3
Possibilities for basic and applied research in X-ray spectrometry using the IAEA multi-technique instrument operated at the XRF beamline of Elettra Sincrotrone Trieste.....4
Andreas-Germanos Karydas 4
Submarine pockmarks area localization using in-situ radio-tracing technique in Eckernförde bay, Germany.....5
D.L. Patiris 5
A New Symmetry for Heavy Nuclei: Proxy-SU(3).....6
Dennis Bonatsos.....6
Speed of sound bounds, tidal polarizability and gravitational waves from neutron stars 12
Ch.C. Moustakidis 12
Formation of fragments and hyperfragments in hadron-induced reactions.....17
T. Gaitanos 17
Parameter-Independent Predictions for Nuclear Shapes, the Prolate Dominance and the Prolate-Oblate Shape Transition in the Proxy-SU(3) Model.....21
Andriana Martinou.....21
Exploring Lepton-Flavour Violating Processes Through Neutrino Detection.....27
D.K. Papoulias 27
Lead and Uranium isotopes in Sahara Dust Aerosol observed in Athens by Alpha spectrometry.....28
K. Eleftheriadis 28
Surface sediment geochemistry of the North Aegean Sea: heavy metal hot-spots 29
A.P. Karageorgis.....29
The use of natural and anthropogenic radionuclides in calculating the recent sedimentation rates in the marine environment 30
H. Kaberi.....30
The use of radioactive tracers to measure the variability of photosynthetic and bacterial productivity in Aegean marine waters.....31
Kalliopi Pagou 31
Individual occupational radiation monitoring in Greece: where do we stand?.....32
John A. Kalef-Ezra.....32

Chronological records of metal contamination in an abandoned mine (Lavrio, Greece) using sediment profiles 38
F.K. Pappa 38
Correlation of ^{137}Cs activity concentrations with MODIS Ocean Colour Data in the Aegean Sea 45
G. Mavrokefalou 45
Natural and artificial radionuclides in moss samples from the region of Northern Greece 51
Ch.Betsou 51
Study and Detection of Relativistic and Fast Solar Neutrons at ground level with the Spherical Proportional Counter 56
D. Kyratzis 56
Thermal and fast neutron flux studies in a subcritical neutron assembly regarding to neutron absorption cross section estimation 60
G. Zisi 60
Study of Stopping Power and Energy Deposition of Atmospheric Muons in the Spherical Proportional Counter (SPC): Simulation Using GEANT4 and Experimental Data 61
G.Savvidis 61
Sensitivity of LiF:Mg+,Tl+ dosimeters as a function of radiation temperature 62
P. Konstantinidis 62
Mapping of the secondary neutron dose received in 15 MeV medical linac environments 67
P. Katsaras 67
Actinides in coastal sands from Nisyros island and Northern Greece: A comparative investigation 68
I. Tzifas 68
A study of tritium concentrations in air humidity following a rainfall 69
S. Alexandropoulou 69
Temporal variation of soil radon emanation related to seismic activity 73
S. Alexandropoulou 73
Radiological Parameters Applied in Non-human Biota Dose Assessment Tools Calculated Using ERICA Tool and Site-specific Data 77
Maria Sotiropoulou 77
A comparative study of curve-fitting algorithms used for radiation detection efficiencies 78
Eleni-Marina Lykiardopoulou 78
Building an Analog Polarity Alternator for Electromagnets used in Nuclear Structure Experiments 82
G.Zagoraios 82
Measurement and spectroscopic analysis of background radiation of UoA campus using the AMESOS mobile spectrometer 85
C. Andrikopoulos 85
A systematic study of (t,p) reactions in mid-heavy nuclei using TALYS 89
I. Sideris 89
Thin film profile measurements using RBS 93

H. Kanouta 93
Spallation Reactions of 0.1 – 1.0 GeV Protons on ^{208}Pb 94
N.G. Nicolis 94
Photodisintegration average cross sections of Dysprosium p-nuclei near (γ, n) reaction threshold 101
E. Vagena 101
Study of the ^{162}Er(n,2n)^{161}Er reaction from the reaction threshold up to 19 MeV neutron beam energy 102
E. Georgali 102
Neutron Beam Spatial Profile at n_TOF using CR-39 Nuclear Track Detectors 109
Z. Eleme 109
Development of a Novel Neutron Detector for Fusion – Preliminary results 115
M. Savva 115
Radioactivity measurements in granite samples using NaI(Tl) spectrometry 122
M. Pilakouta 122
Developments in 2D and 3D XRF analysis from the Micro to Macro scale imaging of Cultural Heritage artefacts 129
Vasiliki Kantarelou 129
Technique for Characterization and Clearance of the Resin Waste from the Greek Research Reactor (GRR-1) 130
E. Ntalla 130
Developing a Monte-Carlo Solver for the Simulation of the Reactor Core Dynamics 136
A. G. Mylonakis 136
Investigation of the JET ITER-Like Wall Be Marker Tiles 141
P. Tsavalas 141
Radiological studies of zeolites application in the environment 147
P. Kalitzis 147
Natural radioactivity levels in wheat, farm soils and phosphate fertilizers 148
N.G. Servitzoglou 148
Isospin symmetry as a master mason for paving nuclear structure experiments along the proton drip line 149
Theo J. Mertzimekis 149
Calibration of activation foils at the 14 MeV Frascati Neutron Generator 154
T. Vasilopoulou 154
Microscopic description of neutron-induced fission with the Constrained Molecular Dynamics (CoMD) Model: Recent Progress 160
S. Papadimitriou 160
Systematic studies of proton-induced spallation reactions with microscopic and phenomenological models 167
A. Asimakopoulou 167
A High Performance DAQ System for a Free Hand Small-Field γ-Camera 177
M. Zioga 177
PhoSim: A Software Simulation Package Designed for Macroscopic and Microscopic Studies in the Time-Resolved Optical Tomography 178
A.-N. Rapsomanikis 178

CSIM – A new code for the simulation of channeling EBS/RBS spectra 179
M. Kokkoris 179
Neutron-rich rare isotope production with stable and radioactive beams in the mass range A ~ 40-60 at 15 MeV/nucleon 180
A. Papageorgiou.....180
Measurements of the ^{234}U(n,f) cross-section using quasi-monoenergetic beams in the keV and MeV range and a Micromegas detector assembly.....186
A. Stamatopoulos.....186
Measurement and theoretical calculations for the cross section of the ^{197}Au(n,2n)^{196}Au reaction.....196
A. Kalamara 196
Study of the differential cross section of the ^{25}Mg(p,p'γ)^{25}Mg reaction for PIGE purposes 202
K. Preketes-Sigalas 202
Measurement of the differential cross sections of ^{6,7}Li(d,d$_0$)^{6,7}Li for Ion Beam Analysis purposes 208
E. Ntemou 208
Efficiency calibration of a medium resolution subsea detection system for extended sediment samples.....215
F. Maragkos 215
Study of deuteron elastic scattering on ^{nat}N, by implementing the EBS technique 219
P. Tsintari.....219
Neutron Radiography using isotopic neutron sources: Preliminary results 225
S. Kolovi 225
Experimental and theoretical study of the (n,2n) reaction on ^{174,176}Hf isotopes.....226
K. Krokidi 226
Activation Cross Section Measurement of the (n,2n) Reactions on ^{191}Ir 230
S.Chasapoglou 230
Detailed efficiency simulations of the GEROS spectrometer using MCNP5 234
V. Lagaki.....234
Resistivity Recovery Stages of Proton Irradiated EUROFER97 Steel 235
A.Theodorou 235
Measurements of the ^{234}U(n,f) and ^{236}U(n,f) cross-sections between 15 and 20 MeV with MicroMegas detectors 239
V. Michalopoulou 239
Comparison of two sample preparation techniques for XRF analysis of fly ash samples 244
P. K. Rouni.....244
Determining the positron lifetime of a material using Positron Annihilation Lifetime Spectroscopy.....245
Kostoula Triantou 245
Activation analysis of a metallurgical tap smelting slag sample using a high energy medical accelerator: Further studies 249
N. Togia 249

Potentialities and perspectives of proton induced quasi-monochromatic X-rays in fundamental studies and analytical applications 253
A. G. Karydas 253
Nuclear analytical techniques for the chemical characterization of aerosol samples ...254
M. Manousakas 254
Release of the Radiochemical Lab at the Tandem Accelerator Building 255
I. Karachristou.....255
Radon Monitoring as Part of Multidisciplinary Study of Pre-Earthquake Anomalies in the Western Hellenic Trench 260
G. Eleftheriou.....260
Conference Program…….……...261

26th Annual Symposium of HNPS - Symposium Program

Friday 9 June 2017

08:30 - 09:30	Registration		
09:30 - 10:00	Welcome Speeches		

Session I: "Environmental Radiation", Chair: Harissopulos S.

10:00 - 10:30	Kritidis	NCSR Demokritos	The Greek lessons from the Chernobyl nuclear accident
10:30 - 10:45	Florou H.	NCSR Demokritos	Marine Radioactivity in the Eastern Mediterranean: Sources, pathways and the time evolution
10:45 - 11:00	Clouvas A.	AUTH	Response of the Greek early warning system Reuter-Stokes ionization chambers to terrestrial and cosmic radiation evaluated in comparison with spectroscopic data and time series analysis
11:00 - 11:15	Karydas A.G.	IAEA, NCSR Demokritos	Possibilities for basic and applied research in X-ray spectrometry using the IAEA multi-technique instrument operated at the XRF beamline of Elettra Sincrotrone Trieste
11:15 - 11:30	Patiris D.L.	HCMR	Submarine pockmarks area localization using in-situ radiotracing technique in Eckernförde bay, Germany
11:30 - 12:00	Coffee Break		

Session II: "Theoretical Nuclear Physics", Chair: Mavrommatis E.

12:00 - 12:15	Bonatsos D.	NCSR Demokritos	A New Symmetry for Heavy Nuclei: Proxy-SU(3)
12:15 - 12:30	Moustakidis Ch.	AUTH	Bounds on the speed of sound in dense matter, tidal polarizability and gravitational waves from neutron stars
12:30 - 12:45	Gaitanos T.	AUTH	Formation of fragments and hyperfragments in hadron-induced reactions
12:45 - 13:00	Martinou A.	NCSR Demokritos	Parameter-Independent Predictions for Nuclear Shapes, the Prolate Dominance and the Prolate-Oblate Shape Transition in the Proxy-SU(3) Model
13:00 - 13:15	Papoulias D.	UOI	Exploring Lepton-Flavour Violating Processes Through Neutrino Detection
13:15 - 15:00	Lunch Break		

Session III: "Experimental Methods for Environmental Processes and Protection", Chair: Misaelides P.

15:00 - 15:15	Eleftheriadis K.	NCSR Demokritos	Lead and Uranium isotopes in Sahara Dust Aerosol observed in Athens by Alpha spectrometry
15:15 - 15:30	Karageorgis A.	HCMR	Surface sediment geochemistry of the North Aegean Sea: heavy metal hot spots
15:30 - 15:45	Kaberi H.	HCMR	Recent sedimentation rates in the Hellenic marine areas using ^{210}Pb and ^{137}Cs dating methods
15:45 - 16:00	Pagou K.	HCMR	The use of radioactive tracers to measure the variability of photosynthetic and bacterial productivity in Aegean marine water
16:00 - 16:15	Kalef-Ezra J.	UOI	Individual occupational radiation monitoring in Greece: where do we stand?

16:15 - 16:30	Pappa F.	HCMR,NTUA	Chronological records of metal contamination in an abandoned mine (Lavrio, Greece) using sediment profiles
16:30 - 16:45	Mavrokefalou G.	NCSR Demokritos	Correlation of ^{137}Cs activity concentrations with MODIS Ocean Colour Data in the Aegean Sea
16:45 - 17:15	Short Break		
Session IV:	"Technological Advances in Radiation Detection", Chair: Tsabaris C.		
17:15 - 17:30	Boulemar C. & Tischenbach E.	Mirion	Introduction to the Mirion Technologies group
17:30 - 17:45	Boulemar C. & Tischenbach E.	Mirion	Gamma detectors technologies overview & how to choose your HPGe detectors
17:45 - 18:00	Boulemar C. & Tischenbach E.	Mirion	ISOCS/LabSOCS technologies, cascade summing correction & In Situ measurements
18:00 - 18:15	Boulemar C. & Tischenbach E.	Mirion	Transition from NIM to modern MCA & applications (Spectroscopy, Compton suppression, Veto Cosmic, Low background spectroscopy)
18:15 - 20:15	HNPS Annual General Assembly		
21:00	Symposium Dinner		
10:00 - 18:00	Poster session I		
P1	Betsou Ch.	AUTH	Natural and artificial radionuclides in moss samples from the region of Northern Greece
P2	Kyratzis D.	AUTH	Study and Detection of Solar Neutrons at ground level with the Spherical Proportional Counter
P3	Zisi G.	AUTH	Thermal and fast neutron flux studies in a subcritical neutron assembly regarding to neutron absorption cross section estimation
P4	Savvidis G.	AUTH	Study of Stopping Power and Energy Deposition of Atmospheric Muons in the Spherical Proportional Counter (SPC): Simulation Using GEANT4 and Experimental Data
P5	Konstantinidis P.	AUTH	Beta ray sensitivity of LiF dosimeters as a function of radiation temperature
P6	Katsaras P.	AUTH	Mapping of the secondary neutron dose received in 15 MeV medical linac environments
P7	Tzifas I.	AUTH	Actinides in coastal sands from Nisyros island and Northern Greece: A comparative investigation
P8	Alexandropoulou S.	UOI	A study of tritium concentrations in air humidity following a rainfall
P9	Alexandropoulou S.	UOI	Temporal and spatial variation of soil radon emanation
P10	Sotiropoulou M.	NCSR Demokritos/AUTH	Radiological Parameters Applied in Non-human Biota Dose Assessment Tools Calculated Using ERICA Tool and Site-specific Data
P11	Lykiardopoulou E.M	UOA	A comparative study of curve-fitting algorithms used for radiation detector efficiencies
P12	Zagoraios G.	UOA	Building an Analog Polarity Altenator for Electromagnets used in Nuclear Structure Experiments
P13	Andrikopoulos C.	UOA	Measurement and spectroscopic analysis of background radiation of UoA campus using NaI detector
P14	Sideris I.	UOA	A systematic study of (t,p) reactions in mid-heavy nuclei using TALYS
P15	Kanouta H.	UOI	Thin film profile measurements using RBS

26th Annual Symposium of HNPS - Symposium Program

Saturday 10 June 2017

Session I: "Experimental Nuclear Physics I", Chair: Aslanoglou X.

10:00 - 10:15	Nicolis N.	UOI	Spallation Reactions of 0.1 – 1.0 GeV protons on ^{208}Pb
10:15 - 10:30	Vagena E./Stoulos S	AUTH	Photodisintegration average cross sections of Dysprosium p-nuclei near (γ, n) reaction threshold
10:30 - 10:45	Georgali E.	UOI	Study of the ^{162}Er(n,2n)^{161}Er reaction from the reaction threshold up to 19 MeV neutron beam energy
10:45 - 11:00	Eleme Z.	UOI	Neutron Beam Spatial Profile at n_TOF using CR-39 Nuclear Track Detectors
11:00 - 11:15	Savva M.	NCSR Demokritos	Novel Neutron Activation Detector for Fusion
11:15 - 11:45	Coffee break		

Session II: "Applications in Energy, Environment and Cultural Heritage", Chair: Stamatelatos I.

11:45 - 12:00	Pilakouta M.	PUAS	Radioactivity measurements in granite samples using NaI(Tl) spectrometry
12:00 - 12:15	Kantarelou V.	NCSR Demokritos	Developments in 2D and 3D XRF analysis from the Micro to Macro scale imaging of Cultural Heritage artefacts
12:15 - 12:30	Ntalla E.	NCSR Demokritos	Technique for Characterization and Clearance of the Resin Waste from the Greek Research Reactor (GRR-1)
12:30 -12:45	Mylonakis A.	NCSR Demokritos	Developing a Monte-Carlo Solver for the Simulation of the Reactor Core Dynamics
12:45 - 13:00	Tsavalas P.	NCSR Demokritos	Investigation of the JET ITER-Like Wall Be Marker Tiles
13:00 - 13:15	Kalitzis P. 13:15	AUTH	Radiological studies of zeolites application in the environment
- 13:30	Servitzoglou N. 13:30	AUTH	Natural radioactivity levels in wheat, farm soils and phosphate fertilizers
- 14:30	Lunch break		

Session III: "Experimental Nuclear Physics II", Chair: Styliaris S.

14:30 - 14:45	Mertzimekis T.	UOA	Isospin symmetry as a master mason for paving nuclear structure experiments along the proton drip line
14:45 - 15:00	Vasilopoulou T.	NCSR Demokritos	Calibration of activation foils detector assembly at the 14 MeV Frascati Neutron Generator
15:00 - 15:15	Papadimitriou S.	UOA	Microscopic description of neutron-induced fission with the Constrained Molecular Dynamics (CoMD) Model: recent progress
15:15 - 15:30	Asimakopoulou A.	UOA	Systematic studies of proton-induced spallation reactions with microscopic and phenomenological models
15:30 - 15:45	Zioga M.	UOA	A High Performance DAQ System for a Free Hand Small-Field γ-Camera
15:45 - 16:00	Rapsomanikis A.	UOA	PhoSim: A Software Simulation Package Designed for Macroscopic and Microscopic Studies in the Time-Resolved Optical Tomography

16:00 - 16:30	Short Break		

Session IV: "Experimental Nuclear Physics III", Chair: Souliotis G.A

16:30 - 16:45	Kokkoris M.	NTUA	CSIM – A new code for the simulation of channeling EBS/RBS spectra
16:45 - 17:00	Papageorgiou A.	UOA	Neutron-rich rare isotope production with stable and radioactive beams in the mass range A ~ 40-60 at 15 MeV/nucleon
17:00 - 17:15	Stamatopoulos A.	NTUA	Measurement of the ^{234}U neutron-induced fission cross section using quasi-monoenergetic beams in the keV and MeV range and a Micromegas detector assembly
17:15 - 17:30	Kalamara A.	NTUA	Cross section measurements of the ^{197}Au(n,2n)^{196}Au reaction
17:30 - 17:45	Preketes-Sigalas K.	NTUA, NCSR Demokritos	PIGE related differential cross-section measurements of the ^{25}Mg(p,p'γ)^{25}Mg reaction
17:45 - 18:00	Ntemou E.	NTUA, NCSR Demokritos	Measurement of the differential cross sections of ^{6,7}Li(d,d$_0$) for Ion Beam Analysis purposes
18:00 -18:30	Closing		

10:00 - 18:00 Poster Session II

P1	Maragkos F.	HCMR/NTUA	Efficiency calibration of a medium resolution subsea detection system for sediment extended samples
P2	Tsintari P.	NTUA	Differential cross-section measurements for deuteron elastic scattering on ^{nat}N for EBS purposes
P3	Kolovi S.	NCSR Demokritos/UOA	Neutron Radiography using isotopic neutron sources: Preliminary results
P4	Krokidi K.	NTUA	Experimental and theoretical study of the (n,2n) reactions on ^{174,175}Hf isotopes
P5	Chasapoglou S.	NTUA	Activation Cross Section Measurement of the (n,2n) Reactions on Natural Ir Isotopes
P6	Lagaki V.	UOA	Detailed efficiency simulations of the GEROS spectrometer using MCNP5
P7	Theodorou A.	UOA/NCSR Demokritos	Resistivity Recovery Stages of Proton Irradiated EUROFER97 Steel
P8	Michalopoulou V.	NTUA	Measurement of the ^{234}U(n,f) and ^{236}U(n,f) cross-sections in the MeV region with MicroMegas detectors
P9	Rouni P.	NTUA	Comparison of two sample preparation techniques for XRF analysis of fly ash samples
P10	Triantou K.	NCSR Demokritos	Determining the positron lifetime of a material using Positron Annihilation Lifetime Spectroscopy
P11	Togia N.	NCSR Demokritos, UOA	Photon activation analysis of metallurgical tap smelting slag using a high energy medical accelerator: Further studies
P12	Karydas A.G.	NCSR Demokritos	Potentialities and perspectives of proton induced quasi-monochromatic X-rays in fundamental studies and analytical applications
P13	Manousakas M.	NCSR Demokritos	Nuclear analytical techniques for the chemical characterization of aerosol samples
P14	Karachristou I.	NCSR Demokritos	Release of the Radiochemical Lab at the Tandem Accelerator Building
P15	Eleftheriou G.	NOA	Radon Monitoring as Part of Multidisciplinary Study of Pre-Earthquake Anomalies in the Western Hellenic Trench