



Eleventh International Topical Meeting on Nuclear Applications of Accelerators

5 - 8 August 2013, Bruges, Belgium



General Chair: Hamid Ait Abderrahim
Co-Chairs: Philip Cole & Sotirios Charisopoulos

Program Chair: Dirk Vandeplassche
Co-Chair: Stuart Henderson

Finance Chair: Christian Legrain

UPDATED FINAL PROGRAM

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PRESENTATION CODES

Each code consists of four parts: MO/O/AD/01

Part 1 is the day of presentation:

MO = Monday
TU = Tuesday
WE = Wednesday
TH = Thursday

Part 2 is the presentation type:

O = Oral presentation
P = Poster presentation
XYZ = Plenary presentation

Part 3 is the topic:

AD = Accelerators for ADS and ADS Experiments (colour code: grey)
AT = Accelerator Design and Technology (colour code: blue)
FA = Accelerator Facilities (colour code: yellow)
LI = Accelerators in the Life Sciences (colour code: green)
MA = Material Research with Accelerators (colour code: pink)
ND = Nuclear Data (colour code: orange)
SI = Accelerators for Safety and Security/Industrial Applications (colour code: turquoise)
TA = High Power Proton Accelerators and Spallation Targets (colour code: purple)

Part 4 is the sequence of the presentation on a particular day

PROGRAM AT A GLANCE

Monday, August 5

08:45 - 09:00	Welcome Address	
09:00 - 09:30	High Power Proton Accelerators and Spallation Targets 1 (Ambassador Room)	
09:35 - 10:35	Accelerator Facilities 1 (Ambassador Room)	High Power Proton Accelerators and Spallation Targets 1 (Beethoven Room)
10:35 - 11:00	Coffee Break in the Exhibition and Poster Area (Level 2)	
11:00 - 11:30	Accelerators in the Life Sciences 1 (Ambassador Room)	
11:30 - 12:00	Material Research with Accelerators 1 (Ambassador Room)	
12:05 - 12:45	Accelerators in the Life Sciences 1 (Ambassador Room)	Material Research with Accelerators 1 (Beethoven Room)
12:45 - 14:15	Lunch Break in the Exhibition and Poster Area (Level 2)	
14:15 - 15:15	Accelerator Facilities 1 (Ambassador Room)	Accelerators in the Life Sciences 1 (Beethoven Room)
15:15 - 15:55	High Power Proton Accelerators and Spallation Targets 1 (Ambassador Room)	Material Research with Accelerators 1 (Beethoven Room)
15:55 - 16:30	Coffee Break in the Exhibition and Poster Area (Level 2)	
16:30 - 17:45	POSTERS Accelerator Facilities (Grote Witte Roos)	
	POSTERS High Power Proton Accelerators and Spallation Targets (Grote Witte Roos)	
19:00 - 20:00	Welcome Reception at the Town Hall offered by the Mayor of Brugge	

Tuesday, August 6

08:00 - 08:30	IAEA Activities on Accelerator Technologies (Ambassador Room)	
08:30 - 09:00	Accelerators in the Life Sciences 2 (Ambassador Room)	
09:00 - 09:30	Accelerator Facilities 2 (Ambassador Room)	
09:35 - 10:35	Accelerators in the Life Sciences 2 (Ambassador Room)	Accelerator Facilities 2 (Beethoven Room)
10:35 - 11:00	Coffee Break in the Exhibition and Poster Area (Level 2)	
11:00 - 11:30	Nuclear Data 1 (Ambassador Room)	
11:30 - 12:00	Accelerator Design and Technology 1 (Ambassador Room)	
12:05 - 12:45	Nuclear Data 1 (Ambassador Room)	Accelerator Design and Technology 1 (Beethoven Room)
12:45 - 14:15	Lunch Break in the Exhibition and Poster Area (Level 2)	
14:15 - 15:15	Accelerators in the Life Sciences 2 (Ambassador Room)	Accelerator Design and Technology 1 (Beethoven Room)
15:15 - 16:15	Accelerator Facilities 2 (Ambassador Room)	Nuclear Data 1 (Beethoven Room)
16:15 - 16:45	Coffee Break in the Exhibition and Poster Area (Level 2)	
16:45 - 18:00	POSTERS Accelerators in the Life Sciences (Grote Witte Roos)	
	POSTERS Accelerator Design and Technology (Grote Witte Roos)	
19:30 - 23:00	Accapp '13 Banquet	

PROGRAM AT A GLANCE

Wednesday, August 7

08:30 - 09:00	High Power Proton Accelerators and Spallation Targets 2 (Ambassador Room)	
09:00 - 09:30	Accelerators for Safety and Security/Industrial Applications (Ambassador Room)	
09:35 - 10:35	High Power Proton Accelerators and Spallation Targets 2 (Ambassador Room)	Accelerators for Safety and Security/Industrial Applications (Beethoven Room)
10:35 - 11:00	Coffee Break in the Exhibition and Poster Area (Level 2)	
11:00 - 11:30	Accelerators for ADS and ADS Experiments 1 (Ambassador Room)	
11:35 - 12:55	Accelerators for ADS and ADS Experiments 1 (Ambassador Room)	High Power Proton Accelerators and Spallation Targets 2 (Beethoven Room)
12:55 - 14:30	Lunch Break in the Exhibition and Poster Area (Level 2)	
14:30 - 15:30	Accelerators for ADS and ADS Experiments 1 (Ambassador Room)	Nuclear Data 2 (Beethoven Room)
15:30 - 16:10		Accelerators in the Life Sciences 3 (Beethoven Room)
16:10 - 16:45	Coffee Break in the Exhibition and Poster Area (Level 2)	
16:45 - 18:00	POSTERS Accelerators for ADS and ADS experiments (Grote Witte Roos)	
	POSTERS Nuclear Data (Grote Witte Roos)	
	POSTERS Material Research with Accelerators (Grote Witte Roos)	

Thursday, August 8

08:30 - 09:00	Accelerators in the Life Sciences 3 (Ambassador Room)	
09:00 - 09:30	High Power Proton Accelerators and Spallation Targets 3 (Ambassador Room)	
09:35 - 10:35	Accelerators in the Life Sciences 3 (Ambassador Room)	High Power Proton Accelerators and Spallation Targets 3 (Beethoven Room)
10:35 - 11:00	Coffee Break in the Exhibition and Poster Area (Level 2)	
11:00 - 11:30	Accelerators for ADS and ADS Experiments 2 (Ambassador Room)	
11:35 - 12:35	Accelerators in the Life Sciences 3 (Ambassador Room)	Accelerators for ADS and ADS Experiments 2 (Beethoven Room)
12:35 - 14:05	Lunch Break in the Exhibition and Poster Area (Level 2)	
14:05 - 15:05	Accelerator Design and Technology 2 (Ambassador Room)	High Power Proton Accelerators and Spallation Targets 3 (Beethoven Room)
15:10 - 15:40	Accelerator Design and Technology 2 (Ambassador Room)	
15:40 - 16:00	Concluding Remarks	

08:45 - 09:00	Welcome Address Hamid AIT ABDERRAHIM, General Chair	
	Plenary Talk - Ambassador Room (Level 0)	
09:00 - 09:30	High Power Proton Accelerators and Spallation Targets 1 MOXTA02 SPIRAL2, status of an ambitious project for nuclear research Robin FERDINAND, GANIL/SPIRAL2, France	
	Ambassador Room (Level 0) Chair: Jean-Michel LAGNIEL	Beethoven Room (Level 1) Chair: François PLEWINSKI
	Accelerator Facilities 1	High Power Proton Accelerators and Spallation Targets 1
09:35 - 09:55	MOOFA03 ISOL@MYRRHA an application of the MYRRHA accelerator for nuclear physics Lucia POPESCU, SCK-CEN, Belgium	MOOTA03 Commissioning of a liquid-lithium target with the SARAF high-intensity proton beam Ido SILVERMAN, Soreq NRC, Israel
09:55 - 10:15	MOOFA04 Recent progress of heavy-ion cancer radiotherapy with NIRS-HIMAC Koji NODA, National Institute of Radiological Sciences, Japan	MOOTA04 High power target R&D program at Fermilab Patrick HURH, Fermilab, USA
10:15 - 10:35	MOOFA05 LANSCE as a high-power beam applications test bed Robert W. GARNETT, Los Alamos National Laboratory, USA	MOOTA05 High power beam dump and target / accelerator interface procedures John GALAMBOS, Oak Ridge National Laboratory, Oak Ridge TN, USA
10:35 - 11:00	Coffee Break offered by the Belgian Nuclear Forum in the Exhibition and Poster Area (Level 2)	
	Plenary Talks - Ambassador Room (Level 0)	
11:00 - 11:30	Accelerators in the Life Sciences 1 MOXLI06 Accelerator-based boron neutron capture therapy Andres KREINER, CNEA, Argentina	
11:30 - 12:00	Material Research with Accelerators 1 MOXMA07 IAEA Coordinated Research Projects on modelling and accelerator simulation of nuclear fuel and structural materials behaviour under irradiation Victor INOZEMTZEV, IAEA, Austria	
	Ambassador Room (Level 0) Chair: George COUTRAKON	Beethoven Room (Level 1) Chair: Alexander RYAZANOV
	Accelerators in the Life Sciences 1	Material Research with Accelerators 1
12:05 - 12:25	MOOLI08 Development of the accelerator based production of MO-99 at the low energy accelerator facility, Argonne national laboratory Sergey CHEREMISOV, Argonne National Laboratory, USA	MOOMA08 Ion issues on irradiation behavior of structural materials at high doses and gas concentrations Victor VOYEVODIN, Kharkov Institute of Physics and Technology, Ukraine
12:25 - 12:45	MOOLI09 Design and thermal-hydraulic performance of a helium cooled target for the production of medical isotope ^{99m}Tc Keith WOLOSHUN, Los Alamos National Laboratory, USA	MOOMA09 Use of fast ion irradiation on accelerators and neutron irradiation in atomic reactors for investigations of radiation resistance of structural sic composite materials for advanced fission and fusion reactors Alexander RYAZANOV / National Research Centre "Kurchatov Institute", Russia

12:45 - 14:15	Lunch Break in the Exhibition and Poster Area (Level 2)	
	Ambassador Room (Level 0) Chair: Jean-Michel LAGNIEL	Beethoven Room (Level 1) Chair: George COUTRAKON
	Accelerator Facilities 1	Accelerators in the Life Sciences 1
14:15 - 14:35	MOOFA10 The status of KOMAC accelerator facility Yong-Sub CHO, KOMAC/KAERI, Korea	MOOLI10 Medical isotope production using accelerator neutrons Yasuki NAGAI, Japan Atomic Energy Agency
14:35 - 14:55	MOOFA11 The ESS-BILBAO Project Angelo GHIGLINO for the ESS-BILBAO team, Spain	MOOLI11 Harvesting medical radioisotopes from FRIB Graham PEASLEE, Hope College, USA
14:55 - 15:15	MOOFA12 The Bariloche LINAC - Present activities Roberto MAYER, Centro Atómico Bariloche, Argentina	MOOLI12 ⁶⁸Ge-⁶⁸Ga production: Excitation functions, target preparation and PC-controlled radiochemistry system Razvan ADAM REBELES, Vrije Universiteit Brussel, Belgium
	Ambassador Room (Level 0) Chair: François PLEWINSKI	Beethoven Room (Level 1) Chair: Alexander RYAZANOV
	High Power Proton Accelerators and Spallation Targets 1	Material Research with Accelerators 1
15:15 - 15:35	MOOTA13 SINQ operational experience with solid high-power targets and heavy water cooling systems Michael WOHLMUTHER, Paul Scherrer Institut, Switzerland	MOOMA13 Atomic structure of ion tracks and microstructure evolution in oxide ceramics irradiated with swift heavy ions Kazuhiro YASUDA, Kyushu University, Japan
15:35 - 15:55	MOOTA14 Overview of the MEGAPIE project – from the design to first PIE results Michael WOHLMUTHER, Paul Scherrer Institut, Switzerland	MOOMA14 Modeling of local changes in composition of alloys along the projected range under heavy ion irradiation Valerii PECHENKIN, State Scientific Center of Russian Federation, Russia
15:55 - 16:30	Coffee Break in the Exhibition and Poster Area (Level 2)	
16:30 - 17:45	POSTERS Accelerator Facilities / MOPFA (Level 2, see Poster List page 14)	
	POSTERS High Power Proton Accelerators and Spallation Targets / MOPTA (Level 2, see Poster List page 14)	
19:00	Welcome Reception at the Town Hall offered by the Mayor of Brugge	

Plenary Talks - Ambassador Room (Level 0)	
08:00 - 08:30	TUXX IAEA Activities on Accelerator Technologies Sotirios CHARISOPOULOS
08:30 - 09:00	Accelerators in the Life Sciences 2 TUYLI01 Advanced technologies for proton and ion therapy Carol JOHNSTONE, Fermi National Accelerator Laboratory, USA
09:00 - 09:30	Accelerator Facilities 2 TUYFA02 New large-scale accelerator projects in China Jingyu TANG, Institute of High Energy Physics, China

	Ambassador Room (Level 0) Chair: Roger BARLOW	Beethoven Room (Level 1) Chair: Haihong XIA
	Accelerators in the Life Sciences 2	Accelerator Facilities 2
09:35 - 09:55	TUOLI03 Production of medical radioisotopes with linear accelerators Doug WELLS, Idaho State University, USA	TUOFA03 The National Center for Oncological Hadrontherapy in Italy (CNAO): Design and status Marco PULLIA, Fondazione CNAO, Italy
09:55 - 10:15	TUOLI04 Virginia Nuclear Medical Isotope Development Facility Ganapati MYNENI, Jefferson Laboratory, USA	TUOFA04 Recent progress of pulsed spallation neutron source in J-PARC Hiroshi TAKADA, Japan Atomic Energy Agency, Japan
10:15 - 10:35	TUOLI05 Life science applications of lead-bismuth spallation target planned in J-PARC project Hayanori TAKEI, Japan Atomic Energy Agency, Japan	TUOFA05 Basic and applied science using the monoenergetic pulsed neutron beams from the University of Kentucky Accelerator Laboratory Jeffrey VANHOY, U.S. Naval Academy, USA

10:35 - 11:00 **Coffee Break offered by the Belgian Nuclear Forum in the Exhibition and Poster Area (Level 2)**

Plenary Talks - Ambassador Room (Level 0)	
11:00 - 11:30	Nuclear Data 1 TUXND06 Extended capabilities of the Liège intra nuclear cascade model: A versatile and predictive generator for a wide range of accelerator applications Alain BOUDARD, CEA, France
11:30 - 12:00	Accelerator Design and Technology 1 TUXAT07 Modeling high-power accelerators reliability - Reliability model of SNS LINAC (SNS-ORNL); Reliability modelling for MAX LINAC (MYRRHA project) Pedro FERNANDEZ RAMOS, Empresarios Agrupados (EA), Spain

	Ambassador Room (Level 0) Chair: Yury TITARENKO	Beethoven Room (Level 1) Chair: Peter OSTROUMOV
	Nuclear Data 1	Accelerator Design and Technology 1
12:05 - 12:25	TUOND08 Importance of nuclear data for neutron resonance densitometry Bjorn BECKER, EC-JRC-IRMM, Belgium	TUOAT08 Simulating convoluted moderators Esben KLINKBY, Technical University of Denmark

12:25 - 12:45	TUOND09 A new ROOT-based nuclear data library for ENDF Tae-Sun PARK, SungKyunKwan University, Korea	TUOAT09 High density electron beam for Gamma-Ray Compton Sources Cristina VACCAREZZA, INFN-LNF, Italy
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12:45 - 14:15 **Lunch Break in the Exhibition and Poster Area (Level 2)**

	Ambassador Room (Level 0) Chair: Roger BARLOW	Beethoven Room (Level 1) Chair: Peter OSTROUMOV
	Accelerators in the Life Sciences 2	Accelerator Design and Technology 1
14:15 - 14:35	TUOLI10 Development of an in vitro irradiation setup for broad beam radiobiological experiment Stéphane LUCAS, University of Namur, Belgium	TUOAT10 An experience-based design approach for high-power linacs Robert GARNETT, Los Alamos National Lab., USA
14:35 - 14:55	TUOLI11 IBARAKI Biological Crystal Diffractometer (iBIX) and towards the further structural biology Ichiro TANAKA, Ibaraki University, Japan	TUOAT11 The DORIAN code for the prediction and analysis of residual dose rates due to accelerator radiation induced activation Robert FROESCHL, CERN, Switzerland
14:55 - 15:15	TUOLI12 Current status of Si crystal analyzer near backscattering spectrometer DNA in J-PARC and its application to life science Takehsi YAMADA, CROSS, Japan	TUOAT12 High-power magnetron RF source for superconducting linacs of ads and intensity frontier projects Rolland JOHNSON, Muons, USA

	Ambassador Room (Level 0) Chair: Haihong XIA	Beethoven Room (Level 1) Chair: Yury TITARENKO
	Accelerator Facilities 2	Nuclear Data 1

15:15 - 15:35	TUOFA13 JEMMRLA, a proof of concept for optimal recirculating Linac acceleration for muon colliders and neutrino factories Yves ROBLIN, Thomas Jefferson National Accelerator Facility, USA	TUOND13 The EU ANDES and CHANDA projects Arjan PLOMPEN, EC-JRC-IRMM, Belgium
15:35 - 15:55	TUOFA14 Applied research using particles accelerators at the University of Liège David STRIVAY, University of Liège, Belgium	TUOND14 Neutron studies for advanced reactors at n_TOF (CERN) Giuseppe TAGLIENTE, Istituto Nazionale di Fisica Nucleare, Italy
15:55 - 16:15	TUOFA15 Linac-based photo-nuclear applications at the Idaho accelerator center Daniel DALE, Idaho State University, USA	TUOND15 FALSTAFF: A new setup for fission fragment and neutron multiplicity characterization Francois LECOLLEY, LPC, France

16:15 - 16:45 **Coffee Break in the Exhibition and Poster Area (Level 2)**

16:45 - 18:00	POSTERS Accelerators in the Life Sciences / TUPLI (Level 2, see Poster List page 16)
	POSTERS Accelerator Design and Technology / TUPAT (Level 2, see Poster List page 17)

19:30 - 23:00 **Accapp '13 Banquet at the 'Concertgebouw' (see page 91)**

Plenary Talks - Ambassador Room (Level 0)	
08:30 - 09:00	High Power Proton Accelerators and Spallation Targets 2 WEYTA01 ESS target station basic design choices: Safety and performance Ferenc MEZEI, European Spallation Source ESS AB, Sweden
09:00 - 09:30	Accelerators for Safety and Security/Industrial Applications WEXSI02 Detection of illicit materials in cargo containers by using neutron beams: A status report Giuseppe VIESTI, University of Padova, Italy

Ambassador Room (Level 0) Chair: Michael WOHLMUTHER		Beethoven Room (Level 1) Chair: Jean-Louis BOL	
High Power Proton Accelerators and Spallation Targets 2		Accelerators for Safety and Security/Industrial Applications	
09:35 - 09:55	WEOTA03 ESS target station – An overview of the monolith layout and design Rikard LINANDER, European Spallation Source ESS AB, Sweden	WEOSI03 Low energy fusion reactions as a neutron source for security applications Simon ALBRIGHT, University of Huddersfield, UK	
09:55 - 10:15	WEOTA04 Beam raster option for producing the beam spot on the ESS target Alan TAKIBAYEV, European Spallation Source ESS AB, Sweden	WEOSI04 Proof-of-principle results for identifying the composition of dust particles and volcanic ash samples through the technique of photon activation analysis at the Idaho accelerator center Philip COLE, Idaho State University, USA	
10:15 - 10:35	WEOTA05 A water-cooled cannelloni target for the ESS 5 MW source Angelo GHIGLINO, Consorcio ESS-BILBAO, Spain	WEOSI05 Latest results of the world first high power X-ray processing facility Jean-Louis BOL, Ion Beam Applications (IBA), Belgium	

10:35 - 11:00 **Coffee Break in the Exhibition and Poster Area (Level 2)**

Plenary Talk - Ambassador Room (Level 0)	
11:00 - 11:30	Accelerators for ADS and ADS Experiments 1 WEXAD06 MYRRHA a flexible and fast spectrum irradiation facility Hamid AIT ABDERRAHIM, SCK-CEN, Belgium

Ambassador Room (Level 0) Chair: Andrew HUTTON		Beethoven Room (Level 1) Chair: Michael WOHLMUTHER	
Accelerators for ADS and ADS Experiments 1		High Power Proton Accelerators and Spallation Targets 2	
11:35 - 11:55	WEOAD07 Operation of the GENEPI-3C accelerator for the ADS mock-up GUINEVERE Emmanuel FROIDEFOND, LPSC, France	WEOTA07 An overview of the in-monolith monitoring and instrumentation at ESS Stephen GALLIMORE, European Spallation Source ESS AB, Sweden	
11:55 - 12:15	WEOAD08 Experimental results on the deuteron-beam-induced high-energy neutron fission of the uranium isotopes at the massive uranium QUINTA target Lukas ZAVORKA, Joint Institute for Nuclear Research, Russia	WEOTA08 The ROTating Tungsten HELium cooled TARGET (ROTHETA) concept Cyril KHAROUA, European Spallation Source ESS AB, Sweden	

12:15 - 12:35	WEOAD09 Accelerator-driven subcritical fission in a molten salt core Peter McINTYRE, Texas A&M University, USA	WEOTA09 Advanced bi-spectral moderators for European spallation source Alan TAKIBAYEV, European Spallation Source ESS AB, Sweden
12:35 - 12:55	WEOAD10 Keys to transitioning ADSR from an stalled R&D program into a reality today R. Bruce VOGELAAR, Virginia Tech, USA	WEOTA10 Cold moderators for long pulse neutron sources Konstantin BATKOV, European Spallation Source ESS AB, Sweden

12:55 - 14:30 **Lunch Break in the Exhibition and Poster Area (Level 2)**

Ambassador Room (Level 0) Chair: Andrew HUTTON		Beethoven Room (Level 1) Chair: Joseph CUGNON	
Accelerators for ADS and ADS Experiments 1		Nuclear Data 2	
14:30 - 14:50	WEOAD11 The potential for a high power FFAG proton driver for ADS Suzie SHEEHY, Rutherford Appleton Laboratory, UK	WEOND11 Examples of calculations of spallation target residue production with INCL4.6-Abla07 implemented into MCNPX Alain BOUDARD, CEA, France	
14:50 - 15:10	WEOAD12 ADS Research activities in Sungkyunkwan university Seung-Woo HONG, SungKyunKwan University, Korea	WEOND12 Proton stopping power measurements in warm dense matter Drew HIGGINSON, École Polytechnique, France	
15:10 - 15:30	WEOAD13 Neutronic analysis and transmutation performance of Th-based molten salt fuels Sang-In BAK, SungKyunKwan University, Korea	WEOND13 He-EFIT ADS core: E study of nuclear data uncertainties Alan TAKIBAYEV, CEA, France	

Beethoven Room (Level 1)
Chair: Carol JOHNSTONE

Accelerators in the Life Sciences 3

15:30 - 15:50	WEOAD14 Reactivity monitoring techniques for KIPT neutron source facility Yan CAO, Argonne National Laboratory, USA	WEOLI14 ProteusONE: A new, single room compact proton therapy system from IBA Thomas SERVAIS, Ion Beam Applications, Belgium
15:50 - 16:10	WEOAD15 Accelerator driven system design concept for disposing of spent nuclear fuels Yan CAO, Argonne National Laboratory, USA	WEOLI15 Secondary neutron production from patients during hadron therapy and their potential risks: The other side of hadron therapy Anwar CHAUDHRY, University of Erlangen-Nuremberg, Germany

16:10 - 16:45 **Coffee Break in the Exhibition and Poster Area (Level 2)**

16:45 - 18:00	POSTERS Accelerators for ADS and ADS experiments / WEPAD (Level 2, see Poster List page 18)
	POSTERS Nuclear Data / WEPND (Level 2, see Poster List page 19)
	POSTERS Material Research with Accelerators / WEPMA (Level 2, see Poster List page 19)

Plenary Talks - Ambassador Room (Level 0)	
08:30 - 09:00	Accelerators in the Life Sciences 3 THZLI01 Proton and light ion accelerators for cancer therapy George COUTRAKON, Northern Illinois University, USA
09:00 - 09:30	High Power Proton Accelerators and Spallation Targets 3 THZTA02 Target operational experience at the Spallation Neutron Source Bernard RIEMER, Oak Ridge National Laboratory, USA

Ambassador Room (Level 0) Chair: Carol JOHNSTONE		Beethoven Room (Level 1) Chair: John GALAMBOS	
Accelerators in the Life Sciences 3		High Power Proton Accelerators and Spallation Targets 3	
09:35 - 09:55	THOLI03 Prompt Gamma imaging in proton therapy: Towards the construction of a full-size prototype Damien PRIEELS, Ion Beam Applications, Belgium	THOTA03 The RaDIATE collaboration R&D program: Status and update Kavin AMMIGAN, Fermi National Accelerator Laboratory, USA	
09:55 - 10:15	THOLI04 Innovative tools and techniques for particle imaging for hadrontherapy Patrick LE DÛ, IPNL Groupe CAS, France	THOTA04 Target module, inner reflector plug, and proton beam window design updates at the spallation neutron source Bernard RIEMER, Oak Ridge National Laboratory, USA	
10:15 - 10:35	THOLI05 Transmission imaging using therapeutic ion beams Ilaria RINALDI, Heidelberg University Clinic, Germany	THOTA05 First investigations of possibilities for a through-going UCN tube at the ESS E.B. KLINKBY, European Spallation Source ESS AB, Sweden	

10:35 - 11:00 **Coffee Break in the Exhibition and Poster Area (Level 2)**

Plenary Talk - Ambassador Room (Level 0)	
11:00 - 11:30	Accelerators for ADS and ADS Experiments 2 THYAD06 The importance of ADS in nuclear fuel cycle Haihong XIA, State Nuclear Power Research Institute, China

Ambassador Room (Level 0) Chair: Carol JOHNSTONE		Beethoven Room (Level 1) Chair: Dirk VANDEPLASSCHE	
Accelerators in the Life Sciences 3		Accelerators for ADS and ADS Experiments 2	
11:35 - 11:55	THOLI07 Ion computed tomography: The MGH experience Joao SECO, ³ Massachusetts General Hospital, USA	THOAD07 PNS measurement of the neutron multiplication factor in deeply subcritical states for ADS on example of YALINA-thermal assembly Sergey SADOVICH, National Academy of Sciences of Belarus	

11:55 - 12:15	THOLI08 A detector for proton computed tomography George COUTRAKON, Northern Illinois University, USA	THOAD08 Optimization studies for a MYRRHA mock-up configuration in the VENUS-F facility Luigi MERCATALI, Karlsruhe Institute of Technology, Germany
12:15 - 12:35	THOLI09 Built in online-PET system of sumitomo proton therapy system Hideki NONAKA, Sumitomo Heavy Industries, Japan	THOAD09 The MYRRHA linear accelerator R&D program Roberto SALEMME, SCK•CEN, Mol, Belgium

12:35 - 14:05 **Lunch Break in the Exhibition and Poster Area (Level 2)**

Ambassador Room (Level 0) Chair: Stuart HENDERSON		Beethoven Room (Level 1) Chair: John GALAMBOS	
Accelerator Design and Technology 2		High Power Proton Accelerators and Spallation Targets 3	
14:05 - 14:25	THOAT10 High-power hadron and electron accelerator components Anthony FAVALE, Advanced Energy Systems, USA	THOTA10 Optimization of cold neutron beam extraction at ESS Troels SCHOENFELDT, DTU - NuTech, Denmark	
14:25 - 14:45	THOAT11 Comparison of FLUKA predictions to measurements of induced activities of shielding and environmental samples irradiated with 2.5 GEV electrons at the Pohang light source Mario SANTANA LEITNER, SLAC National Accelerator Laboratory, USA	THOTA11 Thermal neutron beam characterization measurements at the Manuel Lujan Jr. Neutron scattering center Michal MOCKO, Los Alamos National Laboratory, USA	
14:45 - 15:05	THOAT12 The new IBA Superconducting Synchrocyclotron (S2C2): From modeling to reality Emma PEARSON, Ion Beam Applications, Belgium	THOTA12 Reliability and risk analysis of the European Spallation Source, ESS Peter JACOBSSON, European Spallation Source ESS AB, Sweden	

Plenary Talk - Ambassador Room (Level 0)

15:10 - 15:40	Accelerator Design and Technology 2 THYAT13 Technology development for future superconducting CW hadron accelerators Peter OSTROUMOV, Argonne National Laboratory, USA
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15:40 - 16:00 **Concluding Remarks: THZZ**
Andrew HUTTON, Jefferson Lab., USA

Poster List Monday, August 5

Accelerator Facilities

- MOPFA01 **Challenges of simultaneous multiple ion beams implantations**
O. TOADER*, F. Naab
*University of Michigan, USA
- MOPFA02 **Trace elemental mapping of camel teeth and bones from Sudan using nuclear microprobe technique**
M.E.M EISA*, C.A. Pineda-Vargas, A.O. Bakhiet, A. Aziz Makkawi, Z. Mohammed, R. Rossouw, S. Naidoo
*Northern Border University, Kingdom of Saudi Arabia
- MOPFA03 **Upgrade concept of multipurpose ITEP-TWAC accelerator complex**
N.N. ALEXEEV*, P.N. Alekseev, V. Andreev, A.N. Balabaev, V.N. Balanutsa, A.A. Golubev, M.M. Kats, A. Kolomiets, V.I. Nikolaev, A.S. Ryabtsev, Yu. A. Satov, V.S. Stolbunov, V.A. Schegolev, B. Yu. Sharkov, A.V. Shumshurov, V.P. Zavodov
*ITEP, Russia
- MOPFA04 **Electron accelerator for R&D study and radiation processing**
Z. ZIMEK*, P. Duch, K. Roman
*Institute of Nuclear Chemistry and Technology, Poland
- MOPFA05 **Challenges in developing a 3 MEV 15 MA high power proton accelerator**
D. Joassin, J.L. BOL*, R. Galloway, C. Fostier
*Ion Beam Applications, Belgium
- MOPFA06 **Neutronic design of fast neutron irradiation ports for the European spallation source**
A. MILOCCO*, G. Gorini, L. Zanini, F. Mezei, S. Ansell
*Milano-Bicocca University, Italy

High Power Proton Accelerators and Spallation Targets

- MOPTA02 **Thermal analysis of a 100kW collimator in PSI's high intensity proton accelerator**
R. SOBBIA*, P. Baumann, D. Laube, A. Strinning, D. Kiselev
*Paul Scherrer Institut, Switzerland
- MOPTA03 **Helium management of the ESS target and monolith systems**
P. NILSSON*, R. Linander, A. Lundgren, C. Kharoua, P. Sabbagh, F. Plewinski, F. Mezei, E. Pitcher
*European Spallation Source ESS AB, Sweden
- MOPTA04 **ESS target station hot cells and logistics**
M. GÖHRAN*, M. Reungoat, D. Ene, S. Gallimore, R. Linander, F. Mezei, F. Plewinski
*European Spallation Source ESS AB, Sweden
- MOPTA05 **Project X target station**
D. WOOTAN*, D. Asner, D. Senior, M. Peterson, R. Tschirhart, P. Hurh, S. Mishra
*Pacific Northwest National Laboratory, USA
- MOPTA06 **Cooling of pulse heated canned rods**
P. NILSSON*, P. Sabbagh, Y.J. Lee, P. Sievers
*European Spallation Source ESS AB, Sweden
- MOPTA07 **Aspects of thermo-hydraulic design and performance optimization of the ESS helium cooled rotating tungsten target**
Y. Chen, X.Z. Jin, S. Kecskes, B.E. GHIDERSA*
*Karlsruhe Institute of Technology, Germany
- MOPTA08 **A physical design of a neutron irradiation beamline**
Q. Z. YU*, T. J. Liang, W. Yin
*Chinese Academy of Sciences, China

- MOPTA09 **Safety considerations for the European Spallation Source, ESS**
P. JACOBSSON*, F. Plewinski
*European Spallation Source ESS AB, Sweden
- MOPTA10 **Engineering requirements on liquid hydrogen moderators for high power spallation sources**
Y. Beßler, M. BUTZEK*, C. Tiemann, J. Wolters
*Forschungszentrum Jülich GmbH, Germany
- MOPTA11 **An overview of safety control system for ESS target station**
A. SADEGHZADEH*, F. Plewinski, A. Nordt
*European Spallation Source AB, Sweden
- MOPTA12 **RF conditioning of high power input couplers for superconducting cavities**
M. EL KHALDI*, A. Gallas, W. Kaabi, P. Lepercq, C. Magueur, A. Thiebault, A. Verguet, A. Variola
*Laboratoire de l'Accélérateur Linéaire (LAL), France
- MOPTA13 **Induced radioactivity in the CERN Linac4: A new 160 MeV proton linac**
F.P. LA TORRE*, M. Silari
*CERN, Switzerland
- MOPTA14 **The ESS-BILBAO target station design**
A. GHIGLINO*, F. Martinez, J.P. de Vicente, R. Vivanco, F.J. Bermejo, J.M. Perlado, F. Sordo, S. Terron, M. Magan
*Consorcio ESS-BILBAO, Spain
- MOPTA15 **Assessment of the radioactive inventories for ESS 5 MW target station in terms of the waste characterization for final disposal**
D. ENE*, F. Mezei
*European Spallation Source ESS AB, Sweden
- MOPTA16 **Activation and waste management analyses for SNS**
I.I. POPOVA*, F.X. Gallmeier, S. Trotter, M. Dayton
*Oak Ridge National Laboratory, USA

Poster List Tuesday, August 6

Accelerators in the Life Sciences

- TUPLI01 **The utilization of the accelerators for the analysis of camels hard tissues from Sudan**
M.E.M EISA*, C.A. Pineda-Vargas, A.O. Bakhiet, R. Rossouw, S. Naidoo
*Sudan University of Science & Technology, Sudan
- TUPLI02 **Activation analysis using medium-energy proton beam from AIC-144 cyclotron**
A.K. WÓJCIK*, J.W. Mietelski, R. Misiak, P. Zagrodzki, E. Łokas
*The Henryk Niewodniczański Institute of Nuclear Physics of the Polish Academy of Sciences, Poland
- TUPLI03 **Measurement of neutron contamination around radiotherapeutic linacs**
M. KRÁLÍK*, J. Šolc, J. Šmoldasová
*Czech Metrology Institute, Czech Republic
- TUPLI04 **Benchmark calculations of neutron production and induced radioactivity for a proton and a carbon therapy accelerator**
R.J. SHEU*, Y.C. Hsu
*National Tsing Hua University, Taiwan
- TUPLI05 **Application of ion accelerators for hadrontherapy and isotope production**
P.N. OSTROUMOV
Argonne National Laboratory, USA
- TUPLI06 **SS316L as window for production target for Ge-68**
I. SILVERMAN*, D. Kijel, A. Arenshtam, L. Weismann, A. Kreisel, I. Eliyahu, E. Zemach, G. Shimel, I. Gavish, E. Meroz
*Soreq, Israel
- TUPLI07 **Compact accelerators for the production of isotopes for PET and SPECT**
S. Albright, R. BARLOW*, R. Cywinski, R. Edgecock, C. Johnstone, N. Ratcliffe, R. Seviour, S. Sheehy
*Huddersfield University, UK
- TUPLI08 **Activation cross-section measurement of deuteron induced reactions on cerium for applications in biology and medicine and for development of reaction theory**
F. TÁRKÁNYI, A. HERMANNE, S. TAKÁCS, F. DITROI*, A.V. IGNATYUK
*Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI), Hungary
- TUPLI09 **Exploring alternative pathways of MO-99 production**
M. MOCKO*, Ch.T. Kelsey, G.E. Dale
*Los Alamos National Laboratory, USA
- TUPLI10 **PIXE analysis of three kinds of vegetables from Sudan using low energy van de Graaf accelerator**
M.E.M EISA*, C.A. Pineda-Vargas
*Sudan University of Science & Technology, Sudan
- TUPLI11 **Accelerator production of Ac-225 for generating Bi-213 for targeted alpha therapy**
M.A. CHAUDHRI*, M.N. Chaudhri
*University of Erlangen-Nuremberg, Germany
- TUPLI12 **Non-destructive fluorine profiling to larger depths: A novel method**
M.A CHAUDHRI*, M.N. Chaudhri
*University of Erlangen-Nuremberg, Germany

Accelerator Design and Technology

- TUPAT01 **Extension of the Liège intra nuclear cascade model to spallation reactions at a few GEV incident energy**
J. CUGNON*, A. Boudard, J.-C. David, S. Leray, D. Mancusi
*University of Liège, Belgium
- TUPAT02 **Use of the Monte-Carlo code FLUKA for radiation protection studies around the PS accelerator complex at CERN**
J. VOLLAIRE*, S. Damjanovic, S. Giron, S. Roesler
*CERN, Switzerland
- TUPAT03 **Accelerators for GEM*STAR applications**
R.P. JOHNSON*, G. Flanagan, F. Marhauser
*Muons, USA
- TUPAT04 **Performances and reliability needs for the cryogenic system of the MYRRHA SC linac**
T. JUNQUERA*, N.R. Chevalier, J.P. Thermeau, L. Medeiros Romão, D. Vandeplassche
*Accelerators and Cryogenic Systems, France
- TUPAT05 **Radiation levels at CERN's injectors and their impact on electronic equipment**
J.P. SARAIVA*, M. Brugger
*CERN, Switzerland
- TUPAT06 **Development of beam flattening system using non-linear beam optics at J-PARC**
S. MEIGO*, M. Ohi, K. Ikezaki, A. Akutsu, H. Fujimori
*Japan Atomic Energy Agency, Japan

Poster List Wednesday, August 7

Accelerators for ADS and ADS Experiments

- WEPAD01 **Accelerator driven system with current technology**
T.Y. LEE*, H.S. Lee
*Pohang Accelerator Laboratory, Korea
- WEPAD02 **Study on the structural integrity of beam window for TEF target**
H. TAKEI*, H. Obayashi, H. Iwamoto, H. Kogawa, T. Sasa
*Japan Atomic Energy Agency, Japan
- WEPAD03 **Radiation safety aspects of target system for accelerator-based sub-critical nuclear reactor**
H.S. LEE*, T.Y. Lee
*Pohang Accelerator Laboratory, Korea
- WEPAD04 **Contribution of experiments with neutrons and gamma rays at the radiation source ELBE to transmutation related projects like ERINDA**
R. Beyer, E. Grosse, R. Hannaske, A.R. Junghans, T. Kögler, R. MASSARCZYK*
*Institut für Strahlenphysik, Germany
- WEPAD05 **Parametric study of spallation targets for the MYRRHA reactor using MCNPX simulations and neural networks**
A.L.P. REBELLO Jr.*, A.S. Martinez, A.C. Gonçalves
*Federal University of Rio de Janeiro, Brazil
- WEPAD06 **Power gain in ADS with subcritical reactor and fissile target**
A.G. GOLOVKINA*, D.A. Ovsyannikov, I.V. Kudinovich, A.A. Bogdanov
*Saint-Petersburg State University, Russia
- WEPAD07 **Shielding design analyses of KIPT neutron source facility**
Z. ZHONG*, Y. Gohar
*Argonne National Laboratory, USA
- WEPAD08 **Effect of spallation target parameters on MA&LLFP transmutation of accelerator driven system**
T.J. LIANG*, F. Shen, Q.Z. Yu, W. Yin, Z.L. Hu, Z.E. Yao
*Chinese Academy of Sciences, China
- WEPAD09 **Computational calculations for neutron flux multiplication by a cascade model**
K.O. LEE*, B.H. Choi, K.H. Chung, S.J. Noh
*PTL/KAPRA/Cheorwon, Republic of Korea
- WEPAD10 **Physics design of an electron-beam driven neutron generator**
K.O. LEE*, B.H. Choi, K.H. Chung, S.J. Noh
*PTL/KAPRA/Cheorwon, Republic of Korea

Material Research with Accelerators

- WEPMA01 **Characterization and ageing of Ce-doped scintillating fibers using a standard pet cyclotron**
V. Nuttens, C. Fostier, D. PRIEELS*
*Ion Beam Applications, Belgium
- WEPMA02 **A vertical compact ion implanter for novel applications in biotechnology and gemology**
S. Singkarat, A. Wijaikhum, D. Suwannakachorn, M.W. Rhodes, R. Suwankosum, S. Rattanarin, S. Intarasiri, D. Bootkul, L.D. YU*
*Chiang Mai University, Thailand
- WEPMA03 **Investigation of the ⁷Be activation cross sections for proton and deuteron induced nuclear reactions on B, Be, C, Mg, Al, Si for purpose of thin layer activation (TLA)**
F. Tárkányi, A. Hermanne, S. Takács, F. DITRÓI*
*Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI), Hungary
- WEPMA04 **Optical modification of ion beam implanted materials—optical waveguide anisotropy in rutile**
J. Rickards, R. TREJO-LUNA*, G.V. Vázquez, E. Flores-Romero, J.M. Hernández
*Universidad Nacional Autónoma de México
- WEPMA05 **Advanced silicon carbide and aluminum oxide with unidirectional open porosity as new prototype target materials for radioisotope beam production**
M. CZAPSKI*, T. Stora, R. Santos Augusto, C. Tardivat, S. Deville, J. Leloup, F. Bouville, R. Fernandes Luis
CERN, Switzerland
- WEPMA06 **Identification of artificial blocks in the Pyramids of Egypt using nuclear microprobe elemental analyses**
G. DEMORTIER*, L. Csedreki, E. Furu, Z. Török, I. Uzonyi
*University of Namur, Belgium
- WEPMA07 **Specialized ion implanter for semiconductor detectors**
R. Nurgalejev, A. Sokolov, V. GOSTILO*
*Baltic Scientific Instruments, Latvia
- WEPMA08 **Rutherford back-scattering and X-ray fluorescence analysis for the examination of corroded surfaces**
M.A CHAUDHRI
University of Erlangen-Nuremberg, Germany

Nuclear Data

- WEPND01 **Calibration of a large acceptance neutron detector array using the photodisintegration of the deuteron**
J.D. STOCK*, D.S. Dale, O. Kosinov
*Idaho State University, USA
- WEPND02 **Excitation function of the ^{NAT}TA(P,X)^{178M2}HF reaction**
Yu.E. TITARENKO* K.V. Pavlov, V.I. Rogov, A.Yu. Titarenko, S.N. Yuldashev, V.M. Zhivun, A.V. Ignatyuk, S.G. Mashnik, S. Leray, A. Boudard, J.C. David, J. Cugnon, D. Mancusi, Y. Yariv, K. Nishihara, N. Matsuda, H. Kumawat, A.Yu. Stankovskiy
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