



## Program of PHITS workshop 2025 @ Mirai-base, Tokai, Japan

Feb. 18 (Tue)	Feb. 19 (Wed)	Feb. 20 (Thu)	Feb. 21 (Fri)
9:20-9:50: Registration	9:10-10:20: O4 (Application I)	9:10-10:20: O8 (Application V)	9:10-10:40: PHITS intermediate course (detector response or Therapy)
9:50-11:50: Opening and O1 (Recent development)	10:20-11:50: O5 (Application II)	10:20-11:50: O9 (Application VI)	10:40-11:00: Summary and discussion
11:50: Lunch & group photo	11:50: Lunch	11:50: Lunch	11:40: Lunch
13:20-15:10: O2 (Benchmark I)	13:20-15:10: O6 (Application III)	13:20-14:50: O10 (Application VII + Education)	13:30-16:00: Technical tour (J-PARC) or Q&A
15:10-16:00: P1 (Poster session I)	15:10-16:00: P2 (Poster session II)	14:50-15:20: PHITS intermediate course (autorun+options or VR)	16:00: Q&A
16:00-18:10: O3 (Benchmark II)	16:00-17:50: O7 (Application IV)	17:40-18:00: Official dinner	
18:10-18:30: Welcome party			
20:30:			

### Tuesday, 18 February 2025

9:20-9:50 Registration

09:50-10:05 Announcement (Tatsuhiko Ogawa, JAEA)

10:05-10:10 Welcome message (Toshiyuki Monma, Executive Director of JAEA)

10:10-10:15 Opening message (Koji Niita, RIST)

10:15-11:50 PHITS workshop (O1. Recent development) Chair: Tatsuhiko Ogawa

O1-1. General features and recent progresses of PHITS, Tatsuhiko Sato, Japan Atomic Energy Agency, Japan

O1-2. Track-structure and water-radiolysis simulation in PHITS, Yusuke Matsuya, Hokkaido Univ., Japan

O1-3. New physics and visualization, Yasuhito Sakaki, KEK, Japan

O1-4. Introduction to RadioTherapy package based on PHITS (RT-PHITS), Takuya Furuta, Japan Atomic Energy Agency, Japan

O1-5. New Features in the Upcoming Version of PHIG-3D, Seiki Ohnishi, National Maritime Research Institute, Japan

O1-6. Features and applications of the DCHAIN-PHITS activation code, Hunter Ratliff, Western Norway University of Applied Sciences, Norway

(lunch) + Group photo

13:20-15:10 PHITS workshop (O2. Benchmark I) Chair: Tatsuhiko Ogawa

O2-1. Assessing Secondary Cosmic Ray Propagation and Atmospheric Ionization Using the BIOSPHERE Measurement Campaigns and PHITS/MCNP6 Simulation Codes, Amer Al-Qaaod, Physikalisch-Technische Bundesanstalt (PTB), Germany

- O2-2. Neutron Yield Predictions with Artificial Neural Networks: A Predictive Modeling Approach, Benedikt Schmitz, Institute of Nuclear Physics, TU Darmstadt, Germany
- O2-3. Simulations of Tritium Production in Various Materials Using PHITS and FLUKA Codes, Dali Georgobiani, Fermi National Accelerator Laboratory, USA
- O2-4. Optimization and Evaluation of the Monte Carlo Simulation Model for Various Irradiation Systems and Detectors Utilizing the PHITS Code, Dat Nguyen-Thanh, Ho Chi Minh City University of Education, Vietnam
- O2-5. Activation Characteristics of Concrete Shielding Walls Induced by High-Energy Particle Beams, Euna Lee, Hanyang University, South Korea
- O2-6. Reactor Radiological Characterization using DCHAIN from Reactor Core Source Generated by OpenMC Flux Tally for Reactor Decommissioning Strategic Plan, Handy Tri Lunar Nugraha, Universitas Gadjah Mada, Indonesia
- O2-7. Estimation of neutron induced activity around radioisotope production cyclotron using PHITS, Geant4 and FLUKA, Jonathan Collin, University of Strabourg, France

15:10-16:00 PHITS workshop (P1. Poster session I)

16:00-18:10 PHITS workshop (O3. Benchmark II) Chair: Hiroshi Iwase

- O3-1. Investigation of the depth-dose distributions of heavy ions employed in hadron therapy utilizing PHITS code, Hassane El Bekkouri, Ibn Tofail University, Morocco
- O3-2. Direct Production of Both Gallium-68 and Technetium-99m Using the Natural Isotopic Compositions as the Main Targets, Luis Fernando Salas Tapia, The university of Tokyo, Japan
- O3-3. Code-to-code comparison for the Monte Carlo, Luna Sobczak, University Paris-Saclay, CEA, France
- O3-4. Compendium on Monte Carlo simulation of photoneutrons in the Giant Dipole Resonance energy range: the first five elements, Louis Garnaud, CEA, France
- O3-5. Characterization of Secondary Neutron Spectra from Therapeutic Proton and Carbon Ion Beams Using PHITS Simulation, Mohamed El-Asery, Ibn Tofail University, Morocco
- O3-6. Extension of Intranuclear Cascade Framework for Cluster-Induced Nuclear Reactions in the Intermediate Energy Range, Monira Jannatul Kobra, University of Rajshahi, Bangladesh
- O3-7. Neutronic Property Estimation of a Self-cooled Lithium-Lead Blanket Mockup at the IFMIF-DONES Irradiation Environment using PHITS and JENDL/DEU-2020, Takeo Nishitani, Kyoto Fusioneering Ltd / Nagoya University, Japan
- O3-8. Radiation Study for the Pion Production System of the COMET Experiment at J-PARC, Yusuke Uchiyama, KEK, Japan

18:30-20:30 (Welcome party, 6000 yen for staffs & 3000 yen for students, CASH only!)

### **Wednesday, 19 February 2025**

9:10-10:20 PHITS workshop (O4. Application I) Chair: Shinichiro Abe

- O4-1. PHITS Use at FRIB: Recent Highlights, Thomas Nelson Ginter, Michigan State

University, USA

- O4-2. Designing lightweight neutron absorbing composites using a comprehensive absorber areal density metric, Andrew O'Connor, University of Florida, USA
- O4-3. PHITS MC Optimisation of a table-top NRTA system for small nuclear material sample analysis, Cebastien Joel Guembou Shouop, Japan Atomic Energy Agency, Japan
- O4-4. How to change neutron ambient dose equivalent in LINAC's room, Dang Quoc Soai, Hanoi Oncology Hospital, Vietnam

(Coffee break)

10:40-11:50 PHITS workshop (O5. Application II) Chair: Shinichiro Abe

- O5-1. Lead-Free Yb<sub>2</sub>O<sub>3</sub>-Doped Transparent Phosphate Glasses for Radiation Shielding: Analytical and PHITS Monte Carlo Analysis, Devendra Raj Upadhyay, Tribhuvan University, Nepal
- O5-2. Monte Carlo study of neutron contamination from high-energy medical linac, Dewa Ngurah Yudhi Prasada, Universitas Udayana, Indonesia
- O5-3. Evaluation of human equivalent phantom applicability of low-cost 3D filaments by absorbed dose measurement of radiophotoluminescence dosimeter and Monte Carlo simulations, Donghee Han, Kyushu Univ., Japan
- O5-4. Nuclear analysis on the magnetic systems of compact fusion reactors with the Monte Carlo code PHITS, Federico Ledda, Politecnico di Torino, Italy

(lunch)

13:20-15:10 PHITS workshop (O6. Application III) Chair: Nobuhiro Shigyo

- O6-1. Application of PHITS in Muography Imaging Techniques, Hamid Basiri, The University of Tokyo, Japan
- O6-2. Simulation study on the characteristics of thundercloud-related radiation emitted from atmospheric electric fields, Harufumi Tsuchiya, Japan Atomic Energy Agency, Japan
- O6-3. PHITS Simulations for the design of HBS: A High Brilliance accelerator-based neutron Source, Jing Jing Li, Forschungszentrum Jülich GmbH, Germany
- O6-4. Application of additive manufacturing technology in Linac X-ray and synchrotron microbeam radiation therapy: From dosimetry to radiobiology, John Paul O. Bustillo, University of Wollongong Australia, Australia
- O6-5. Evaluation of cosmic rays damage and linear energy transfer on hybrid and inorganic halide lead perovskites in space environment, Joseph Omojola, North-West University, South Africa
- O6-6. Development of a composite neutron converter for DDTTNY measurements: A Monte Carlo simulation study, Kawchar Patwary, Comilla University, Bangladesh
- O6-7. Optimizing a Photoneutron Source for Bragg Edge Imaging and Reproducing Bragg Edges of an  $\alpha$ -Fe Sample Using PHITS Code, Mahdi Bakhtiari, Pohang Accelerator Laboratory, South Korea

15:10-16:00 PHITS workshop (P2. Poster session II)

16:00-17:50 PHITS workshop (O7. Application IV) Chair: Yusuke Matsuya

- O7-1. Design of Self-Cooled Lithium-Lead Fusion Blanket and Analysis of Tritium Breeding Performance with PHITS, Maxim Monange, EX-Fusion America Inc., USA
- O7-2. Lithium battery in-depth analysis with MIXE: setup and simulations with PHITS., Maxime Lamotte, Paul Scherrer Institute, Switzerland
- O7-3. Advancement of Phosphate Glasses Doped with Bismuth Oxide for Photon Shielding Applications, Ornattha Ornketchon, Chiang Mai university, Thailand
- O7-4. Dosimetric study of a Co-60 HDR Brachytherapy Source using PHITS, Patrick Vincent Aquino, Batangas Medical Center, Philippines
- O7-5. Shielding Optimization: An Approach for Extending PHITS with Machine Learning, Rajarshi Pal Chowdhury, Facility of Rare Isotope Beams, Michigan State University, USA
- O7-6. Validation of Particle and Heavy Ion Transport Code System (PHITS) in generating dose-voxel kernels for internal dosimetry calculations, Shalaine Sana Tatu, Philippine Nuclear Research Institute / Taylor's University, Philippines / Malaysia
- O7-7. Small-scale bone marrow dosimetry study for  $^{225}\text{Ac}$ , Stephen Tronchin, The University of Adelaide, Australia

#### **Thursday, 20 February 2025**

9:10-10:20 PHITS workshop (O8. Application V) Chair: Yuho Hirata

- O8-1. Neutron spectrometry with DIAMON detector for characterisation of a newly built neutron calibration facility at SCK CEN, Sita Gandes Pinasti, SCK CEN, Belgium
- O8-2. Reduction of the Added Reflected Dose Component at the Patient Location Within a Brachytherapy Room for an Ir-192 Gamma Source: A Monte Carlo Study, Suffian Bin Mohamad Tajudin, Universiti Sultan Zainal Abidin, Malaysia
- O8-3. Determination of mass attenuation coefficient for some Taif City rock samples using XCOM and EPIX simulations, Sultan J. Alsufyani, Ayman M. Abdalla, Rawabi AlThoi, Taif University / Najran University, Saudi Arabia
- O8-4. Cosmic-ray exposure assessment using particle and heavy ion transport code system: case study Douala-Cameroon, Takoukam Soh Serge Didier, University of Yaounde I, Cameroon

(Coffee break)

10:40-11:50 PHITS workshop (O9 Application VI) Chair: Yuho Hirata

- O9-1. Bayesian Optimization of a HPGe detector for 3D activity reconstruction in radioactive waste drums, Victor Jose Casas Molina, SCK CEN / Ghent University, Belgium
- O9-2. Establishing dose coefficients for common paediatric diagnostic fluoroscopic examinations in support of ICRP Task Group 113, Wyatt William Smither, University of Florida, USA
- O9-3. Exploring the energy deposition patterns of proton at macro and microscale using

PHITS software, Xianghui Kong, The Hong Kong Polytechnic University, China  
O9-4. Constructions of mesh-type cell models and their application research based on PHITS, Yidi Wang, QST, Japan

(lunch)

13:20-14:50 PHITS workshop (O10. Application VII & Education) Chair: Takuya Furuta  
O10-1. Analysis of Materials and Thickness of 230 MeV Cyclotron Room Shielding for Proton Beam Therapy using Particle and Heavy Ion Transport Code System Program, Yohannes Sardjono, National Research and Innovation Agency (BRIN), Indonesia  
O10-2. Calculation of the Skyshine Radiation Measurement in Baikal-1 RA Research Reactor using PHITS code, Yusuke Yasuno, Mitsubishi Nuclear Fuel Co., Ltd, Japan  
O10-3. Education on optimizing radiation protection in X-ray fluoroscopy-guided procedures using extended reality, Toshioh Fujibuchi, Kyushu University, Japan  
O10-4. Experience with PHITS Code in the research and training programs at the Nuclear Engineering Area of Technical University of Madrid (Spain), Gonzalo Felipe Fernandez Garcia, Technical University of Madrid, Spain  
O10-5. Concepts for Enhancing the North American PHITS Community, Thomas Nelson Ginter, Michigan State University, USA

(Coffee break)

15:20-17:40 PHITS Intermediate course  
Autorun + Options (Tatsuhiko Ogawa) or Variance reduction (Tatsuhiko Sato)

18:00-20:30 (official dinner, 8000 yen for staffs & 5000 yen for students, CASH only!)

## **Friday, 21 February 2025**

9:10-10:40 PHITS Intermediate course  
Detector response (Tatsuhiko Ogawa) or X-ray therapy (Takuya Furuta)

11:00-11:40 Summary & Discussion Chair: Tatsuhiko Sato

(lunch)

13:00-15:30 Technical tour (J-PARC) / Q&A  
16:00-17:30 Q&A

## **Poster Session I**

P1-1. Design study of the neutron source for the neutron shielding performance test at NDPS of RAON, Cheolmin Ham, Institute for Basic Science, South Korea  
P1-2. Development of a Bonner Sphere Spectrometer for Aviation Neutron Monitoring, Felipe Lopes Frigi, Aeronautics Institute of Technology, Italy  
P1-3. Modeling a list-mode multi-coincidence detection system for neutron and gamma-ray imaging in PHITS, Hunter N. Ratliff, Western Norway University of

Applied Sciences, Norway

- P1-4. Evaluation of Parallel Computing on MPI Version PHITS Code, Hyeokjun Gwon, Korea Institute of Radiological & Medical Science, South Korea
- P1-5. Computational evaluation of a two-source neutron irradiator, Jayms S. Sagana, Mapúa University, Philippines
- P1-6. Calculation of Absorbed Dose Measurements by Fiber-optic Personnel Radiation Dosimeters through Particle and Heavy Ion Transport code System (PHITS) Simulations, Joaquin Marcquo S. Andal, University of Santo Tomas, Philippines
- P1-7. Development of Directional vector based Quick evaluation method for Protective plate Effects in X ray fluoroscopy (DQPEX), Kyoko Hizukuri, Kyushu University, Japan
- P1-8. Simulation of chest posteroanterior x-ray procedure using stylized phantom and PHITS, Michaela Marie Subion Sta. Ana, University of Santo Tomas, Philippines
- P1-9. Simulation Study of Thick Target Neutron Production for NDPS at RAON, Jaesung Kim, Institute for Rare Isotope Science, Institute for Basic Science, South Korea

## **Poster Session II**

- P2-1. Problem Formulation Using PHITS to Estimate Types and Depth Distribution of Radioactive Isotopes in Soil, Kanata Nokubo, Kagawa University, Japan
- P2-2. Simulation of Radiological Leakage in a Teletherapy Bunker Using PHITS, Noor Farhana Husna A. Aziz, Malaysian Nuclear Agency, Malaysia
- P2-3. Particle Bombardment on Liquid Metal Plasma Facing Components, Nopparit Somboonkittichai, Kasetsart University, Thailand
- P2-4. Design of Si-TlBr Compton Camera Geometry using PHITS for Measuring Prompt Gamma-rays in BNCT, Jiye Qiu, Osaka University, Japan
- P2-5. Exposure Calculation for a Worker with Contaminated Hair, Sangrok Kim, Korea Institute of Radiological and Medical Sciences, South Korea
- P2-6. Feasibility Study of Radiation Shielding Capability and Ion-Matter Interaction Parameters of Common South African Building Bricks Using PHITS Monte Carlo Code, Stephen Friday Olukotun, North-West University, South Africa
- P2-7. Neutronics Progress in Conceptual Design of the Self-Cooled Lithium-Lead SCYLLA Blanket for a Spherical Tokamak, Jun Takamine, Kyoto Fusioneering Ltd, Japan
- P2-8. Monte Carlo Simulation Based Dose Calculation for Varian 2100 CD Linac: A Comparative Study with Clinical Algorithms in Homogeneous and Heterogeneous Media, Tanny Bepari, Gono Bishwabidyalay, Bangladesh
- P2-9. Study of INC model for alpha inelastic scattering at 230 MeV/u, Toshimaza Furuta, Kyushu University, Japan