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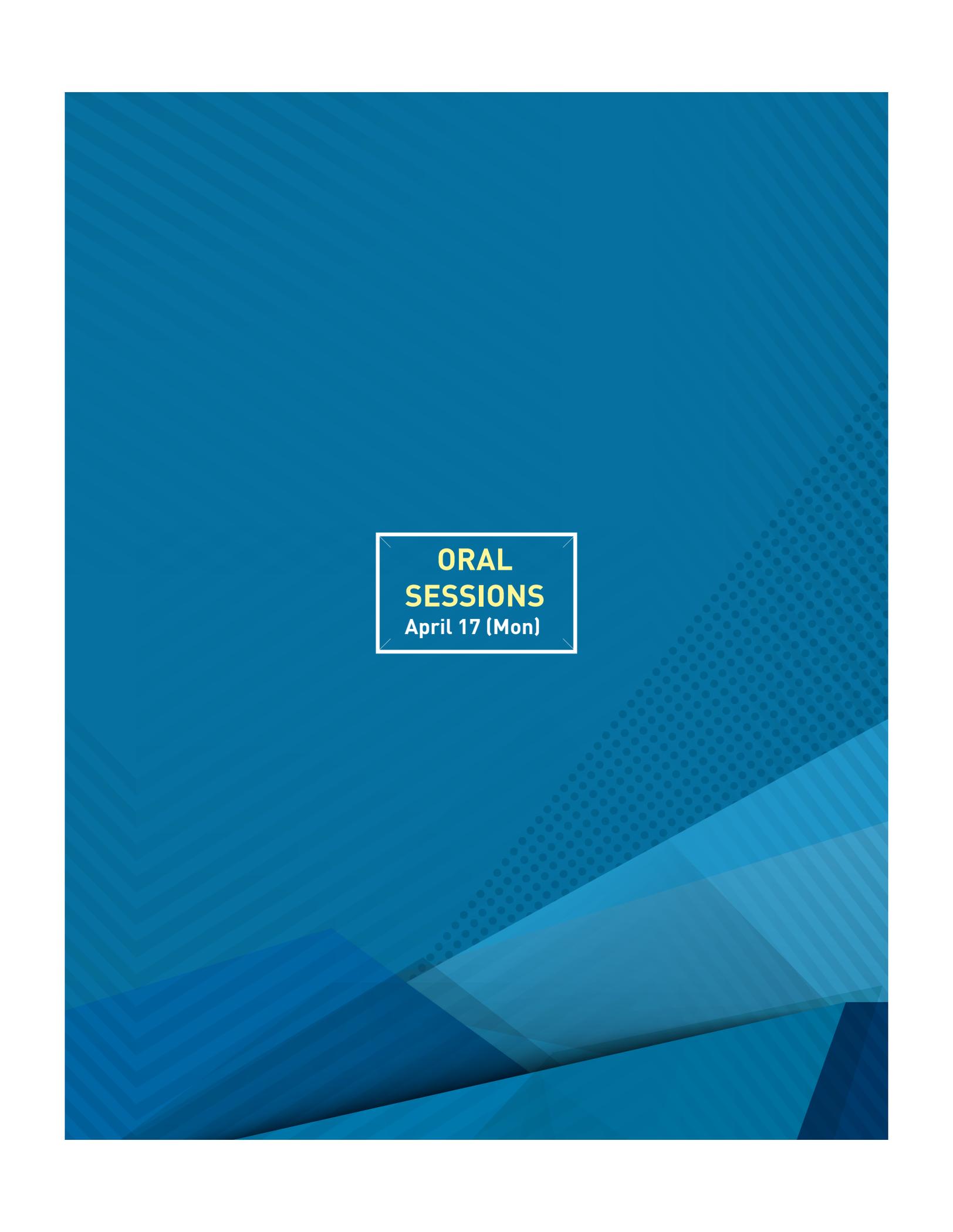
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**ORAL
SESSIONS**
April 17 (Mon)

Oral Session No. 1 [OS1H-I]

Samda A (3F)

April 17 (Mon), 13:20 – 15:25

Advanced 2D/3D MOC I

Chairs Igor Zmijarevic (CEA), Ser Gi Hong (KHU)

- P047** 13:20 Acceleration of Step and Linear Discontinuous Schemes for the Method of Characteristics in DRAGONS
Alain Hébert
École Polytechnique de Montréal
- P050** 13:45 Particle Conservation and the Linear Source Method of Characteristics for Isotropic and Anisotropic Sources
Rodolfo M. Ferrer and Joel D. Rhodes III
Studsvik Scandpower, Inc.
- P051** 14:10 CACTUSOT: A 3D Method of Characteristics Solver in WIMS
J. G. Hosking, B. A. Lindley and P. J. Smith
Amec Foster Wheeler
- P052** 14:35 Simulation of TREAT Cores Using High-fidelity Neutronics Code PROTEUS
C. H. Lee, Y. S. Jung, H. M. Connaway and T. A. Taiwo
Argonne National Laboratory
- P054** 15:00 Polynomial Characteristics Method for Neutron Transport in 3D extruded geometries
Laurent Graziano, Simone Santandrea, Daniele Sciannadronne, Igor Zmijarevic*
CEA Saclay

Oral Session No. 2 [OS2A-I]

Samda B (3F)

April 17 (Mon), 13:20 – 15:25

MC with T/H Feedback I

Chairs David Griesheimer (NNL), Shichang Liu (Tsinghua)

- P081** 13:20 Stabilization and convergence acceleration in coupled Monte Carlo–CFD calculations: the Newton method via Monte Carlo Perturbation Theory
Manuele Auferio, Massimiliano Fratoni
University of California
- P082** 13:45 Effect of Subpin Feedback in coupled MCNP6/CTF
Alexander Bennett, Maria Avramova, Kostadin Ivanov
North Carolina State University
- P090** 14:10 MCU Code Precision Calculation of a Full-Scale VVER-1000 Model Considering Feedbacks
A.S. Bikeev, M.A. Kalugin, D.S. Oleynik, Anna I. Shcherenko, D.A. Shkarovsky, M.Y. Tomilov
National Research Center Kurchatov Institute
- P084** 14:35 Preliminary Serpent–MOOSE Coupling and Implementation of Functional Expansion Tallies in Serpent
Leslie Kerby¹, Aaron Tumalak¹, Jaakko Leppänen², and Ville Valtavirta²
¹Idaho State University, ¹Idaho National Laboratory
²VTT Technical Research Centre of Finland
- P086** 15:00 Fission Matrix Interpolation for the TFM Approach Based on a Local Correlated Sampling Technique for Fast Spectrum Heterogeneous Reactors
Axel Laureau, Laurent Buiron, Bruno Fontaine, Vincent Pascal
CEA

Oral Session No. 3 [OS3A]

402 A (4F)

April 17 (Mon), 13:20 – 15:25

Nuclear Data Evaluation and Assimilation

Chairs Giuseppe Palmiotti (INL), Ayman Hawari (NCSU)

- P179** 13:20 Thermal Neutron Scattering Law Data Evaluations for Nuclear Technology Applications
Ayman I. Hawari, Yuwei Zhu, Jonathan L. Wormald, Cole A. Manring, Nina Colby Sorrell
North Carolina State University
- P180** 13:45 Validation of Selected IRDFF Cross Sections in Well-Defined Reactor Spectrum
Michal Košťál, Evžen Losa, Vojtěch Rypar, Davit Harutyunyan, Martin Schulc
Research Centre Rez Ltd
- P181** 14:10 Fitting and Analysis Technique for Inconsistent Nuclear Data
Georg Schnabel
CEA
- P188** 14:35 The Impact of the New Nuclear Data Libraries on the Isothermal Reactivity Coefficient Determination
Adimir dos Santos and Graciete Simões de Andrade e Silva
Instituto de Pesquisas Energéticas e Nucleares
- P183** 15:00 PIA and REWIND: Two New Methodologies for Cross Section Adjustments
G. Palmiotti and M. Salvatores
Idaho National Laboratory

Oral Session No. 4 [OS4A]

402 B (4F)

April 17 (Mon), 13:20 – 15:25

Subcriticality Measurement and Monitoring

Chairs Myung Hyun Kim (KHU), Alberto Talamo (ANL)

- P200** 13:20 Monte Carlo Studies of the Neutron Detector Dead Time Effects on Pulsed Neutron Experiments
Y. Cao*, Y. Gohar, and A. Talamo
Argonne National Laboratory
- P201** 13:45 Application of the Backward Extrapolation Method for Paralyzable and Non-Paralyzable Dead-Time Corrections in Pulsed Neutron Source Experiments
A. Talamo and Y. Gohar
Argonne National Laboratory
- P202** 14:10 Estimation of the External Source Contribution to a Driven Subcritical Reactor
Zafar Iqbal Zafar and Myung Hung Kim*
Kyung Hee University
- P208** 14:35 Advanced Analysis of Subcritical Neutron Noise Experiments
Erez Gilad¹, Chen Dubi², Benoit Geslot³, Patrick Blaise³
¹Ben-Gurion University of the Negev
²Nuclear Research Center NEgev
³CEA Cadarache
- P209** 15:00 Subcritical Copper-Reflected α -phase Plutonium (SCRaP) Measurements and Simulations
J. Hutchinson, R. Bahrn, T. Cutler, W. Monange*, J. Arthur, M. Smith-Nelson, G. Caplin*, E. Dumonteil*
Los Alamos National Laboratory
**Institut de Radioprotection et de Sécurité Nucléaire*

Oral Session No. 5 [OS5A-I]

301 (3F)

April 17 (Mon), 13:20 – 15:25

Uncertainty Quantification in Multiphysics I

Chairs Toshikazu Takeda (Fukui), David Bernard (CEA)

- P212** 13:20 **Uncertainty Analysis for VVER-1000 Core Simulations with MCNP/ATHLET**
Wolfgang Bernnat, Nicole Guilliard, Janis Lapins
Universität Stuttgart
Alexander Aures, Friederike Bostelmann,
Jérémy Bousquet, Kiril Velkov, Winfried Zwermann
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
- P213** 13:45 **LWR-UOx Doppler Reactivity Coefficient: Best Estimate Plus (nuclear and atomic sources of) Uncertainties**
D. Bernard, A. Calame, J-M. Palau
CEA
- P215** 14:10 **Nuclear Data Uncertainty Propagation in Reactor Studies Using the SANDY Monte Carlo Sampling Code**
Luca Fiorito, Matteo Griseri, Alexey Stankovskiy
SCK•CEN
- P216** 14:35 **FISPACT-II Advanced Nuclear Data Uncertainty Quantification and Propagation Methods**
M. Fleming, J-Ch. Sublet and M. R. Gilbert
United Kingdom Atomic Energy Authority
- P219** 15:00 **Uncertainty Estimation of Neutronics Parameters in Minor Actinides Transmutation Fast Reactors**
Toshikazu Takeda
University of Fukui

Oral Session No. 6 [OS6C-I]

302 (3F)

April 17 (Mon), 13:20 – 15:25

Cycle Methods and Optimization I

Chairs David Kropaczek (NCSU), Hyun Chul Lee (PNU)

- P277** 13:20 **Multi-objective Differential Evolution Algorithms for Optimization of Heterogeneous LWR Assemblies**
Alan J. Charles, Geoffrey T. Parks
University of Cambridge
- P278** 13:45 **Modeling Local History Effects in the Nodal Code ARTEMIS™**
Aldo Dall'Osso¹, Greg Hobson²
¹*Areva NP*, ²*Areva Inc*
- P279** 14:10 **Novel Core Physics Heuristics in Advanced Genetic Algorithms for In-Core Fuel Management**
Ella Israeli & Erez Gilad
Ben-Gurion University of the Negev
- P280** 14:35 **Preparatory Studies for Qualification of Lead Test Assemblies with Gadolinium as Burnable Absorber in the BR2 Reactor**
Silva Kalcheva and Geert Van den Branden
SCK•CEN
- P281** 15:00 **Development and Application of a Penalty-Free Method for Addressing Constraints Within Fuel Cycle Optimization Problems**
David J. Kropaczek
North Carolina State University

Oral Session No. 7 [OS1H-II]

Samda A (3F)

April 17 (Mon), 15:50-17:30

Advanced 2D/3D MOC II

Chairs Ser Gi Hong (KHU), Igor Zmijarevic (CEA)

- P056** 15:50 **Transport Sweeps Using an Improved Slice Balance Approach with LDFE and GPU Acceleration**
Richard M. Vega, Marvin L. Adams
Texas A&M University
- P057** 16:15 **Development of GENESIS, a Three-dimensional Heterogeneous Transport Code based on the LEAF Method**
Akio Yamamoto, Akinori Giho, Tomohiro Endo
Nagoya University
- P059** 16:40 **The iteration and parallel strategy for the 2D/1D transport method in NECP-X**
Chen Zhao, Zhouyu Liu*, Dangwei Ma, Jun Chen, Hongchun Wu, Liangzhi Cao
Xi'an Jiaotong University
- P046** 17:05 **Accuracy and Performance of 3D MOC for Full-Core PWR Problems**
Geoffrey Gunow, Samuel Shaner, William Boyd, Benoit Forget, and Kord Smith
Massachusetts Institute of Technology

Oral Session No. 8 [OS2H-I]

Samda B (3F)

April 17 (Mon), 15:50-17:30

MC Methods General I

Chairs Erin Fichtl (LANL), Sedat Goluoglu (Florida)

- P162** 15:50 **MCNP-6 Kinetics Simulation of Fast Periodic Pulsed Reactors**
Z. Zhong¹, Y. Gohar¹, A. Talamo¹, Y. Cao¹, I. Bolshinsky², Yu. N. Pepelyshev³, Alexander Vinogradov³
¹*Argonne National Laboratory*
²*Idaho National Laboratory*
³*Joint Institute for Nuclear Research*
- P164** 16:15 **Generalised Boltzmann Fokker-Planck Elastic Scattering using the Evaluated Electron Data Library**
Daniel M. Fletcher¹, Brian C. Franke²
¹*AWE Plc.*
²*Sandia National Laboratories*
- P165** 16:40 **Macroscopic Data Generation for Full-Core VVER Reactor Calculations by Serpent**
Jan Frybort^{1,2}, Radim Vocka¹
¹*Czech Technical University In Prague*
²*UJV Rez*
- P166** 17:05 **Improving the Convergence of the Iterative Implicit Monte Carlo Method of Thermal Radiation Transport**
N. A. Gentile¹, Simon Bolding², and Ben C. Yee³
¹*Lawrence Livermore National Laboratory*
²*Texas A&M University*
³*University of Michigan*

Oral Session No. 9 [OS11A]

402 A (4F)

April 17 (Mon), 15:50-17:30

Fusion Plasma Theory

Chairs Yong Su Na (SNU), Haruki Seto (QST)

- P381** 15:50 Gyro-kinetic Study of Rosenbluth-Hinton Flow for Fusion Reactor Plasmas
Kyeong Pyo Lee and T. S. Hahm*
Seoul National University
- P382** 16:15 Benchmark of an electromagnetic gyrokinetic simulation code
K. Miki¹, N. Miyato¹, B. Scott², and M. Yagi¹
¹*National Institute for Quantum and Radiological Science*
²*Max-Planck-Institut für Plasmaphysik*
- P383** 16:40 Gyrokinetic simulations of electrostatic microinstabilities and turbulence with bounce-averaged kinetic electrons for shaped tokamak plasmas¹
Lei Qi¹, Jaemin Kwon¹, T.S. Hahm^{1,2}, Sumin Yi¹
¹*National Fusion Research Institute*
²*Seoul National University*
- P384** 17:05 Validation Study On Upwinding Schemes For Core MHD/Turbulent Simulation
Haruki Seto, Masatoshi Yagi
National Institutes for Quantum and Radiological Science and Technology

Oral Session No.10 [OS10A]

402 B (4F)

April 17 (Mon), 15:50-17:30

Multiscale Material Modeling

Chairs Mark Gilbert (UKAEA), Kunok Chang (KAERI)

- P370** 15:50 Behavior of Mn-Ni-Si rich precipitate in RPV steel: Linking CALPHAD to phase-field method
Kunok Chang, Gyeong-Geun Lee, Junhyun Kwon
Korea Atomic Energy Research Institute
- P371** 16:15 Heat Source Characterization In A TREAT Fuel Particle Using Coupled Neutronics Binary Collision Monte-Carlo Calculations
Sebastian Schunert¹, Daniel Schwen¹, Pedram Ghassemi², Benjamin Baker¹, Adam Zabriskie¹, Javier Ortensi¹, Yaqi Wang¹, Frederick Gleicher¹, Mark DeHart¹, Richard Martineau¹
¹*Idaho National Laboratory*
²*North Carolina State University*
- P374** 16:40 Evaluation of Threshold Displacement Energy of Tungsten by Molecular Dynamics Simulation
Mosab Jaser Banisalman, Sehyeok Park, Takuji Oda
Seoul National University
- P372** 17:05 Validation of SuperMC in Producing the Activation Data Handbook for ITER
Nana Bao, Shengpeng Yu, Qi Yang, Jing Song*, Pengcheng Long
Institute of Nuclear Energy Safety Technology

Oral Session No.11 [OS8A]

301 (3F)

April 17 (Mon), 15:50-17:30

Subchannel Analysis

Chairs Suneet Singh (IITB), Dmitry Oleksyuk (Kurchatov)

- P338** 15:50 Extension of the Component Thermal-Hydraulics Analysis code CUPID toward Subchannel Scale Analysis of Rod Bundle Geometry under Isothermal Single and Two-phase Conditions
Seok-Jong Yoon, Goon-Cherl Park and Hyoung-Kyu Cho*
Seoul National University
- P339** 16:15 Validation of the SC-INT code using experimental data on coolant mixing in a 37-rod fuel assembly with heat exchange intensifying spacer grids
D.R. Kireeva, D.A. Oleksyuk
NRC 'Kurchatov Institute'
- P340** 16:40 Solution Verification of CTF and CTF-R Using Isokinetic Advection Test Problems
Nathan Porter¹, Maria Avramova¹, Vincent Mousseau²
¹*North Carolina State University*
²*Sandia National Laboratories*
- P336** 17:05 Development of whole CORE Thermal Hydraulic analysis code CORTH
Pan JunJie, Tang QiFen, Chai XiaoMing, Lu Wei, Liu Dong
Nuclear Power Institute of China

Oral Session No.12 [OS6G-I]

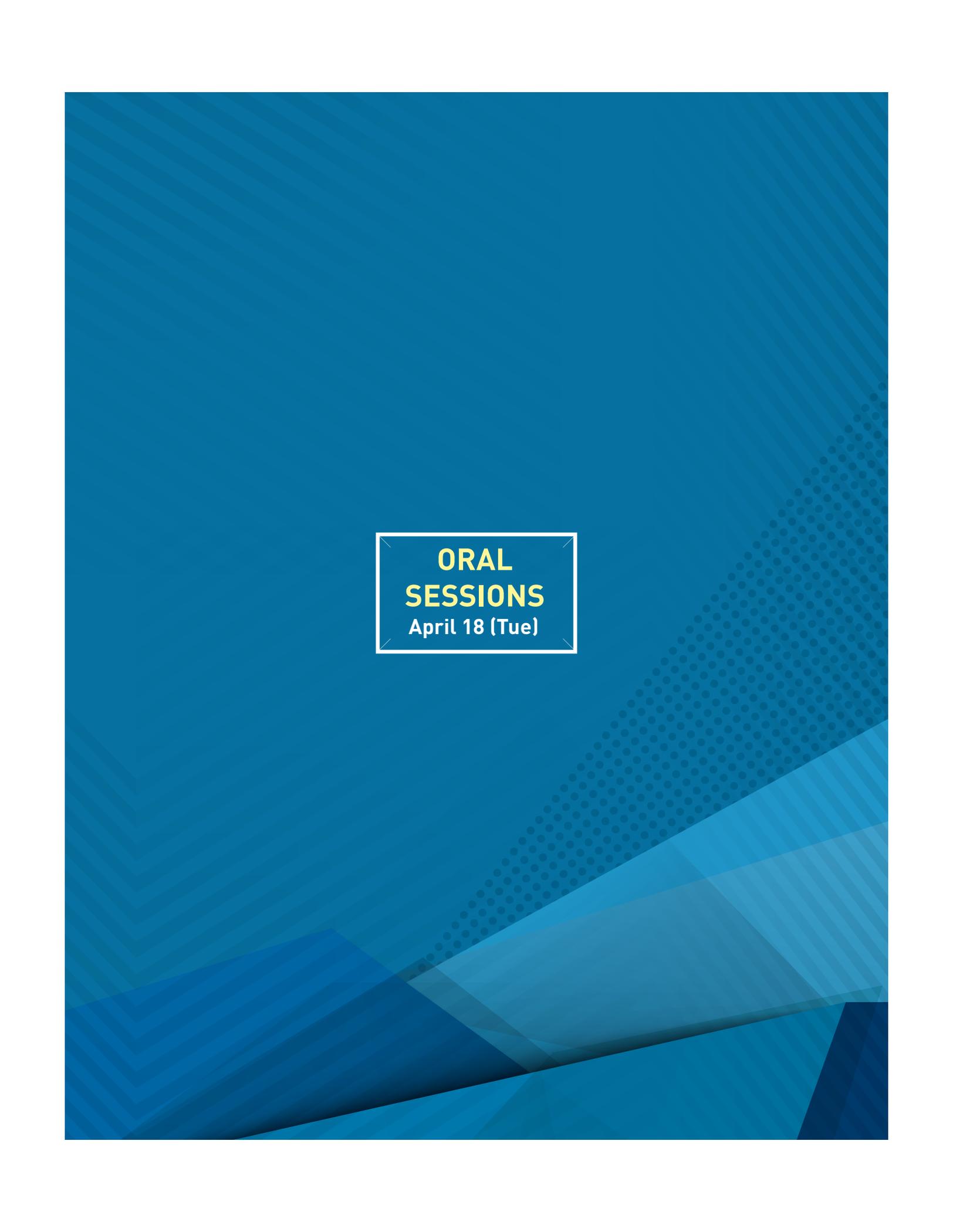
302 (3F)

April 17 (Mon), 15:50-17:30

Reactor Codes and Applications I

Chairs Kostadin Ivanov (NCSU), Jin Young Cho (KAERI)

- P311** 15:50 Fixed-Source and Ex-Core Detector Calculations with SIMULATE5
Tamer Bahadir¹, Matthew M. Giffen², Christopher Wells²
¹*Studsvisk Scandpower, Inc.*
²*Dominion Generation*
- P312** 16:15 Calculation of non-fundamental Modes in TRIVAC5 with SLEPc
A. Bernal¹, A. Hébert², J.E. Roman³, R. Miró¹ and G. Verdú¹
¹*Universitat Politècnica de València*
²*École Polytechnique de Montréal*
³*Universitat Politècnica de València*
- P313** 16:40 Analyses Supporting Design Review of TREAT Multi-SERTTA Experiment Test Vehicle
John D. Bess, Connie M. Hill, Nicolas E. Woolstenhulme, Colby B. Jensen
Idaho National Laboratory
- P316** 17:05 A Reduced-Basis Element Method for Pin-by-Pin Reactor Core Calculations
Alexey L. Cherezov, Han G. Joo
Seoul National University

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**ORAL
SESSIONS**
April 18 (Tue)

Oral Session No.13 [OS1I-I]

Samda A (3F)

April 18 (Tue), 08:30-10:10

Stochastic Behavior and Transport I

Chairs Brian Franke (SNL), Richard Sanchez (SNU)

- P067** 08:30 The Levermore-Pomraning and Atomic Mix Closures for n-ary Stochastic Materials
Shawn D. Pautz and Brian C. Franke
Sandia National Laboratories
- P060** 08:55 Beyond Levermore-Pomraning for Implicit Monte Carlo Radiative Transfer in Binary Stochastic Media
Patrick S. Brantley, N. A. Gentile, George B. Zimmerman
Lawrence Livermore National Laboratory
- P070** 09:20 Benchmark solutions for transport in d -dimensional Markov binary mixtures
Coline Larmier, François-Xavier Hugot, Fausto Malvagi, Alain Mazzolo, Andrea Zoia
CEA
- P066** 09:45 Reduced-Order Modeling of Radiation Transport in Binary Stochastic Media
Aaron Olson¹, Anil Prinja², Brian Franke¹
¹*Sandia National Laboratories*
²*University of New Mexico*

Oral Session No.14 [OS2H-II]

Samda B (3F)

April 18 (Tue), 08:30-10:10

MC Methods General II

Chairs Thomas Sutton (KAPL), Sara Pozzi (UM)

- P167** 08:30 In-Line (α, n) Source Sampling Methodology for Monte Carlo Radiation Transport Simulations
D.P. Griesheimer, A.T. Pavlou, J.T. Thompson, J.C. Holmes, M.L. Zerkle, E. Caro, H. Joo
Naval Nuclear Laboratory
- P168** 08:55 A Rejection Sampling Based Method for Determining Thermal Scattering Angle and Energy
Carl C. Haugen, Benoit Forget, Kord S. Smith
Massachusetts Institute of Technology
- P169** 09:20 A Multigroup Interpolated Compton Scattering Treatment for the Implicit Monte Carlo Method
Kendra P. Keady*, Terry S. Haut, and Mathew A. Cleveland
Los Alamos National Laboratory
- P171** 09:45 Development of a Coupled Neutron / Photon Transport Mode in the Serpent 2 Monte Carlo Code
Jaakko Leppänen¹, Toni Kaltiaisenaho¹, Ville Valtavirta¹, Martti Metsälä²
¹*VTT Technical Research Centre of Finland, Ltd.*
²*Aalto University*

Oral Session No.15 [OS9A-I]

402 A (4F)

April 18 (Tue), 08:30-10:10

Multiphysics Coupling Methods I

Chairs Tamer Bahadir (Studsvik), Tom Downar (UM)

- P344** 08:30 Development of the high-fidelity neutronics and thermal-hydraulic coupling code NECP-X/SUBSC
Jun Chen, Liangzhi Cao, Zhouyu Liu*, Hongchun Wu, Chen Zhao, Qingming He
Xi'an Jiaotong University
- P345** 08:55 Multi-physics Numerical Model and Code Development for Fuel Rod
Jingran Fei Shengyi Si Qichang Chen
Shanghai Nuclear Engineering Research & Design Institute
- P346** 09:20 SERPENT-PATHS Coupling Program: Calculations on the RBWR
Pierre Gourbesville¹, Volkan Seker², Andrew Ward², Thomas Downar²
¹*Écoles des Mines de Nantes*
²*University of Michigan*
- P348** 09:45 A quadratic depletion coupling scheme with adaptive stepsize control in CASMO5
Joshua Hykes and Rodolfo Ferrer
Studsvik Scandpower, Inc.

Oral Session No.16 [OS12A]

402 B (4F)

April 18 (Tue), 08:30-10:10

Safeguards Sensitivity Analyses

Chairs John Mattingly (NCSSU), Imre Pazsit (CUT)

- P407** 08:30 Characterizing Non-Gaussian Features of Acid Concentrations in a Spent Fuel Dissolver Model
James J. Peltz¹ and Dan G. Cacuci²
¹*Karlsruhe Institute of Technology*
²*University of South Carolina*
- P394** 08:55 Sensitivity studies on the production of Cm isotopes in spent fuel for safeguards applications
A. Borella, A. Calleja, L. Fiorito
SCC-CEN
- P399** 09:20 Verifying Safeguards Declarations with INDEPTH: A Sensitivity Study
Brandon R. Grogan¹, Scott M. Richards²
¹*Oak Ridge National Laboratory*
²*University of Tennessee*
- P409** 09:45 An Evaluation of Systematic Biases of the Point Kinetics Model for Active Interrogation of Uranium¹
Matthew C. Tweardy¹, Seth McConchie², Jason P. Hayward^{1,2}
¹*The University of Tennessee*
²*Oak Ridge National Laboratory*

Oral Session No.17 [OS7A]

301 (3F)

April 18 (Tue), 08:30-10:10

CFD Applications

Chairs Gong Hee Lee (KINS), Han Zhang (KIT)

- P332** 08:30 Verification and Validation of CFD Simulations involving Twin Jets using Steady RANS in Star-CCM+
L. B. Carasik & Y. A. Hassan
Texas A&M University
- P330** 08:55 Evaluating the Practicability of Multiphase CFD for BWR Fuel Assembly Analysis
Su-Jong Yoon^{1,*}, Giulia Agostinelli² and Emilio Baglietto²
¹*Idaho National Laboratory*
²*Massachusetts Institute of Technology*
- P329** 09:20 Multiscale simulation of Light Water reactor thermalhydraulics
D. Bestion
CEA
- P341** 09:45 Development and Assessment of CTF for Pin-Resolved BWR Modeling
R. Salko¹, A. Wysocki¹, B. Collins¹, M. Avramova², and C. Gosdin³
¹*Oak Ridge National Laboratory*
²*North Carolina State University*
³*The Pennsylvania State University*

Oral Session No.18 [OS6B-I]

302 (3F)

April 18 (Tue), 08:30-10:10

Reactor Transient Analysis I

Chairs Akio Yamamoto (Nagoya), Scott Palmtag (CP)

- P266** 08:30 Introduction of a Hybrid Deterministic / Stochastic Calculation Model for Transient Analysis
Alexander Aures^{1,2}, Andreas Pautz², Kiril Velkov¹, Winfried Zwermann¹
¹*Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH*
²*École polytechnique fédérale de Lausanne*
- P268** 08:55 A Stability Analysis Of The IBR-2M Pulsed Reactor Of Periodic Operation At Self-Regulating Regime
Pepelyshev Yu.N.¹, Popov A.K.¹, Sumkhuu D.^{1,2}
¹*Joint Institute for Nuclear Research*
²*Mongolian Academy of Sciences*
- P269** 09:20 HTR-10 Multiphysics Point Kinetics Benchmark
B. Ganapol
University of Arizona
M. DeHart, F. Gleicher, J. Ortensi, S. Schunert and R. Martineau
Idaho National Laboratory
- P270** 09:45 C5G7-TD Benchmark for Time-Dependent Heterogeneous Neutron Transport Calculations
Jason Hou, Kostadin Ivanov¹, Victor Boyarinov and Peter Fomichenko²
¹*North Carolina State University*
²*National Research Centre "Kurchatov Institute"*

Oral Session No.19 [OS11-II]

Samda A (3F)

April 18 (Tue), 10:30-12:10

Stochastic Behavior and Transport II

Chairs Richard Sanchez (SNU), Brian Franke (SNL)

- P061** 10:30 Nonclassical Particle Transport in Heterogeneous Materials
Thomas Camminady¹, Martin Frank¹ and Edward W. Larsen²
¹*RWTH Aachen University*
²*University of Michigan*
- P065** 10:55 Fractional Diffusion Limit of Non-Classical Transport
Martin Frank¹, and Weiran Sun²
¹*RWTH Aachen University*
²*Simon Fraser University*
- P020** 11:20 The Equivalence of "Forward" and "Backward" Nonclassical Particle Transport Theories
Edward W. Larsen¹, Martin Frank², and Thomas Camminady²
¹*University of Michigan*
²*RWTH Aachen University*
- P069** 11:45 Simplified P_N Equations for Nonclassical Transport with Isotropic Scattering
R. Vasques, R.N. Slaybaugh
University of California

Oral Session No.20 [OS2F-I]

Samda B (3F)

April 18 (Tue), 10:30-12:10

Uncertainty Propagation in MC I

Chairs Yasunobu Nagaya (JAEA), Jonathan Walsh (LLNL)

- P133** 10:30 New Approaches and Applications for Monte Carlo Perturbation Theory
Manuele Aufiero^{1,*}, Adrien Bidaud², Dan Kotlyar³, Jaakko Leppänen⁴, Giuseppe Palmiotti⁵, Massimo Salvatores⁵, Sonat Sen⁵, Eugene Shwageraus⁶, Massimiliano Fratoni¹
¹*University of California*
²*LPSC*
³*Georgia Institute of Technology*,
⁴*VTT Technical Research Centre of Finland Ltd.*
⁵*Idaho National Laboratory*
⁶*University of Cambridge*
- P134** 10:55 Continuous-energy perturbation calculations using Taylor series expansion in the MORET code
Alexis Jinaphanh, Nicolas Leclaire
Institut de Radioprotection et de sûreté nucléaire
- P135** 11:20 Monte Carlo Sensitivity and Uncertainty Analysis with Continuous-Energy Covariance Data
Dong Hyuk Lee, Hyung Jin Shim*, and Chang Hyo Kim
Seoul National University
- P176** 11:45 Monte Carlo Application ToolKit (MCATK): Advances for 2017
Travis J. Trahan, Terry R. Adams, Rob T. Aulwes, Steven D. Nolen, Jeremy E. Sweezy, Chris J. Werner
Los Alamos National Laboratory

Oral Session No.21 [OS9A-II]

402A (4F)

April 18 (Tue), 10:30-12:10

Multiphysics Coupling Methods II

Chairs Sebastian Schunert (INL), Jin Young Cho (KAERI)

- P349** 10:30 A First Finite Element Solver Shared by Neutron Diffusion, Heat Transfer and Mechanics
Cyril Patricot¹, Grégoire Allaire², Olivier Fandeur³
¹CEA, ²CMAP, ³CEA
- P350** 10:55 Multiphysics Core Dynamics Simulation Using the Improved Quasi-Static Method
Zachary M. Prince, Jean C. Ragusa
Texas A&M University
- P352** 11:20 Self-Regulating Broyden Sequences For Solving Non-linear Equations In The GALILEO™ Fuel Rod Code
R. van Geemert¹, C. Garnier²
¹AREVA GmbH, ²AREVA NP
- P354** 11:45 A Comparison of Coupling Algorithms for N/TH Transient Problems in HTR
ZHANG Han^{1,2}, GUO jiong¹, LU jianan¹, NIU jinlina, LI fu¹
¹Tsinghua University
²Karlsruhe Institute of Technology

Oral Session No.22 [OS2E]

402 B (4F)

April 18 (Tue), 10:30-12:10

MC Burnup Analysis

Chairs Jaakko Leppänen (VTT), Daniel Kelly (KAPL)

- P126** 10:30 A Deterministic against Monte-Carlo Depletion Calculation Benchmark for JHR Core Configurations
A. Chambon, P. Vinai, C. Demazière
Chalmers University of Technology
L. Gaubert, J. Politello, F. Jeury
CEA
- P129** 10:55 Stable perturbation-based substep method for coupled Monte Carlo Codes
Dan Kotlyar¹, Manuele Auffero², Eugene Shwageraus³, Massimiliano Fratoni²
¹Georgia Institute of Technology
²University of California
³University of Cambridge
- P130** 11:20 PHENIX: Interpretation of ECRIX-H transmutation experiment with TRIPOLI4D®
V. Pascal, R. Selabi, J. Tommasi
CEA
- P128** 11:45 Hybrid Depletion Method for the Light Water Reactor analysis
Wonkyeong Kim¹, Hyunsuk Lee¹, Sooyoung Choi¹, Ji-Eun Jung² and Deokjung Lee¹
¹Ulsan National Institute of Science and Technology
²Korea Hydro and Nuclear Power Central Research Institute

Oral Session No.23 [OS5D-I]

301 (3F)

April 18 (Tue), 10:30-12:10

Sensitivity and Uncertainty Analysis - General I

Chairs Shawn Pautz (SNL), Choong Sup Gil (KAERI)

- P241** 10:30 Adjoint-enabled Uncertainty Quantification for Satellite Shield Designs
Brian M. Adams, Shawn D. Pautz, Laura P. Swiler, Brian C. Franke, and Ethan L. Blansett
Sandia National Laboratories
- P247** 10:55 Adjoint-Based Sensitivities for Optimization of Satellite Electron/Proton Shields
Shawn D. Pautz, Brian C. Franke, Brian M. Adams, Laura P. Swiler and Ethan L. Blansett
Sandia National Laboratories
- P242** 11:20 A Nonintrusive POD Approach for High Dimensional Problems using Sparse Grids
F. Alsayyari, D. Lathouwers, J.L. Kloosterman
Delft University of Technology
- P243** 11:45 Treatment of Implicit Effects with XSUSA
Friederike Bostelmann^{1,2}, Andreas Pautz², Winfried Zwermann¹
¹Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
²École polytechnique fédérale de Lausanne

Oral Session No.24 [OS6B-II]

302 (3F)

April 18 (Tue), 10:30-12:10

Reactor Transient Analysis II

Chairs Scott Palmtag (CP), Akio Yamamoto (Nagoya)

- P272** 10:30 Whole-Core Pin-Resolved PWR Transient Calculations in MPACT
Brendan Kochunas, Ang Zhu, Daniel Jabaay, Yunlin Xu, Thomas Downar
University of Michigan
- P273** 10:55 SIMMER Extension for Multigroup Energy Structure Search using Genetic Algorithm
M. Massone, F. Gabrielli, A. Rineiski
Karlsruhe Institute of Technology
- P287** 11:20 Computational Analysis of TAPIRO Experiments by the SERPENT and ERANOS Codes
O. Dicuonzo¹, V. Fabrizio², D. Caron¹, S. Dulla¹, M. Carta², P. Ravetto¹
¹Politecnico di Torino
²ENEA
- P288** 11:45 Evaluation of neutron spectrum for pin-by-pin MA transmutation analysis by reconstruction of neutron flux distribution
Satoshi Takeda, Takanori Kitada
Osaka University

Oral Session No.25 [OS1A-I]

Samda A (3F)

April 18 (Tue), 13:20-15:25

Whole Core Modeling without T/H I

Chairs Mohamed Ouisloumen (WH), Deokjung Lee (UNIST)

- P002** 13:20 Macroscopic Cross Section Generation with SCALE 6.2 for the MYRRHA Minimal Critical Core
Jeremy Bousquet, Friederike Bostelmann, Kiril Velkov, Winfried Zwermann
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
- P003** 13:45 Developments of the sodium fast reactor analysis code SARAX: methods and verification
Xianan Du, Liangzhi Cao, Youqi Zheng*, Hongchun Wu
Xi'an Jiaotong University
- P004** 14:10 Critical Computation with Finite Element Method on Non-Conforming Meshes¹
Léandre Giret¹, Patrick Ciarlet², Erell Jamelot¹
¹CEA-Saclay, ²ENSTA Paristech
- P005** 14:35 Progress in Characterizing 2D/1D Accuracy in MPACT
Michael Jarrett, Brendan Kochunas, Edward Larsen, Thomas Downar
University of Michigan
- P006** 15:00 Initial BWR Modeling Capability for MPACT
Brendan Kochunas¹, Daniel Jabaay¹, Andrew Fitzgerald¹, Thomas J. Downar¹, Scott Palmtag²
¹University of Michigan, ²Core Physics Inc.

Oral Session No.26 [OS2A-II]

Samda B (3F)

April 18 (Tue), 13:20-15:25

MC with T/H Feedback II

Chairs Kan Wang (Tsinghua), David Griesheimer (NNL)

- P087** 13:20 Preliminary Simulation Results of BEAVRS Three-dimensional Cycle 1 Wholecore Depletion by UNIST Monte Carlo Code MCS
Hyunsuk Lee¹, Wonkyeong Kim¹, Peng Zhang¹, Azamat Khassenov¹, Jinsu Park¹, Jiankai Yu¹, Sooyoung Choi¹, Hwan Soo Lee² and Deokjung Lee^{1*}
¹Ulsan National Institute of Science and Technology
²KHNP-CRI
- P088** 13:45 Monte Carlo / Thermal-Fluids Coupled Calculations for MHTGR-350MW Benchmark
Matthieu Lemaire¹, Hyunsuk Lee¹, Nam-il Tak², Hyun-Chul Lee³, Deokjung Lee^{1*}
¹Ulsan National Institute of Science and Technology
²Korea Atomic Energy Research Institute
³Pusan National University
- P089** 14:10 RMC Capability of Multi-cycle HFP Full Core Burnup Simulation
Shichang Liu¹, Gang Wang¹, Jingang Liang², Feng Yang¹, Zonghuan Chen¹, Xiaoyu Guo¹, Qu Wu¹, JuanJuan Guo¹, Yishu Qiu¹, Xiao Tang¹, Zeguang Li³, Kan Wang¹
¹Tsinghua University
²Massachusetts Institute of Technology
³Tsinghua University
- P083** 14:35 A Versatile Method of Coupled Neutronics/Thermal-hydraulics Based on HDF5
Juanjuan Guo, Shichang Liu, Qicang Shen, Shanfang Huang, Kan Wang
Tsinghua University
- P092** 15:00 Coupled Burnup Calculations with the Serpent 2 Monte Carlo Code
Ville Valtavirta, Jaakko Leppänen
VTT Technical Research Centre of Finland

Oral Session No.27 [OS3B]

402 A (4F)

April 18 (Tue), 13:20-15:25

Integral Experiment for Nuclear Data

Chairs Alain Santamarina (CEA), Jonathan Walsh (LLNL)

- P189** 13:20 Integral Nuclear Data Validation Using Experimental Spent Nuclear Fuel Compositions
I. C. Gauld¹, M. L. Williams¹, F. Michel-Sendis², and J. S. Martinez¹
¹Oak Ridge National Laboratory
²OECD Nuclear Energy Agency
- P191** 13:45 Nuclear Data and Code Testing Using the Radiation Shielding Experiments in SINBAD
Ivan Kodeli
Jožef Stefan Institute
- P192** 14:10 Impact of Perturbed H₂O Thermal Scattering Data in OPAL Reactor Calculations
Lance Maul
Australian Nuclear Science and Technology Organisation
- P193** 14:35 Re-Estimation of Nuclear Data and Reliable Covariances using Integral Experiments. Application to JEFF3 Library
A. Santamarina, D. Bernard
CEA
- P194** 15:00 Re-evaluation of the ¹⁵⁴Eu thermal capture cross-section based on spent fuel benchmarking studies
Steven E. Skutnik
University of Tennessee-Knoxville

Oral Session No.28 [OS2D]

402 B (4F)

April 18 (Tue), 13:20-15:25

MC Convergence Acceleration

Chairs Taro Ueki (JAEA), Min Jae Lee (KAERI)

- P120** 13:20 Monte Carlo Fission Source Convergence with Nearest-Neighbor Estimates of the Differential Entropy
Brian C. Kiedrowski, Kyle A. Beyer
University of Michigan
- P121** 13:45 Accelerating Source Convergence in Monte Carlo Criticality Calculations Using a Particle Ramp-up Technique
Amanda L. Lund, Paul K. Romano, Andrew R. Siegel
Argonne National Laboratory
- P122** 14:10 Accelerating The Monte-Carlo Power Iteration Utilizing The Jacobian-Free Newton Krylov Methodology
Antonios G. Mylonakis^{1,2}, Melpomeni Varvayanni¹, Nicolas Catsaros¹
¹National Centre for Scientific Research Demokritos
²Aristotle University of Thessaloniki
- P123** 14:35 Estimation of the Effective Multiplication Factor by Monte-Carlo Method Using the Importance Function
M.I. Gurevich, M.A. Kalugin, D.S. Oleynik, D.A. Shkarovsky
National Research Center Kurchatov Institute
- P124** 15:00 Spectral Analysis for Convergence Assessment in Monte Carlo Criticality Calculation
Taro Ueki
Japan Atomic Energy Agency

Oral Session No.29 [OS5A-II]

301 (3F)

April 18 (Tue), 13:20-15:25

Uncertainty Quantification in Multiphysics II

Chairs Thomas Fanning (ANL), Soon Sam Kim (LLNL)

- P217** 13:20 Quantifying Uncertainty in the BEAVRS Benchmark
Jingang Liang, Shikhar Kumar, Benoit Forget, Kord Smith
Massachusetts Institute of Technology
- P221** 13:45 Two-Step Uncertainty Analysis of Watts Bar Nuclear 1 Cycle 1 with SCALE/PARCS¹
Kevin Xu¹, Matthew A. Jessee², Andrew Ward¹, Thomas Downar¹
¹University of Michigan
²Oak Ridge National Laboratory
- P222** 14:10 Uncertainty Analysis of Light Water Reactor Core Simulations Using Statistic Sampling Method
Kaiyue Zeng¹, Jason Hou¹, Kostadin Ivanov¹, Matthew A. Jessee²
¹North Carolina State University
²Oak Ridge National Laboratory
- P223** 14:35 Dakota-SAS4A/SASSYS-1 Coupling for Uncertainty Quantification and Optimization Analysis
Guanheng Zhang, Acacia J. Brunett, Tyler Sumner, Nicolas Stauff, Thomas Fanning
Argonne National Laboratory
- P236** 15:00 Nuclear Data Uncertainty Decomposition for SPERT-III RIA Experiments using SIMULATE-3K and SHARK-X
A. Dokhane¹, G. Grandi², O. Leray¹, D. Rochman¹, A. Vasiliev¹, H. Ferroukhi¹
¹Paul Scherrer Institut, ²Studsvik Scandpower, Inc.

Oral Session No.30 [OS6C-II]

302 (3F)

April 18 (Tue), 13:20-15:25

Cycle Methods and Optimization II

Chairs Hyun Chul Lee (PNU), David Kropaczek (NCSU)

- P282** 13:20 Implementation of a CRAM solver in MENDEL Depletion Code System
Sebastien Lahaye¹, Aime Tsilanizara¹, Pierre Bellier¹, Thomas Bittar²
¹CEA, ²Ecole Centrale de Lyon
- P283** 13:45 Latest Developments in the ARTEMIS™ Core Simulator for BWR Steady-state and Transient Methodologies
Nicolas Martin¹, Michael Riedmann², Jérôme Bigot³
¹AREVA Inc., ²AREVA GmbH, ³AREVA NP
- P284** 14:10 Design of a load-following management for a PWR reactor using an optimization method
Mathieu Muniglia¹, Jean-Charles Le Pallec¹, Jean-Michel Do¹, Sébastien Verel²
¹Commissariat à l'Energie Atomique
²Univ. du Littoral Côte d'Opale
- P285** 14:35 An Optimized Search Algorithm for Charged Fuel Enrichment in Fixed-Source Equilibrium Cycle Analysis of REBUS-3
Tongkyu Park^{1,2} and Won Sik Yang¹
¹Purdue University, ²FNC Technology
- P286** 15:00 Bowing effects on power and burn-up distributions for simplified full PWR and BWR cores
D. Rochman¹, P. Mala¹, H. Ferroukhi¹, A. Vasiliev¹, M. Seidl², D. Janin² and J. Li³
¹Paul Scherrer Institut, ²Preussen Elektra GmbH
³The University of Tokyo

Oral Session No.31 [OS1A-II]

Samda A (3F)

April 18 (Tue), 15:50-17:30

Whole Core Modeling without T/H II

Chairs Deokjung Lee (UNIST), Mohamed Ouisloumen (WH)

- P007** 15:50 "Nonlocal" Diffusion Coefficients for Neutronic Systems Containing Voided Subregions
Edward W. Larsen¹, Jim E. Morel², Jijie Lou²
¹University of Michigan
²Texas A&M University
- P008** 16:15 Developments within the WIMS Reactor Physics Code for Whole Core Calculations
Ben Lindley¹, Glynn Hosking¹, Peter Smith¹, David Powney¹, Brendan Tollit¹, Tim Fry¹, Ray Perry¹, Tim Ware¹, Christophe Murphy¹, Chris Grove², Mike Thomas², Kevin Hesketh², Dan Kotlyar³
¹Amec Foster Wheeler
²The UK's National Nuclear Laboratory
³Georgia Institute of Technology
- P011** 16:40 Time-dependent S_n method in the DOMINO solver of the Cocagne platform
Ansar Calloo, Angélique Ponçot and David Couyras
EDF R&D
- P014** 17:05 Direct Neutronics Modeling Approach for Deformed Core Analysis using PROTEUS
E. R. Shemon, M. A. Smith, C. H. Lee, T. K. Kim, and T. H. Fanning
Argonne National Laboratory

Oral Session No.32 [OS2C-I]

Samda B (3F)

April 18 (Tue), 15:50-17:30

Variance Reduction and Hybrids I

Chairs John Wagner (INL), Ding She (Tsinghua)

- P101** 15:50 Fusion Energy Systems Analysis with the Groupwise Transmutation CADIS Method
Elliott D. Biondo¹ and Paul P.H. Wilson²
¹Oak Ridge National Laboratory
²University of Wisconsin
- P102** 16:15 Residual Monte Carlo Transport in Time with Consistent Low-Order Acceleration for 1D Thermal Radiative Transfer
Simon R. Bolding¹, Jim E. Morel²
¹Los Alamos National Laboratory
²Texas A&M University
- P104** 16:40 Analysis of Inconsistent Source Sampling in Monte Carlo Weight-Window Variance Reduction Methods
David P. Griesheimer, Virinder S. Sandhu
Naval Nuclear Laboratory
- P105** 17:05 Real-Time SNF Cask External Dose Calculation Using RAPID
Meng-Jen Wang, Valerio Mascolino, Alireza Haghghat, and Nathan J. Roskoff
Virginia Tech

Oral Session No.33 [OS11B]

402 A (4F)

April 18 (Tue), 15:50-17:30

Fusion Plasma Simulation

Chairs Haruki Seto (QST), Yong Su Na (SNU)

- P388** 15:50 Parallelization of Spectral Landau Fluid Code Using MPI
Masatoshi Yagi¹, YoungWoo Cho², Haruki Seto¹,
Taik Soo Hahm²
¹National Institutes for Quantum and Radiological Science
and Technology
²Seoul National University
- P389** 16:15 Improved Correlated Sampling For Iteratively Coupled
PDE/Monte-Carlo Methods Used In Plasma Edge Simulations
M. Baeten, B. Mortier, M. Baelmans, G. Samaey
KU Leuven
- P390** 16:40 Numerical error estimation in Random Noise coupled
plasma edge simulations in nuclear fusion reactors
K. Ghoos, G. Samaey, M. Baelmans
KU Leuven
- P380** 17:05 Effect of pressure gradient in the connection region on
the stability of edge pedestal
S. K. Kim¹, Y. S. Na¹ and O. J. Kwon²
¹Seoul National University
²Daegu University

Oral Session No.34 [OS2G-I]

402 B (4F)

April 18 (Tue), 15:50-17:30

MC Applications I

Chairs Brian Kiedrowski (UM), Jiankai Yu (UNIST)

- P145** 15:50 Reactor Core Simulations for Determination of the
Antineutrino Spectrum for the SoLid Experiment at BR2
Reactor
Silva Kalcheva, Geert Van den Branden, Vadim Kuzminov
and Edgar Koonen
SCK•CEN
Lydie Giot and Muriel Fallot
SUBATECH
- P147** 16:15 Equation Section (Next) Adaptive Tally Bin Structure for
Problem Analysis and Surface Source Sampling
David Legrady, Zoltan Boroczki, Ildiko Papp
Budapest University of Technology
- P151** 16:40 A simulation model for free surface oscillations effects on
power stability of the Aqueous Homogeneous Reactor
Shuai Wang , Yingrui Yu , Liangzi Wang , Xue Qin,
Zhumin Jiang
Nuclear Power Institute of China
- P149** 17:05 Investigating Diffusion Coefficient Anisotropy in Axially
Heterogeneous High Conversion Water Reactors
Eugene Shwageraus, Nathaniel Read
University of Cambridge,

Oral Session No.35 [OS5A-III]

301 (3F)

April 18 (Tue), 15:50-17:30

Uncertainty Quantification in Multiphysics III

Chairs Soon Sam Kim (LLNL), Hyun-Kyung Chung (IAEA)

- P214** 15:50 Uncertainty assessment for calculated atomic, molecular
and nuclear data for fusion and nuclear applications
Hyun-Kyung Chung, Bastiaan J. Braams, Roberto Capote
and Arjan J. Koning
International Atomic Energy Agency
- P224** 16:15 Uncertainty Analysis of Thermal-Hydraulic in Simulation
of AP1000 Steam Generator
Xiaoyu Zhang, Zhaofei Tian, Gangping Shang
Fundamental Science on Nuclear Safety and Simulation
Technology Laboratory
- P239** 16:40 A New Breakdown Methodology to Estimate Neutronic
Model Biases Applied to APOLLO3® SFR Core Calculations
V. Jouault, J.-M. Palau, G. Rimpault, J.-F. Vidal
CEA
- P182** 17:05 Surrogate Based Data Assimilation for Pressurized Water
Reactors
Bassam A. Khuwaileh and Paul J. Turinsky
North Carolina State University

Oral Session No.36 [OS6A-I]

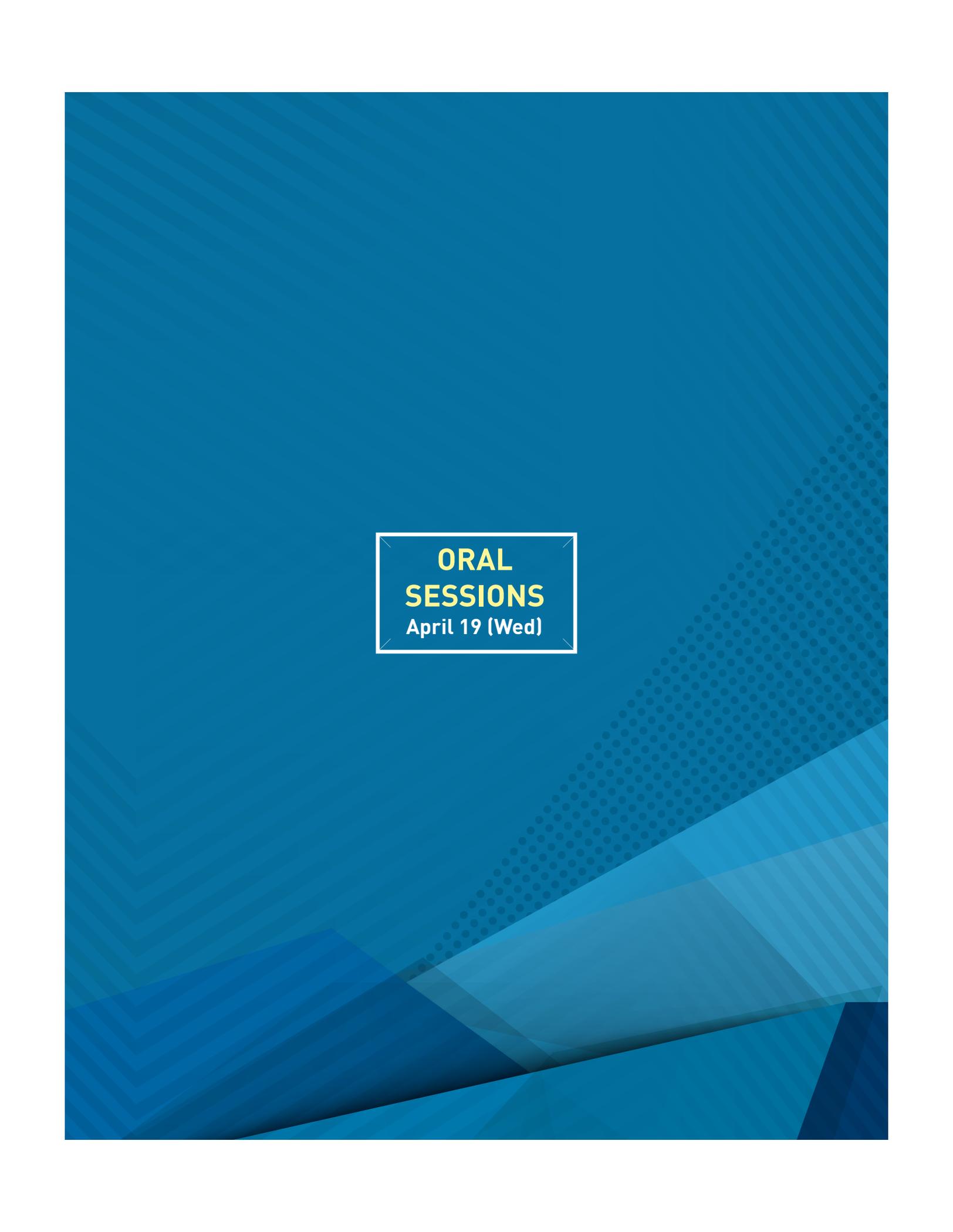
302 (3F)

April 18 (Tue), 15:50-17:30

Validation with Core Benchmarks I

Chairs Benjamin Collins (ORNL), Rodolfo Ferrer (Studsvik)

- P259** 15:50 Integral Experiments with Teflon and ⁷LiF-BeF₂ Salt at
LR-0 Reactor
Evžen Losa¹, Michal Košťál¹, Jeffrey J. Powers²,
Nicholas R. Brown^{2,3}, Donald E. Mueller²
¹Research Centre Rez
²Oak Ridge National Laboratory
³The Pennsylvania State University
- P261** 16:15 Calculation of TREAT Minimum Critical and M8CAL Core
Benchmarks with SERPENT
Volkan Seker, Matt Neumann, Hunter Smith,
Thomas Downar
University of Michigan
- P263** 16:40 Comprehensive solution of the „MIDICORE“ VVER-1000
Core Periphery Power Distribution Benchmark
by the KARATÉ and MCNP code system
E. Temesvári, Gy. Hegyi, G. Hordósy, A. Keresztúri,
Cs. Maráczy, I. Panka
Centre for Energy Research
- P264** 17:05 The Verification of Depletion Capabilities in RMC and
APOLLO2/COCAGNE Based on KAIST 1A Benchmark
Yuan Yuan¹, Xiao Tang¹, Jingang Liang²,
Xiaotong Shang¹, Kan Wang¹
¹Tsinghua University
²Massachusetts Institute of Technology

The background is a solid blue color with various geometric patterns. On the left, there are diagonal lines forming a chevron pattern. On the right, there is a halftone dot pattern that fades out. At the bottom, there are overlapping, semi-transparent geometric shapes in different shades of blue.

**ORAL
SESSIONS**
April 19 (Wed)

Oral Session No.37 [OS1A-III]

Samda A (3F)

April 19 (Wed), 08:30-10:10

Whole Core Modeling without T/H III

Chairs Mohamed Ouisloumen (WH), Deokjung Lee (UNIST)

- P010** 08:30 Nodal and Pin-by-pin Calculations Comparison with Codes SIMULATE-5 and DYN3D
P. Mala^{1,2}, A. Pautz^{1,2}, S. Canepa¹, H. Ferroukhi¹
¹Paul Scherrer Institute
²Ecole Polytechnique Federale de Lausanne
- P026** 08:55 Development and verification of a SP3 code using semi-analytic nodal method for pin-by-pin calculation
Chuntao Tang
Shanghai Nuclear Engineering Research and Design Institute
- P019** 09:20 Verification of the 2D/1D Coupling 3D Transport Code TIGER with C5G7 Benchmarks
Wenbin Wu¹, Qing Li¹, Kan Wang²
¹Nuclear Power Institute of China
²Tsinghua University
- P075** 09:45 MC²-3/TWODANT/DIF3D Analysis for the ZPPR-15 ¹⁰B (n, α) Reaction Rate Measurement
Min Jae Lee^{1*}, Donny Hartanto¹, Sang Ji Kim¹, and Changho Lee²
¹Korea Atomic Energy Research Institute
²Argonne National Laboratory

Oral Session No.38 [OS2C-II]

Samda B (3F)

April 19 (Wed), 08:30-10:10

Variance Reduction and Hybrids II

Chairs William Walters (PSU), Motomu Suzuki (CRIEPI)

- P108** 08:30 Performance Assessment of Cost-Optimized Variance Reduction Parameters in Radiation Shielding Scenarios
Joel A. Kulesza^{1,2}, Clell J. Solomon², Brian C. Kiedrowski¹, Edward W. Larsen¹
¹University of Michigan
²Los Alamos National Laboratory
- P109** 08:55 Development of a Variance Reduction Scheme in the Serpent 2 Monte Carlo Code
Jaakko Leppänen¹, Tuomas Viitanen¹, Olli Hyvönen²
¹VTT Technical Research Centre of Finland, Ltd.
²Aalto University
- P110** 09:20 Three-Dimensional Neutron Streaming Calculations Using Adaptive Multilevel Splitting
Henri Louvin¹, Eric Dumontel², Tony Lelièvre³
¹CEA Saclay
²IRSN
³Université Paris-Est
- P112** 09:45 Variance analysis of Woodcock type tracking
Balazs Molnar, David Legrady
Budapest University of Technology and Economics

Oral Session No.39 [OS9C]

402 A (4F)

April 19 (Wed), 08:30-10:10

Whole Core Modeling & Simulation

Chairs Shane Stimpson (ORNL), Matthieu Lemaire (UNIST)

- P362** 08:30 Analysis of the Startup of Watts Bar Nuclear Unit 2 using VERA
A. Godfrey¹, B. Collins¹, C. Gentry¹, J. Ritchie²
¹Oak Ridge National Laboratory
²Tennessee Valley Authority
- P363** 08:55 Recent Advancements in AEGIS/SCOPE2 and Its Verifications and Validations
Masahiro Tatsumi¹, Masato Tabuchi¹, Kotaro Sato¹, Yasuhiro Kodama², Yasunori Ohoka², Hiroaki Nagano²
¹Nuclear Engineering, Ltd.
²Nuclear Fuel Industries, Ltd.
- P356** 09:20 The Process of Asymmetric Boron Dilution at Zero Power of VVER-1000 on Kudankulam NPP and its Simulation
S.V. Tsyganov, A.V. Kotsarev, A.V. Baykov
NRC "Kurchatov Institute"
- P366** 09:45 Jacobian-Free Newton-Krylov Coupling Methods for Nuclear Reactors
Erik D. Walker¹, Benjamin Collins², and Jess C. Gehin²
¹University of Tennessee
²Oak Ridge National Laboratory

Oral Session No.40 [OS10B]

402 B (4F)

April 19 (Wed), 08:30-10:10

Computational Material Science General

Chairs Kunok Chang (KAERI), Mark Gilbert (UKAEA)

- P376** 08:30 Automated Inventory and Material Science Scoping Calculations under Fission and Fusion Conditions
Mark R. Gilbert, M. Fleming and J.-Ch. Sublet
United Kingdom Atomic Energy Authority
- P377** 08:55 Kriging-based surrogate models for sensitivity analysis, uncertainty quantification and parameter calibration of the fuel performance code BISON
Tat Nghia Nguyen, Thomas Downar
University of Michigan
- P378** 09:20 Analysis on Thermal Conductivity Definitions for Equilibrium Molecular Dynamics Simulation
Jinho Ryu, Byoungchan Han, Takuji Oda
Seoul National University
- P375** 09:45 Neural Network Approach Coupled with MCNP to Analyze Gamma Spectra for Bio-samples
Huseyin Sahiner, Xin Liu
Missouri University of Science and Technology

Oral Session No.41 [OS7B]

301 (3F)

April 19 (Wed), 08:30-10:10

CFD Methods

Chairs Han Zhang (KIT), Vasilii Volkov (OKB)

- P326** 08:30 Large Eddy Simulation of Turbulent Flows Using the CFD Code GASFLOW-MPI
Han Zhang, Jianjun Xiao, Thomas Jordan
Karlsruhe Institute of Technology
- P328** 08:55 Multiphase Turbulence Mechanisms Identification from Consistent Analysis of Direct Numerical Simulation Data
B. Magolan, E. Baglietto
Massachusetts Institute of Technology
C. Brown, I.A. Bolotnov
North Carolina State University
G. Tryggvason, J. Lu
University of Notre Dame
- P327** 09:20 CFD modeling of the 37 rod bundle experiment
V.Yu. Volkov¹, L.A. Golibrodo¹, A.A. Krutikov¹, O.V. Kudryavtsev¹, A.P. Skibin¹, L.L. Kobzar², D.A. Oleksyuk²
¹OKB "GIDROPRESS"
²National Research Center "Kurchatov institute"
- P331** 09:45 Evaluation of a Hyperbolic Conservative Mixture Model for Thermal-Hydraulics Two-Phase Flows of Nuclear Reactors
Dia Zeidan¹ and Henrik Ström²
¹German Jordanian University
²Chalmers University of Technology

Oral Session No.42 [OS6F-I]

302 (3F)

April 19 (Wed), 08:30-10:10

Stochastics Process Analysis I

Chairs Christophe Demazière (CUT), Andrea Zoia (CEA)

- P304** 08:30 Core Diagnostics Using Noise Analysis: From Proof-Of-Principle to Industrial Demonstration
Christophe Demazière
Chalmers University of Technology
- P308** 08:55 The new 3-D multigroup diffusion neutron noise solver of APOLLO3® and a theoretical discussion of fission-modes noise
Amélie Rouchon¹, Richard Sanchez^{*,2}, Igor Zmijarevic¹
¹CEA
²Seoul National University
- P305** 09:20 Theoretical Discussion of Statistical Error for Variance-to-Mean Ratio
Tomohiro Endo, Akio Yamamoto
Nagoya University
- P306** 09:45 An Overview of the Collaboration in Diagnostics and Monitoring between Ringhals NPP and Chalmers University of Technology
Henrik Nylén, Tell Andersson
Ringhals AB

Oral Session No.43 [OS1E]

Samda A (3F)

April 19 (Wed), 10:30-12:10

Radiative Transfer Methods

Chairs Clif Drumm (SNL), Jean Ragusa (TAMU)

- P037** 10:30 A Review of the Upstream Corner Balance Spatial Discretization
Peter G. Maginot¹, Paul F. Nowak¹, Marvin L. Adams²
¹Lawrence Livermore National Laboratory
²Texas A&M University
- P038** 10:55 Application of the Finite-Element-with-Discontinuous-Support Method to Thermal Radiation Transport
Andrew Till, Robert Lowrie, Christopher Fontes
Los Alamos National Laboratory
- P039** 11:20 First Collision Source in the IDT Discrete Ordinates Transport Code
Igor Zmijarevic, Daniele Sciannandrone
CEA-Saclay
- P021** 11:45 Scattering Cross Sections for Electron Transport Using Energy-Finite-Element Weighting
Clif Drumm and Ronald P. Kensek
Sandia National Laboratories

Oral Session No.44 [OS2H-III]

Samda B (3F)

April 19 (Wed), 10:30-12:10

MC Methods General III

Chairs Eugene Shwageraus (Cambridge), Ho Jin Park (KAERI)

- P172** 10:30 Progress of Cumulative Migration Method for Computing Diffusion Coefficients with OpenMC
Zhaoyuan Liu, Kord Smith, Benoit Forget
Massachusetts Institute of Technology
- P174** 10:55 Recent Developments to MONK for Criticality Safety and Burn-up Credit Applications
Simon Richards, Max Shepherd, Adam Bird, David Long, Christophe Murphy and Tim Fry
Amec Foster Wheeler
- P175** 11:20 Neutron Clustering in Monte Carlo Iterated-Source Calculations
Thomas M. Sutton and Anudha Mittal
Naval Nuclear Laboratory
- P177** 11:45 Monte Carlo Higher Modes Calculation based on the Extension of the Noise Propagation Matrix
Peng Zhang, Hyunsuk Lee, Deokjung Lee
Ulsan National Institute of Science and Technology

Oral Session No.45 [OS8B]

402A (4F)

April 19 (Wed), 10:30-12:10

Computational T/H - General

Chairs Dmitry Oleksyuk (Kurchatov), Suneet Singh (IITB)

- P337** 10:30 Coupling FHR Core Design with Power Conversion System
Zhiyao Xing, Eugene Shwageraus
University of Cambridge
- P342** 10:55 Confirmation of Wilks' Method with TRACE Modeling of BWR Spray Cooling
Travis Mui and Tomasz Kozlowski
University of Illinois at Urbana-Champaign
- P343** 11:20 Bifurcation Analysis of Pressure Drop Oscillations in Two-Phase Flow System Using Different Model
Md Emadur Rahman*, Munendra Pal Singh and Suneet Singh*
Indian Institute of Technology Bombay
- P334** 11:45 Investigation of Reverse Flow Restriction Device to Mitigate Fuel Dryout during BWR Loss of Coolant Accidents
Majdi I. Radaideh¹, Tomasz Kozlowski¹, Yousef M. Farawila², Travis Muia¹
¹*University of Illinois at Urbana-Champaign*
²*Farawila et al., Inc.*

Oral Session No.46 [OS12B]

402 B (4F)

April 19 (Wed), 10:30-12:10

Multiplicity Counting

Chairs James Peltz (NNSA), John Mattingly (NCSU)

- P408** 10:30 Neutron & Gamma Multiplicity Modeling at LLNL
Manoj K. Prasad
Lawrence Livermore National Laboratory
- P403** 10:55 Integral Representations for Various Fission Chain Multiplicity Distributions
William A. Noonan
Johns Hopkins University Applied Physics Laboratory
- P400** 11:20 An Extended Theory of Multiplicity Counting from Fission Chamber Signals in the Current Mode
L. Nagy^{1,2}, I. Pázsit¹, L. Pál³
¹*Chalmers University of Technology*
²*Budapest University of Technology and Economics*
³*Hungarian Academy of Sciences*
- P397** 11:45 Mathematical Analysis for Identifying Neutron Shielding in Neutron Multiplicity Counting
Guy Heger¹, Chen Dubi², Aharon Ocherashvili², Bent Pedersen³
¹*Ben Gurion University of the Negev*
²*Physics Department*
³*JRC Laboratory*

Oral Session No.47 [OS5D-II]

301 (3F)

April 19 (Wed), 10:30-12:10

Sensitivity and Uncertainty Analysis - General II

Chairs Bradley Rearden (ORNL), Don Bruss (SNL)

- P240** 10:30 COG Validation for Foils and TLDs Irradiated by Lead and Polyethylene Reflected SILENE Reactor
Soon S. Kim, David P. Heinrichs, Richard M. Buck, Edward M. Lent, and Chuck K. Lee
Nuclear Criticality Safety Division
Lawrence Livermore National Laboratory
- P246** 10:55 Differential-Operator and Correlated-Sampling Methods with Electron-Photon Transport in the Integrated TIGER Series
Brian C. Franke, Aaron Olson, Shawn D. Pautz
Sandia National Laboratories
- P244** 11:20 Adjoint-Based Uncertainty Quantification for Radiation Transport Calculations with Uncertain Cross-Section Data
Don E. Bruss¹, Jim E. Morel², Jean C. Ragusa²
¹*Sandia National Laboratories*
²*Texas A&M University*
- P248** 11:45 Investigation of Adaptive Markov Chain Monte Carlo Algorithms for Inverse Uncertainty Quantification
Xu Wu, Tomasz Kozlowski
University of Illinois at Urbana-Champaign

Oral Session No.48 [OS6D-I]

302 (3F)

April 19 (Wed), 10:30-12:10

Homogenization and Leakage Models I

Chairs Jean-Francois Vidal (CEA), Kang Seog Kim (ORNL)

- P290** 10:30 An Adapted Cross Section Collapsing Method For Few-Group SP_n Calculations
Ansar Calloo and David Couyras
EDF R&D
- P291** 10:55 Spectral Rehomonization of Nodal Cross-Sections via Proper Orthogonal Decomposition
M. Gamarino¹, A. Dall'Osso², D. Lathouwers¹, J.L. Kloosterman¹
¹*Delft University of Technology*
²*AREVA NP*
- P292** 11:20 Practical Semi-Heterogeneous Method in Nodal Core Analysis
S.A. Groenewald, R.H. Prinsloo, O.M. Zamonsky, D.I. Tomašević
Necsa
- P293** 11:45 Albedo-corrected Parameterized Equivalence Constants for Cross-section Correction in Nodal Calculation
Woosong Kim and Yonghee Kim*
Korea Advanced Institute of Science and Technology

Oral Session No.49 [OS1B]

Samda A (3F)

April 19 (Wed), 13:20-15:25

Massively Parallel Transport

Chairs Shawn Pautz (SNL), Marv Adams (TAMU)

- P016** 13:20 Use of Generalized Davidson Eigenvalue Solver for Coarse Mesh Finite Difference Acceleration
Benjamin Collins, Steven Hamilton, Shane Stimpson
Oak Ridge National Laboratory
- P017** 13:45 An Approach for Load Balancing Massively Parallel Transport Sweeps on Unstructured Grids
Tarek H. Ghaddar, Jean C. Ragusa
Texas A&M University
- P018** 14:10 Iterative Properties of Parallel Block Jacobi-Integral Transport Matrix Method with Source Iteration Preconditioning
Dylan S. Hoagland and Yousry Y. Azmy
North Carolina State University
- P033** 14:35 A Study of Various Thermal Upscattering Acceleration Schemes for Massively Parallel Transport Sweeps
Milan Hanuš¹, Jean C. Ragusa¹, Michael Hackemack²
¹*Texas A&M University*
²*Naval Nuclear Laboratory*
- P080** 15:00 Development Of A Parallel Performance Model For The THOR Neutral Particle Transport Code
Raffi Yessayan^{1,*}, Yousry Azmy¹, Sebastian Schunert²
¹*North Carolina State University*
²*Idaho National Laboratory*

Oral Session No.50 [OS2B]

Samda B (3F)

April 19 (Wed), 13:20-15:25

Next Generation Parallelism for MC

Chairs Patrick Brantley (LLNL), Sunghwan Yun (KAERI)

- P095** 13:20 LLNL Monte Carlo Transport Research Efforts for Advanced Computing Architectures
Patrick S. Brantley, Ryan C. Bleile, Shawn A. Dawson, N. A. Gentile, M. Scott McKinley, Matthew J. O'Brien, Michael M. Pozulp, David F. Richards, David E. Stevens, Jonathan A. Walsh, Hank Childs*
Lawrence Livermore National Laboratory
^{*}*University of Oregon*
- P096** 13:45 Domain Decomposed Parallel Implicit Monte Carlo with the Data Server Model
Alex R. Long
Los Alamos National Laboratory
- P097** 14:10 PATMOS: A prototype Monte Carlo transport code to test high performance architectures
Emeric Brun¹, Stéphane Chauveau², Fausto Malvagi¹
¹*CEA*, ²*Nvidia Development France*
- P098** 14:35 MPI/OpenMP Hybrid Parallelization of a Monte Carlo Neutron/Photon Transport Code MVP
Yasunobu Nagaya¹, Masaaki Adachi²
¹*Japan Atomic Energy Agency*
²*Research Organization for Information Science and Technology*
- P094** 15:00 Performance of Kernel Density Estimated Mesh Tallies on GPUs
Kerry L. Bossler
Sandia National Laboratories

Oral Session No.51 [OS3C]

402 A (4F)

April 19 (Wed), 13:20-15:25

Mathematical Methods for Nuclear Data

Chairs Luiz Leal (IRSN), Ivan Kodeli (IJS)

- P185** 13:20 A Proposal Beyond theWims Library Update Project
Alain Hébert
École Polytechnique de Montréal
- P186** 13:45 Status and Analysis of P1 Angular Scattering Sensitivity Data Available Within the Database for Icsbep (DICE)
Ian Hill, Sanggeol Jeong
Nuclear Energy Agency
- P196** 14:10 A Study of the Required Fidelity for the Representation of Angular Distributions of Elastic Scattering in the Resolved Resonance Region for Nuclear Criticality Safety Applications¹
Vladimir Sobes², Luiz Leal³, Andrej Trkov⁴ and Matt Falk⁵
²*Oak Ridge National Laboratory*
³*Institut de Radioprotection et de Sureté Nucléaire*
⁴*International Atomic Energy Agency*, ⁵*101 Two Sigma*
- P197** 14:35 Uncertainty in Fast Reactor-Relevant Critical Benchmark Simulations Due to Unresolved Resonance Structure
Jonathan A. Walsh^{1,*}, Benoit Forget², Kord S. Smith², Forrest B. Brown³
¹*Lawrence Livermore National Laboratory*
²*Massachusetts Institute of Technology*
³*Los Alamos National Laboratory*
- P198** 15:00 On the Convergence Issue for Multi-Poles Conversion from Reich-Moore Formalism
Jiankai Yu, Azamat Khassenov, Peng Zhang, Deokjung Lee*
Ulsan National Institute of Science and Technology

Oral Session No.52[OS4B]

402 B (4F)

April 19 (Wed), 13:20-15:25

ADS Analysis and Benchmarks

Chairs Tomohiro Endo (NU), Paolo Saracco (NINP)

- P203** 13:20 Some New Thoughts on the Multipoint Method for Reactor Physics Applications
Sandra Dulla¹, Piero Ravetto¹, Paolo Saracco²
¹*Politecnico di Torino*, ²*I.N.F.N.*
- P204** 13:45 Time-Dependent External Distributed Neutron Source Capability in PARCS and Comparison with TORT-TD
A. Mantout, A. Seubert, K. Velkov
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
- P205** 14:10 Calculation of the higher α -modes of the VENUS-F fast subcritical system
Máté Szieberth¹, Péter German¹, Lajos Nagy¹, József Kópházi², Danny Lathouwers³
¹*Budapest University of Technology and Economics*
²*Imperial College London*, ³*Delft University of Technology*
- P210** 14:35 Nuclear Data-Induced-Uncertainty Quantification of Neutron Multiplication Factor and Prompt Neutron Decay Constant for Pb-Bi loaded ADS Benchmark Problems at KUCA
Tomohiro Endo^{1,*}, Go Chiba², Wilfred van Rooijen³, Masao Yamanaka⁴, Cheol Ho Pyeon⁴
¹*Nagoya University*, ²*Hokkaido University*, ³*University of Fukui*, ⁴*Kyoto University*
- P211** 15:00 Benchmarks of Subcriticality in Accelerator-Driven System at Kyoto University Critical Assembly
Cheol Ho Pyeon¹, Masao Yamanaka², Song-Hyun Kim¹, Thanh-Mai Vu¹, Tomohiro Endo³, Willem Fredrik G. van Rooijen⁴ and Go Chiba⁵
¹*Kyoto University*, ²*Kyoto University*, ³*Nagoya University*, ⁴*University of Fukui*, ⁵*Hokkaido University*

Oral Session No.53 [OS6G-II]

301 (3F)

April 19 (Wed), 13:20-15:25

Reactor Codes and Applications II

Chairs Jin Young Cho (KAERI), Kostadin Ivanov (NCSU)

P318 13:20 COCAGNE: EDF new neutronic core code for ANDROMÈDE calculation chain

Ansar Calloo, David Couyras, François Févotte, Matthieu Guillo*, Coline Brosseleard, Bertrand Bouriquet, Alexandre Dubois, Enrico Girardi, Fabrice Hoareau, Marie Fliscounakis, Hadrien Leroyer, Etienne Noblat, Yann Pora, Laurent Plagne, Angélique Ponçot, Nadine Schwartz
EDF R&D

P319 13:45 FEM-based Estimation of Reactivity Change due to Core Deformation in SFR

Woong Heo and Yonghee Kim*
Korea Advanced Institute of Science and Technology

P321 14:10 PARAGON2 Depletion Validation Using SERPENT2 Monte Carlo Code¹

Mohamed Ouisloumen
Westinghouse Electric Company LLC

P322 14:35 Accuracy and Runtime Improvements with SCALE 6.2

Bradley T. Rearden*, Benjamin R. Betzler, Matthew A. Jessee, William J. Marshall, Ugur Mertuyrek, and Mark L. Williams
Oak Ridge National Laboratory

P323 15:00 Introduction to the Nuclear Energy Advanced Modeling and Simulation Workbench

Bradley T. Rearden*, Robert A. Lefebvre, Adam B. Thompson, and Brandon R. Langley
Oak Ridge National Laboratory

Oral Session No.54 [OS6F-II]

302 (3F)

April 19 (Wed), 13:20-15:25

Stochastics Process Analysis II

Chairs Andrea Zoia (CEA), Christophe Demazière (CUT)

P310 13:20 Neutron clustering: spatial fluctuations in multiplying systems at the critical point

Andrea Zoia¹, Eric Dumonteil²
¹CEA, ²IRSN

P309 13:45 Marduk: A Monte Carlo Code for Analyzing Stochastic Neutron Population Dynamics

Thomas M. Sutton¹, Andrew D. LaCharite¹, and Anil K. Prinja²
¹Naval Nuclear Laboratory, ²University of New Mexico

P303 14:10 Stochastic Models for Fast Neutron Multiplicity Counting of Plutonium

Sara A. Pozzi¹, Angela Di Fulvio¹, Tony H. Shin¹, Shaun D. Clarke¹, and David L. Chichester²
¹University of Michigan, ²Idaho National Laboratory

P289 14:35 SIMULATE-3K Analyses of Neutron Noise Response to Fuel Assembly Vibrations and Thermal-Hydraulic Parameters Fluctuation

D. Chionis^{1,2,*}, A. Dokhane¹, L. Belblidia³, M. Pecchia¹, G. Girardin⁴, H. Ferroukhi¹, A. Pautz^{2,5}
¹Paul Scherrer Institut
²Swiss Federal Institute of Technology in Lausanne
³Studsvik Scandpower, Inc.
⁴Kernkraftwerk Gösgen-Däniken AG
⁵Paul Scherrer Institute

P307 15:00 The Extinction Probability in Systems Randomly Varying in Time

I. Pázsit¹, M.M.R. Williams² and L. Pál³
¹Chalmers University of Technology
²Imperial College of Science
³Hungarian Academy of Sciences

Oral Session No.55 [OS1F]

Samda A (3F)

April 19 (Wed), 15:50-17:30

Finite Element Methods for Transport

Chairs Jim Morel (TAMU), William Martin (Michigan)

P041 15:50 QZ-Decomposition For Matrix-Free Sweep With High Order DG-FEM

Sebastián González-Pintor¹, Anders Ålund², Christophe Demazière¹
¹Chalmers University of Technology
²Fraunhofer Chalmers Research Centre for Industrial Mathematics

P042 16:15 Reactor physics analysis using Isogeometric Analysis and GeOPDEs

W.F.G. van Rooijen, R. Horita
University of Fukui

P043 16:45 Criticality Benchmarks for the Finite-Element-with-Discontiguous-Support Multigroup Method

Pablo A. Vaquer & Ryan G. McClarren
Texas A&M University

P027 17:05 DFEM Discretization of Quasidiffusion Moment Equations in 1D Slab Geometry

Dmitriy Y. Anistratov¹ and James S. Warsa²
¹North Carolina State University
²Los Alamos National Laboratory

Oral Session No.56 [OS2G-II]

Samda B (3F)

April 19 (Wed), 15:50-17:30

MC Applications II

Chairs Manuele Auffero (UCB), Song Hyun Kim (Kyoto)

P157 15:50 Particle Tracking Acceleration via Signed Distance Fields in DAGMC

Patrick C. Shriwise, Andrew Davis, Lucas J. Jacobson, Paul P.H. Wilson
University of Wisconsin - Madison

P146 16:15 Approximate Heat Transfer Solution for the Breed and Burn Molten Salt Reactor

Alisha Kasam, Eugene Schwageraus
University of Cambridge

P150 16:40 Analysis of BEAVRS Revision 2.0 LWR Whole Core Calculation Using MVP with JENDL-4.0

Motomu Suzuki, Yasushi Nauchi
Central Research Institute of Electric Power Industry

P152 17:05 Validation of SuperMC with BEAVRS Benchmark at Hot Zero Power Condition

Zhiyan Wang, Lijun Hao, Hongfei Liu, Bin Wu, Jing Song*
Institute of Nuclear Energy Safety Technology

Oral Session No.57 [OS9D]

402 A (4F)

April 19 (Wed), 15:50-17:30

CASL Multiphysics Methods

Chairs Benjamin Collins (ORNL), Scott Palmtag (NCSU)

- P364** 15:50 MC21 / CTF and VERA Multiphysics Solutions to VERA Core Physics Benchmark Progression Problems 6 and 7
Daniel J. Kelly III^{1,*}, Ann E. Kelly¹, Brian N. Aviles¹, Andrew T. Godfrey², Robert K. Salko², Benjamin S. Collins²
¹Naval Nuclear Laboratory
²Oak Ridge National Laboratory
- P365** 16:15 Modeling Thermal Expansion in VERA-CS
Scott Palmtag¹, Brendan Kochunas², Dan Jabaay², Zhuoran Han², Thomas Downar²
¹Core Physics Inc.
²University of Michigan
- P353** 16:40 Demonstration of MAMMOTH Strongly-Coupled Multiphysics Simulation with the Godiva Benchmark Problem
Yaqi Wang, Sebastian Schunert, Javier Ortensi, Frederick N. Gleicher, Vincent M. Laboure, Benjamin A. Baker, Mark DeHart, Richard C. Martineau
Idaho National Laboratory
- P355** 17:05 Quantification of ATF Concept Assessment Factors Using Multiphysics Simulations
James B. Tompkins¹, Ryan G. McClarren¹, Jason D. Hales²
¹Texas A&M University
²Idaho National Laboratory

Oral Session No.58 [OS12C]

402 B (4F)

April 19 (Wed), 15:50-17:30

Solving Inverse Problems

Chairs Chen Dubi (NRCN), James Peltz (NNSA)

- P395** 15:50 Neutron and Gamma-ray Energy Reconstruction for Characterization of Special Nuclear Material
S. D. Clarke*, M. C. Hamel, A. Di Fulvio, S. A. Pozzi
University of Michigan
- P406** 16:15 On the use of Analytical Techniques for Source Reconstruction Problems
Cássio B. Pazinato, Liliane B. Barichello
Universidade Federal do Rio Grande do Sul
- P396** 16:40 Sparse Bayesian Regression with Integrated Feature Selection for Nuclear Reactor Analysis
Kenneth Dayman, Brian Adey, Charles Weber
Oak Ridge National Laboratory
- P405** 17:05 Hierarchical Bayesian Modeling of Atomic Structural Disorder
Karl Pazdernik¹, Brian J. Reich¹, Katharine Page², Alyson G. Wilson¹
¹North Carolina State University
²Oak Ridge National Laboratory

Oral Session No.59 [OS5B]

301 (3F)

April 19 (Wed), 15:50-17:30

Sensitivity Analysis Methods

Chairs Don Bruss (SNL), Choong Sup Gil (KAERI)

- P228** 15:50 TSUNAMI-3D and SAMPLER/KENO comparison for sensitivity and uncertainty analysis in neutron multiplication factor for LWRs
A. Labarile, T. Barrachina, C. Mesado, R. Miró, G. Verdú
Universitat Politècnica de València
- P229** 16:15 A Generalized Perturbation Theory Solver In Rattlesnake Based On PETSc With Application To TREAT Steady State Uncertainty Quantification
Sebastian Schunert, Congjian Wang, Yaqi Wang, Fande Kong, Javier Ortensi, Benjamin Baker, Frederick Gleicher, Mark DeHart, Richard Martineau
Idaho National Laboratory
- P231** 16:40 Sensitivity Analysis Technique of Non-linear Problems Based on Sobol's Sensitivity Index and Fourier Analysis
Haining Zhou, Thomas Downar
University of Michigan
- P232** 17:05 Uncertainty Quantification Using SCALE 6.2 And GPT Techniques Implemented In Serpent
Giorgio Baiocco¹, Alessandro Petruzzi¹, Manuele Aufiero²
¹Nuclear And Industrial Engineering
²University of California

Oral Session No.60 [OS6E-I]

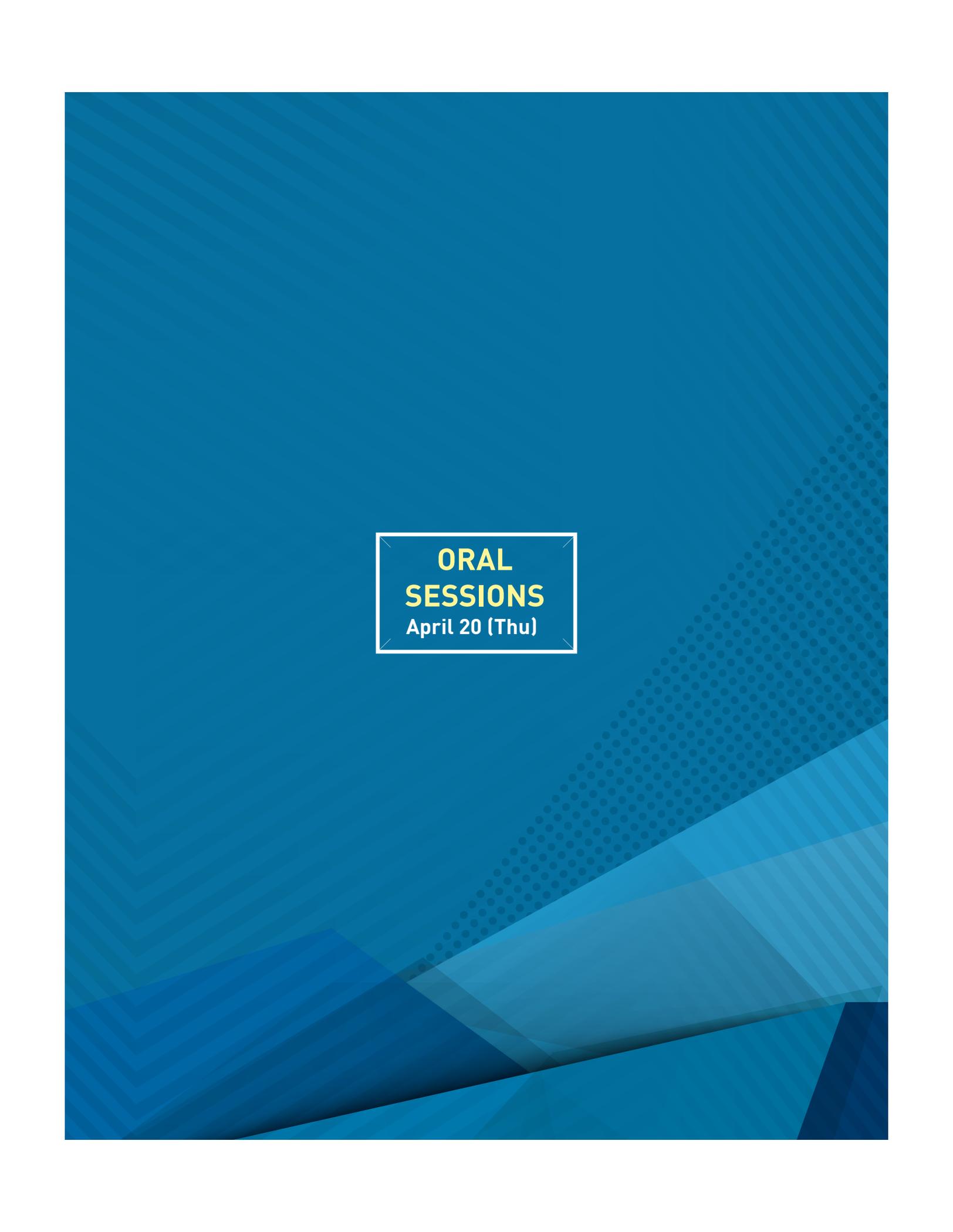
302 (3F)

April 19 (Wed), 15:50-17:30

Self-Shielding Methods I

Chairs Li Lei-Mao (CEA), Nam Zin Cho (KAIST)

- P300** 15:50 Validation of PARAGON2 Ultra-Fine-Energy-Mesh Method Against Deterministic Continuous Energy Calculation¹
Mohamed Ouisloumen
Westinghouse Electric Company LLC
- P301** 16:15 Practical Resolution of Angle Dependency of Multigroup Resonance Cross Sections Using Parametrized Spectral SPH Factors
Hansol Park and Han Gyu Joo*
Seoul National University
- P298** 16:40 Application of Resonance Interference Factor generated by Heterogeneous Slowing-down calculation in KARMA
Chae Ho Lim*, Hae Chan Lee and Hae Seuk Woo
KEPCO Nuclear Fuel Company
- P251** 17:05 The Pseudo-Resonant-Isotope-Model for Predicting the Resonance-Interference Effect in the Self-Shielding Calculation
Hongchun Wu¹, Qian Zhang^{1,2}, Tiejun Zu¹, Qingming He¹, Wei Shen^{1,5}
¹Xi'an Jiaotong University
²Harbin Engineering University
⁵Canadian Nuclear Safety Commission

The background is a solid blue color with various geometric patterns. On the left, there are diagonal lines forming a chevron pattern. On the right, there is a halftone dot pattern that fades out. At the bottom, there are overlapping, semi-transparent geometric shapes in different shades of blue.

**ORAL
SESSIONS**
April 20 (Thu)

Oral Session No.61 [OS1G-I]

Samda A (3F)

April 20 (Thu), 08:30-10:10

Spatial and Angular Discretization I

Chairs Yousry Azmy (NCSU), Peter Maginot (LLNL)

- P072** 08:30 A Residual-based A Posteriori Estimator of the Spatial Approximation Error for Discrete Ordinates Solutions of the Transport Equation
Nathan H. Hart, Yousry Y. Azmy
North Carolina State University
- P073** 08:55 Discretization of Low-Order Quasidiffusion Equations on Arbitrary Quadrilaterals in 2D $r - z$ Geometry
Jesse P. Jones¹, Dmitriy Y. Anistratov¹, Jim E. Morel²
¹*North Carolina State University*
²*Texas A&M University*
- P071** 09:20 Subplane-based Control Rod Decussing Techniques for the 2D/1D Method in MPACT¹
Aaron M. Graham¹, Benjamin S. Collins², Thomas Downar¹
¹*University of Michigan*
²*Oak Ridge National Laboratory*
- P076** 09:45 Impact of Photon Transport on Power Distribution
LIEGEARD Clément^{1,2}, CALLOO Ansar¹, MARLEAU Guy², GIRARDI Enrico¹
¹*Électricité de France*
²*Institut de génie nucléaire*

Oral Session No.62 [OS2C-III]

Samda B (3F)

April 20 (Thu), 08:30-10:10

Variance Reduction and Hybrids III

Chairs Ding She (Tsinghua), William Walters (PSU)

- P114** 08:30 Application of Higher Order Fission Matrix for Real Variance Analysis in McCARD Monte Carlo Eigenvalue Calculation
Ho Jin Park¹, Hyun Chul Lee²
¹*Korea Atomic Energy Research Institute*
²*Pusan National University*
- P115** 08:55 Application of an Advanced Variance Reduction Technique for Bulk Shield Calculations of the IFMIF-DONES facility
Yuefeng Qiu, Stanislav Simakov, Ulrich Fischer
Karlsruhe Institute of Technology
- P117** 09:20 Monte Carlo Whole Core Simulation Acceleration Based on Coupled Global Weight Window and Uniform Fission Site Method
Guangyao Sun, Jing Song*, Lijuan Hao, Pengcheng Long, Liqin Hu
Institute of Nuclear Energy Safety Technology
- P118** 09:45 Automated ADVANTG Variance Reduction in a Proton Driven System
Kenneth A. Van Riper¹ and Robert L. Metzger²
¹*White Rock Science*
²*Radiation Safety Engineering*

Oral Session No.63 [OS9E]

402 A (4F)

April 20 (Thu), 08:30-10:10

NURESAFE Multiphysics Methods

Chairs Kiril Velkov (GRS), Soeren Kliem (HZDR)

- P367** 08:30 Simulation of a Main Steamline Break scenario using the 3D neutron kinetic core model DYN3D coupled with the CFD software TRIO_U
Alexander Grahn, André Gommlich, Sören Kliem
Helmholtz-Zentrum Dresden-Rossendorf
- P368** 08:55 CTF / DYN3D Multi-Scale Coupled Simulation of a Rod Ejection Transient on the Salomé Platform
Yann Périn, Kiril Velkov
Gesellschaft fuer Anlagen- und Reaktorsicherheit (GRS) gGmbH
- P369** 09:20 Coupled calculations COBAYA4/CTF for different MSLB scenarios in the frame of NURESAFE project
S. Sánchez-Cervera¹, A. Sabater, D. Cuervo, N. García-Herranz
Universidad Politécnica de Madrid
- P351** 09:45 Multiphysics Simulation of Fission Gas Production and Release in Light Water Reactor Fuel with the MOOSE Application Redwing
Michael Rose, Thomas Downar
University of Michigan

Oral Session No.64 [OS12D]

402 B (4F)

April 20 (Thu), 08:30-10:10

Analysis of Safeguards Measurements

Chairs Imre Pazsit (CUT), Chen Dubi (NRCN)

- P393** 08:30 A Combined Computational and Measurement Approach for Safeguards Verifications of Subcritical Cores
Andrey Berlizov
International Atomic Energy Agency
- P402** 08:55 Numerical Convergence and Validation of the DIMP Inverse Particle Transport Model
Noel Nelson, Yousry Azmy
North Carolina State University
- P401** 09:20 Development and Implementation of GloveBox Cleanout Assistance Tool (BCAT) to Detect the Presence of MOX by Computational Approach
Hironobu Nakamura, Hideo Nakamichi, Yasunobu Mukai, Takashi Hosoma, Tsutomu Kurita
Japan Atomic Energy Agency
Adrienne M. LaFleur
Los Alamos National Laboratory
- P398** 09:45 Spectral X-ray Radiography for Safeguards at Nuclear Fuel Fabrication Facilities: A Feasibility Study
Andrew J. Gilbert*, Benjamin S. McDonald, L. Eric Smith
Pacific Northwest National Laboratory

Oral Session No.65 [OS2H-IV]

301 (3F)

April 20 (Thu), 08:30-10:10

MC Methods General IV

Chairs Paul Romano (ANL), Peng Zhang (UNIST)

- P099** 08:30 Limits on the efficiency of event-based algorithms for Monte Carlo neutron transport
Paul K. Romano, Andrew R. Siegel
Argonne National Laboratory
- P100** 08:55 Delta-tracking in the GPU-accelerated WARP Monte Carlo Neutron Transport Code
Kelly L. Rowland¹, Ryan M. Bergmann², R. N. Slaybaugh¹, Jasmina L. Vujić¹
¹University of California
²Paul Scherrer Institute
- P125** 09:20 A New Accumulation Scheme for the Monte Carlo Implementation of the Modified Power Method
Peng Zhang, Hyunsuk Lee, Deokjung Lee
Ulsan National Institute of Science and Technology
- P138** 09:45 Maximum Likelihood Estimators and Extreme Value Theory for Uncertainty Quantification in Criticality Analysis
Max Shepherd, Geoff Dobson, Ben Lindley, Chris Baker, Simon Richards, Paul Smith*
Amec Foster Wheeler

Oral Session No.66 [OS6E-II]

302 (3F)

April 20 (Thu), 08:30-10:10

Self-Shielding Methods II

Chairs Li Lei-Mao (CEA), Alain Hébert (EPM)

- P296** 08:30 Introduction of a Resonant Up-scattering Treatment for Multi-group Cross Section Generation
Ron Dagan¹, Maarten Becker², Aleksandar Ivanov¹
¹Karlsruhe Institute of Technology
²Nuclear Engineering Consultancy Dr. Maarten Becker
- P297** 08:55 A New Tone's Method in APOLLO3® and its Application to ZPPR Benchmarks
Li Mao, Igor Zmijarevic
CEA-Saclay
- P252** 09:20 Extension of MC²-3 for Generation of Multigroup Cross Sections in Thermal Energy Range
B. K. Jeon¹, W. S. Yang¹, Y. S. Jung^{1,2} and C. H. Lee²
¹Purdue University
²Argonne National Laboratory
- P302** 09:45 CALENDF Probability Tables Advanced Self-shielding Factors Usage in the Inventory Code FISPACT-II
J.-Ch. Sublet, M. Fleming and M. R. Gilbert
United Kingdom Atomic Energy Authority

Oral Session No.67 [OS1G-II]

Samda A (3F)

April 20 (Thu), 10:30-12:10

Spatial and Angular Discretization II

Chairs Peter Maginot (LLNL), Yousry Azmy (NCSU)

- P078** 10:30 On-The-Fly Multigroup Weighting in PARTISN
Thomas G. Saller, Randal S. Baker, Jon A. Dahl
Los Alamos National Laboratory
- P048** 10:55 Asymptotic Convergence of the Angular Discretization Error in the Scalar Flux Solution of the Discrete Ordinates Transport Equation with Isotropic Scattering in Two-Dimensional Cartesian Geometry
Xiaoyu Hu, Yousry Y. Azmy
North Carolina State University
- P049** 11:20 Goal Oriented Regional Angular Adaptive Algorithm for the S_N Equations
Bin Zhang*, Liang Zhang, Cong Liu and Yixue Chen
North China Electric Power University
- P009** 11:45 Calculation and Verification of Assembly Discontinuity Factors for the DRAGON/PARCS code sequence
Luca Liponi¹, Julien Taforeau², Alain Hébert¹
¹École Polytechnique de Montréal
²Institut de Radioprotection et de Sûreté Nucléaire

Oral Session No.68 [OS2C-IV]

Samda B (3F)

April 20 (Thu), 10:30-12:10

Variance Reduction and Hybrids IV

Chairs Ho Jin Park (KAERI), John Wagner (INL)

- P106** 10:30 Application of Weight Window Technique in Monte Carlo Calculation for Beam Design of Boron Neutron Capture Therapy
Wei-Lun Huang, Po-Lin Liao, Zhen-Fan You, Yen-Wan Hsueh Liu
National Tsing Hua University
- P119** 10:55 Application of the RAPID Fission Matrix Methodology to 3-D Whole-core Reactor Transport
William J. Walters*
Penn State University
- P116** 11:20 Comparisons of Three Monte Carlo Transport Codes in Cask Shielding Calculations: MCNP, MAVRIC, and ADVANTG/MCNP
Po-Chen Lai, Yu-Shiang Huang, Rong-Jiun Sheu*
National Tsing Hua University
- P111** 11:45 A Hybrid Stochastic Deterministic Approach for Full Core Neutronics
Seyed Rida Housseiny Milany, Guy Marleau
Ecole Polytechnique de Montreal

Oral Session No.69 [OS9B]

402A (4F)

April 20 (Thu), 10:30-12:10

Multiphysics Applications

Chairs William Wieselquist (ORNL), Masahiro Tatsumi (NEL)

- P357** 10:30 Modeling 3D Hydrogen Diffusion And Localized Hydride Formation In Zirconium Alloy Cladding Using High Fidelity Multi-Physics Coupled Codes.
Ahmed Aly¹, Kyle Gamble², Maria Avramova¹, Richard Williamson², Kostadin Ivanov¹
¹North Carolina State University
²Idaho National Laboratory
- P358** 10:55 Multiphysics Simulation of Fuel Relocation for a Single Fuel Pin During Startup
Matthew Lund¹, Frederick N. Gleicher², Sebastian Schunert², and Mark DeHart²
¹University of Utah
²Idaho National Laboratory
- P359** 11:20 MIMIC: Michigan Interface for Multi-state In-memory Coupling with STAR-CCM+ for Nuclear Applications
D. J. Walter, V. Petrov, N. Adamowicz, A. Manera
University of Michigan
- P360** 11:45 Development of a Clad Activation Capability in BISON using ORIGEN
W. A. Wieselquist
Oak Ridge National Laboratory

Oral Session No.70 [OS1C]

402 B (4F)

April 20 (Thu), 10:30-12:10

Semi-Analytic Methods

Chairs Piero Ravetto (PT), Brendan Kochunas (Michigan)

- P023** 10:30 Application of the adjoint spectral Green's function-constant nodal method for one-speed X, Y-geometry discrete ordinates source-detector problems
Jesús Pérez Curbelo, Ricardo C. Barros
Universidade do Estado do Rio de Janeiro
- P024** 10:55 Neutron Diffusion and Transport Problems in Fluid-fuel Reactors
S. Dulla¹, A.K. Prinja², P. Ravetto¹
¹Politecnico di Torino
²University of New Mexico
- P275** 11:20 Analysis of Alpha Modes in Multigroup Diffusion
Richard Sanchez¹, Daniele Tomatis², Igor Zmijarevic² and Kevin Dugan²
¹Seoul National University
²CEA
- P034** 11:45 A Multilevel in Space and Energy Solver for Multigroup Diffusion Eigenvalue Problems
Ben C. Yee, Brendan Kochunas, Edward W. Larsen
University of Michigan

Oral Session No.71 [OS2H-V]

301 (3F)

April 20 (Thu), 10:30-12:10

MC Methods General V

Chairs Jiankai Yu (UNIST), Thomas Sutton (KAPL)

- P392** 10:30 Acceleration of Monte Carlo Methods on Heterogeneous CPU-GPU Platforms Using Kernel Density Estimators
Timothy P. Burke¹, Brian C. Kiedrowski¹, William R. Martin¹, and Forrest B. Brown²
¹University of Michigan
²Los Alamos National Laboratory
- P156** 10:55 Development of McCad as an Integrated Interface Tool for the CAD to MC Geometry Conversion
Lei Lu, Yuefeng Qiu, Christian Wegmann, Ulrich Fischer
Karlsruhe Institute for Technology
- P159** 11:20 Unstructured Mesh Geometry Processing Method Based on Feature Size Tree in Monte Carlo Particle Transport Calculation
Lei Wang, Shengpeng Yu, Guangyao Sun, Peng He, Jing Song*
Institute of Nuclear Energy Safety Technology
- P132** 11:45 Calculating Resonance Parameter Sensitivity Coefficients in SCALE
Abdulla Alhajri¹, Vladimir Sobes², Chris Perfetti², Benoit Forget¹
¹Massachusetts Institute of Technology
²Oak Ridge National Laboratory

Oral Session No.72 [OS6E-III]

302 (3F)

April 20 (Thu), 10:30-12:10

Self-Shielding Methods III

Chairs Alain Hébert (EPM), Li Lei-Mao (CEA)

- P250** 10:30 A Multigroup, Lumped Parameter MOC Approach for Subgroup Self-Shielding in MPACT
S. Stimpson¹, Y. Liu², B. Collins¹, K. Clarno¹
¹Oak Ridge National Laboratory
²University of Michigan
- P299** 10:55 Resonance Self-shielding Methods for Pin-resolved Direct Transport in LWR calculations
Yuxuan Liu and William Martin
University of Michigan
- P249** 11:20 Development of the CASL-VERA V4.2m5 MPACT 51-group Libraries with ENDF/B-VII.0 and VII.1
Kang Seog Kim¹, Mark L. Williams¹, Dorothea Wiarda¹, Kevin T. Clarno¹, and Yuxuan Liu²
¹Oak Ridge National Laboratory
²University of Michigan
- P314** 11:45 Implementation of Molten Salt Reactor Tools in SCALE¹
Benjamin R. Betzler¹, Jeffrey J. Powers¹, Nicholas R. Brown², and Bradley T. Rearden¹
¹Oak Ridge National Laboratory
²The Pennsylvania State University

Oral Session No.73 [OS1D]

Samda A (3F)

April 20 (Thu), 13:20-15:25

Transport Acceleration Methods

Chairs Yaqi Wang (INL), Wenbin Wu (NPIC)

- P029** 13:20 Multi-Level Acceleration of Scattering-Source Iterations with Application to Electron Transport
Clif Drumm and Wesley Fan
Sandia National Laboratories^a
- P031** 13:45 Nonlinear Diffusion Acceleration in Voids for the Weighted Least-Square Transport Equation
Hans R. Hammer¹, Jim E. Morel¹, and Yaqi Wang²
¹*Texas A&M University*
²*Idaho National Laboratory*
- P032** 14:10 Linear Diffusion-Synthetic Acceleration with Voids
Jijie Lou, Jim E. Morel
Texas A&M University
- P035** 15:00 Improved Two-Level p-CMFD Acceleration in Neutron Transport Calculation
Seungsu Yuk and Nam Zin Cho*
Korea Advanced Institute of Science and Technology

Oral Session No.74 [OS2F-II]

Samda B (3F)

April 20 (Thu), 13:20-15:25

Uncertainty Propagation in MC II

Chairs Hyung Jin Shim (SNU), Deokjung Lee (UNIST)

- P140** 13:20 Monte Carlo Region Isolation Method Used for Geometrical Perturbation
Gang Wang, Ganglin Yu, Kan Wang
Tsinghua University
- P137** 13:45 Nuclear Data Uncertainty Propagation with the Stochastic Sampling Module in RMC
Yishu Qiu*, Guanlin Shi, Kan Wang
Tsinghua University
- P141** 14:10 Sensitivity and Uncertainty Analysis for Coolant Void Reactivity in a CANDU Fuel Lattice Cell Model
Seung Yeol Yoo, Hyung Jin Shim*
Seoul National University
- P136** 14:35 Optimizing HFIR Isotope Production through the Development of a Sensitivity-Informed Target Design Process¹
Christopher Perfetti*, Susan Hogle, Seth Johnson, Bradley Rearden, and Thomas Evans
Oak Ridge National Laboratory
- P131** 15:00 Advanced Capability of Transport and Depletion Calculation of SuperMC3.0 for Fusion and Fission Applications
Jing Song*, Liqin Hu, Shengpeng Yu, Pengcheng Long, Lijuan Hao, Mengyun Cheng, Huaqing Zheng, Guangyao Sun, Qi Yang, Bin Wu, Yican Wu
Institute of Nuclear Energy Safety Technology

Oral Session No.75 [OS6A-II]

402 A (4F)

April 20 (Thu), 13:20-15:25

Validation with Core Benchmarks II

Chairs Rodolfo Ferrer (Studsvik), Benjamin Collins (ORNL)

- P265** 13:20 Analyzing the BEAVRS HZP case with KMACS using 2-group data from SCALE-NEWT, HELIOS and nTRACER
Matias Zilly, Jérémy Bousquet, Kiril Velkov¹, Young Suk Ban, Han Gyu Joo²
¹*Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH*
²*Seoul National University*
- P258** 13:45 AP1000® Benchmarking of VERA Neutronics Toolset
C. Gentry¹, A. Godfrey¹, T. Pandya¹, G. Davidson¹, F. Franceschini²
¹*Oak Ridge National Laboratory*
²*Westinghouse Electric Company LLC*
- P267** 14:10 Explicit decay heat calculation in the nodal diffusion code DYN3D
Y. Bilodid^{1,2}, E. Fridman¹, D. Kotlyar³, E. Shwageraus²
¹*Helmholtz-Zentrum Dresden-Rossendorf*,
²*University of Cambridge*
³*Georgia Institute of Technology*
- P260** 14:35 Calculating V-1000 Core Model With Serpent 2 - HEXTRAN Code Sequence
Ville Sahlberg
VTT Technical Research Centre of Finland
- P274** 15:00 nTRACER Whole Core Transport Solutions to C5G7-TD Benchmark
Min Ryu and Han Gyu Joo*
Seoul National University

Oral Session No.76[OS1I-III]

402 B (4F)

April 20 (Thu), 13:20-15:25

Stochastic Behavior and Transport III

Chairs Richard Sanchez (SNU), Martin Frank (Aachen)

- P063** 13:20 Clustering, TravelingWaves and Solitons in the Monte-Carlo Criticality Simulation of Decoupled and Confined Medium
Eric Dumonteil, Yann Richet, Giovanni Bruna
Institut de Radioprotection et de Sûreté nucléaire
- P064** 13:45 A Deterministic Transport Method for Calculating the Moments of the Fission Number Distribution
Erin J. Davis-Fichtl¹, Anil K. Prinja²
¹*Los Alamos National Laboratory*
²*University of New Mexico*
- P062** 14:10 Modeling Zero Power Reactor Noise and Neutron Count Distribution: A Stochastic Differential Equations Approach
C. Dubi¹, R. Atar²
¹*Nuclear Research Center-Negev*
²*Technion-Israel Institute of Technology*
- P068** 14:35 Monte Carlo Calculation of Moments of the Neutron Number and Fission Number for Stochastic Systems in MCATK
Travis J. Trahan
Los Alamos National Laboratory

April 20 (Thu), 13:20-15:25

Assimilation using Sensitivity Coefficients

Chairs Go Chiba (Hokkaido), Abdelhamid Dokhane (PSI)

- P233**
13:20
Implementation of Fuel Burnup Sensitivity Calculation Capability into a Deterministic Reactor Physics Code System CBZ for Accelerator-Driven System Multi-Cycle Burnup Calculations
Go Chiba¹, Tomohiro Endo², Wilfred F.G. van Rooijen³, Cheol Ho Pyeon⁴
¹Hokkaido University, ²Nagoya University
³University of Fukui, ⁴Kyoto University
- P234**
13:45
Continuous Energy Cross Section Adjustment: a New Method to Generalize Nuclear Data Assimilation for a Wider Range of Applications.
Manuele Aufiero¹, Massimiliano Fratoni¹, Giuseppe Palmiotti², Massimo Salvatores²
¹University of California
²Idaho National Laboratory
- P235**
14:10
Case Study of Data Assimilation Methods with the LWR-Proteus Phase II Experimental Campaign
Daniel J. Siefman^{1,2}, Mathieu Hursin^{1,2}, Peter Grimm², Andreas Pautz¹
¹EPFL, ²PSI
- P238**
14:35
Verification and Validation of STREAM Source Term Calculation Capability
Bamidele Ebiwonjumi¹, Sooyoung Choi¹, Deokjung Lee^{1,*}, Ho Cheol Shin²
¹Ulsan National Institute of Science and Technology
²Korea Hydro & Nuclear Power Co. Central Research Institute

April 20 (Thu), 13:20-15:25

Homogenization and Leakage Models II

Chairs Kang Seog Kim (ORNL), Igor Zmijarevic (CEA)

- P294**
13:20
Discontinuity Factors for 1D P_N Equations using a Finite Element Method
A. Vidal-Ferràndiz¹, S. González-Pintor², D. Ginestar³, G. Verdú¹, C. Demazière⁴
¹Universitat Politècnica de València
²Chalmers University of Technology
³Universitat Politècnica de València
⁴Chalmers University of Technology
- P295**
13:45
APOLLO3[®] Homogenization Techniques for Transport Core Calculations - Application to the ASTRID CFV Core
J-F. Vidal, P. Archier, B. Faure, V. Jouault, J-M. Palau, V. Pascal, G. Rimpault
F. Auffret, L. Graziano, E. Masiello, S. Santandrea CEA
- P253**
14:10
Automatic Coarse Energy Group Structure Optimization by Minimizing Reaction Rate Differences for the SCALE and CASL Code Systems
Kang Seog Kim, Mark L. Williams, Dorothea Wiarda and Ugur Mertuyrek
Oak Ridge National Laboratory
- P255**
14:35
Application of SPH Method for Sodium Fast Reactor Analysis
Reuven Rachamin, Sören Kliem
Helmholtz-Zentrum Dresden-Rossendorf
- P410**
15:00
Monitoring flux and power in nuclear reactors with data assimilation and reduced models
H. Gong¹, J.P. Argaud¹, B. Bouriquet¹, Y. Maday², O. Mula³
¹Électricité de France
²Sorbonne Université
³Université Paris-Dauphine

The background is a complex geometric composition of various shades of orange and yellow. It features several overlapping, semi-transparent shapes that create a sense of depth and movement. A prominent feature is a diagonal band of small, dark orange dots that tapers from the bottom right towards the top right. The overall aesthetic is modern and professional, typical of a conference or academic event.

**POSTER
SESSIONS**

April 17 (Mon), 18:00 - 20:00

Deterministic TransportChair **Richard Sanchez (SNU)**

- P001** PWR Core Analysis Using Helios, Serpent and PARCS Codes
Giorgio Baiocco, Alessandro Petruzzi
Nuclear And Industrial Engineering (NINE)
- P012** Neutronics modeling of the CROCUS reactor with SERPENT and PARCS codes
Adolfo Rais¹, Daniel Siefman¹, Mathieu Hursin², Andrew Ward³, Andreas Pautz^{1,2}
¹École polytechnique fédérale de Lausanne
²Paul Scherrer Institut ³University of Michigan
- P013** TORT-TD Transient Simulations of the C5G7-TD Benchmark
A. Seubert, K. Velkov
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
- P015** Assessment of 2D-Transport/1D-Diffusion Approximations in a Pin Resolved Variational Nodal Method for PWR Calculations
Tengfei Zhang^{1*}, Yongping Wang¹, E. E. Lewis², M. A. Smith³, W. S. Yang⁴ and Hongchun Wu¹
¹Xi'an Jiaotong University ²Northwestern University
³Argonne National Laboratory ⁴Purdue University
- P022** A Response Matrix Method for Multigroup Slab-geometry Discrete Ordinates Problems in Non-multiplying Media
Odair P. Silva, Hermes Alves Filho and Ricardo C. Barros
Universidade do Estado do Rio de Janeiro - UERJ
- P025** Comparison of 1D Green's Functions in the PN and BN Approximations of Monoenergetic Neutron Transport Theory
G. Giudicelli, C. Josey, J. Miao and B. Ganapol
MIT
S. Woolf
ARCON CORP
- P028** On The Acceleration Of The Source Iteration Method
Daniella Machado Schulz, Rudnei Dias da Cunha, Liliane Basso Barichello
Universidade Federal do Rio Grande do Sul
- P030** Improvement of the 2D/1D Method in MPACT Using the Subplane Scheme¹
Aaron M. Graham¹, Benjamin S. Collins², Thomas Downar¹
¹University of Michigan, ²Oak Ridge National Laboratory
- P036** Energy-Dependent Implicit Filtered P_N Method for Thermal Radiation Transport
Vincent M. Laboure, Ryan G. McClarren
Texas A&M University
- P040** Different modes associated with the neutron diffusion equation and their computation
A. Carreño, A. Vidal-Ferrándiz, D. Ginestary, G. Verdú, M.T. Capilla
Universitat Politècnica de València
- P044** Development of MoCha-Foam: a new Method of Characteristics Neutron Transport Solver for OpenFOAM
Paul Cosgrove, Eugene Shwageraus
University of Cambridge
- P045** Verification of MOckingbird, an Unstructured-Mesh, Method of Characteristics Implementation Using the MOOSE Multiphysics Framework
Derek R. Gaston¹, Benoit Forget², Kord S. Smith², Richard C. Martineau¹
¹Idaho National Laboratory
²Massachusetts Institute of Technology

- P053** A 2D/3D coupling method for transport calculation
Liu Zhouyu*, Liang Liang, Cao Liangzhi, Wu Hongchun
Xi'an Jiaotong University
- P055** Efficient Procedure For Radial MOC and Axial SN coupled 3D Neutron Transport Calculation
Xiao Tang^{1,2}, Qing Li¹, Xiaoming Chai¹, Xiaolan Tu¹, Wenbin Wu¹, Kan Wang²
¹Nuclear Power Institute of China ²Tsinghua University
- P058** 2-D/3-D Reactor Analysis using Orthogonal-Mesh S_N with Embedded 2-D Method of Characteristics¹
Mitchell T.H. Young^{1,2}, Benjamin Collins², William R. Martin¹
¹University of Michigan ²Oak Ridge National Laboratory
- P074** An Activation Calculation in a Deep Penetration Problem with AETIUS: An Easy Modeling Discrete Ordinates Transport Code Using Unstructured Tetrahedral Mesh, Shared Memory Parallel
Jong Woon Kim* and Young-Ouk Lee
Korea Atomic Energy Research Institute
- P077** Convergence Analysis of Partial Current Based Coarse Mesh Finite Difference Method (p-CMFD) with Two Parameter Relaxation
Chang Je Parka^{1*}, Moon-ghu Park¹, Ser Gi Hong²
¹Sejong University ²Kyung Hee University
- P079** Order of Accuracy of Spatial Discretization of Method of Characteristic
Jipu Wang and William Martin
University of Michigan
Benjamin Collins
Oak Ridge National Laboratory
- P391** Radiation Shielding Calculation using the Capabilities of Large-scale Mesh Generation and Efficient Parallel Computing in JSNT on Tens of Thousands of Processors
Tangpei Cheng, Zeyao Mo, Guangchun Zhang, Jie Yan, Quan Xu, Yuanguang Fu, Li Deng
Institute of Applied Physics and Computational Mathematics

April 17 (Mon), 18:00 - 20:00

Monte CarloChair **John Wagner (INL)**

- P085** Iteration-Free Coupled Monte Carlo with Thermal Hydraulic Method
Dan Kotlyar¹, Manuele Aufero², Eugene Shwageraus³, Massimiliano Fratoni²
¹Georgia Institute of Technology
²University of California ³University of Cambridge
- P091** Sensitivity Analysis Of PWR Keff To Multi-temperature Nuclear Data By RMC
Shenglong Qiang, Qiang Yin, Wei Lu, Qing Li, Xiaoming Chai
Nuclear Power Institute of China
- P093** Internal Coupling Scheme in RMC with Thermal-hydraulics Feedback and On-the-fly Doppler-Broadening Method
Ouwen Yexin, Shanfang Huang, Shichang Liu, Kan Wang
Tsinghua University
- P103** Development of a Radiation Shielding Monte Carlo Code: RShieldMC
Shenshen GAO^{1,2}, Zhen WU^{1,3}, Xin WANG^{1,2}, Rui QIU^{1,2}, Chunyan LI^{1,3}, Wei LU^{1,2}, Junli LI^{1,2}
^{1,2}Tsinghua University ³Nuctech Company Limited
- P107** Nth-order Multi-Response CADIS Method for Optimizing Variance Reduction Parameter in Monte Carlo Simulation
Do Hyun KIM¹, Chang Ho SHIN¹, and Song Hyun KIM²
¹Hanyang University ²Kyoto University

- P113** An Analytical Study of Monte Carlo Source Term Estimators in Plasma Edge Simulations of Fusion Reactors
B. Mortier, M. Baelmansy, G. Samaey
KU Leuven
- P127** MOTIVE - A New Modular Burn-up Code
Volker Hannstein, Matthias Behler, Fabian Sommer
Gesellschaft für Anlagen- und Reaktorsicherheit(GRS) gGmbH
- P139** SUMMON: A Sensitivity And Uncertainty Methodology For MONte Carlo Codes
P. Romojaró¹, F. Álvarez-Velarde² and N. García-Herranz³
¹UPM, ²CIEMAT, ³UPM
- P142** Delayed Neutron Fraction Calculation in PFBR using MCNP
Subhrojit Bagchi, Sujoy Sen, Neethu H. Stephen, A. John Arul
Indira Gandhi Centre for Atomic Research
- P143** Void Swelling in VVER-1000 Pressure Vessel Internals
Davit Harutyunyan^{1,2,*}, Ihor Mirzov³, Martin Schulc²
¹FNSFE, ²Research Center Rez, ³UJV Rez a.s
- P144** Methodology for Predicting Initial Core Loading of Research Reactors Using Neutron Flux Ratios
K. Hossny, M. Ettawila
Alexandria University
- P148** Validation of McCARD for VHTR core with HTR Benchmark
Jinsu Park¹, Tae Yong Han², Hyun Chul Lee^{3,*}, Deokjung Lee¹
¹Ulsan National Institute of Science and Technology
²Korea Atomic Energy Research Institute
³Pusan National University
- P153** Pre-Conceptual Core Design of a LBE-Cooled Fast Reactor (BLESS)
Ziguan Wang, Luyu Zhang, Eing Yee Yeoh, Linsen Li, Feng Shen
State Power Investment Corporation Research Institute
- P154** Monte Carlo-Deterministic Hybrid Analysis for a Soluble-Boron-Free SMR
Mohd-Syukri Yahya and Yonghee Kim*
Korea Advanced Institute of Science and Technology
- P155** Preliminary Estimation of the Modeling Error in the PGsFR Core Neutronics Design
Sunghwan Yun*, Jong Hyuck Won, Donny Hartanto, and Jae-Yong Lim
Korea Atomic Energy Research Institute
- P158** SERPENT Performance with Hybrid Combinatorial and Stereolithographic Geometry*
A. Talamo¹, Y. Gohar¹, and J. Leppänen²
¹Argonne National Laboratory
²VTT Technical Research Centre
- P160** Prompt Alpha Calculation With Monte Carlo Code JMCT
Rui Li^{1,2}, Tao Ye¹, Gang Li^{1,2,*}, Yun Bai¹, Li Deng^{1,2}
¹Institute of Applied Physics and Computational Mathematics
²CAPE software Center for High Performance Numerical Simulation
- P161** A Weighted Monte Carlo Solution of the Neutron Kinetics Equations
Jie Li¹, Yunzhao Li^{1,*}, Qi Zheng¹, Wei Shen^{1,2}
¹Xi'an Jiaotong University
²Canadian Nuclear Safety Commission
- P163** Radiosensitization Effect of the Gold Nanoparticle in the Cell Simulated with NASIC Code
Yizheng Chen^{1,2}, Chunyan Li^{1,3}, Junli Li^{1,2,*}
^{1,2}Tsinghua University, ³Nuctech Company Limited
- P170** Mcnpx Simulation Method for Hand Exposure Patient Using 3d Scanned Model of Object with Free Curved Surfaces
Jiseok Kim, Han Rim Lee, Siwan Noh, Jaiki Lee
Korea Atomic Energy Research Institute

- P173** Continued Investigation of Metrics for Predicting Undersampling Biases in Monte Carlo Simulations
Christopher Perfetti* and Bradley Rearden
Oak Ridge National Laboratory

Poster Session [PS3]

3F Lobby

April 17 (Mon), 18:00 - 20:00

Nuclear Data/Uncertainty

Chair **Won Sik Yang (Purdue)**

- P178** Benchmark Calculation of KRITZ-2 by DRAGON/PARCS
M. Choi, H. Choi, R. Hon
General Atomics
- P184** Measurement of Different Neutron Induced Reactions in ²⁵²Cf Spontaneous Fission Neutron Spectrum
Martin Schulc, Davit Harutyunyan, Michal Košťál, Evžen Novák, and Bohumil Janský
Research Centre Rez
- P187** Availability of Neutronics Benchmarks in the ICSBEP and IRPhEP Handbooks for Computational Tools Testing
John D. Bess, J. Blair Briggs (retired)
Idaho National Laboratory
Tatiana Ivanova, Ian Hill, Jim Gulliford
OECD Nuclear Energy Agency
- P190** Creation of a Database of Uncertainties for ICSBEP Handbook and Tool for Covariance Generation
Sanggeol Jeong, Ian Hill, Hiroshi Kikusato, and Deokjung Lee*
Ulsan National Institute of Science and Technology
- P195** Problem-Dependent ORIGEN Library Compression to Increase Computational Efficiency
S. M. Richards, S. E. Skutnik
University of Tennessee
- P199** NJOY Maximum Energy Limit For Thermal Neutron Cross Section Treatment
Yunhuang Zhang, Aaron J. Holzaepfel, Marvin L. Adams
Texas A&M University
- P206** Uncertainty Quantification of Bell Factor for Sjöstrand Method using Random Sampling Method
Toshiki Kimura, Tomohiro Endo, Akio Yamamoto
Nagoya University
- P207** A Study of Measured, Experimental, and Nuclear Data Uncertainties for Subcritical Benchmark Experiments
J. Hutchinson, T. Cutler, T. Grove, M. Smith-Nelson, R. Bahrn
Los Alamos National Laboratory
- P226** Recent Progresses of Research on Sensitivity and Uncertainty Analysis for Reactor-Physics Calculation at XJTU
Liangzhi Cao, Hongchun Wu, Chenghui Wan, Yong Liu, Chao Yang, Wei Shen
Xi'an Jiaotong University
- P220** Uncertainty Quantification of the BEAVRS Benchmark Problem at the Steady State
Chenghui Wan, Liangzhi Cao, Hongchun Wu
Xi'an Jiaotong University
- P218** Impact of Fuel Behaviour Uncertainties on UAM-LWR TMI-1 Pin Cell Case
A. Taavitsainen, R. Vanhanen, T. Ikonen, V. Valtavirta
VTT Technical Research Centre of Finland Ltd.
- P225** Uncertainty Analysis of TREAT Standard Fuel Assembly and Minimum Critical Core Models
Haining Zhou, Volkan Seker, Yunlin Xu, Thomas Downar
University of Michigan

- P227** Implementation of the CLUTCH method in the MORET code
Alexis Jinaphanh
Institut de Radioprotection et de sûreté nucléaire
- P230** Global Sensitivity Analysis of TRACE Physical Model Parameters based on BFBT Benchmark
Xu Wu, Chen Wang, Tomasz Kozłowski
University of Illinois at Urbana-Champaign
- P237** Kriging-based Surrogate Models for Uncertainty Quantification and Sensitivity Analysis
Xu Wu, Chen Wang, Tomasz Kozłowski
University of Illinois at Urbana-Champaign
- P245** Simulations of the Turbulent Flow in the Thermal-Hydraulic Out-of-Reactor Safety (THORS) with the CFD Code STAR-CCM+¹
Marc-Olivier G. Delchini, Emilian L. Popov, David W. Pointer
Oak Ridge National Laboratory

Poster Session [PS4]

3F Lobby

April 17 (Mon), 18:00 - 20:00

Reactor Physics

Chair Deokjung Lee (UNIST)

- P254** Hybrid Nodal Green's Function Method with SP₃ for Pin-by-pin Calculation
Tzung-Yi Lin and Yen-Wan Hsueh Liu
National Tsing Hua University
- P256** nTRACER and KENO V.a Calculations of the VENUS-9/1 Experimental Benchmark
Alexander Aures, Matías Zilly, Kiril Velkov, Winfried Zwermann
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
Han Gyu Joo
Seoul National University
- P257** Simulation of the BEAVRS Benchmark using VERA¹
Benjamin S. Collins¹, Andrew Godfrey¹, Shane Stimpson¹, Scott Palmtag²
¹Oak Ridge National Laboratory, ²Core Physics, Inc.
- P262** Core Follow Calculation for a VVER-1000 Reactor in Cycles 1 through 6 using DeCART2D/MASTER
Cheon Bo Shim*, Jin Young Cho, and Kyung Hoon Lee
Korea Atomic Energy Research Institute
- P271** Quasi-static Analysis of VHTR Core using Neutronics/Thermo-fluid Coupled CAPP/GAMMA+ Code System
Jun-Kyung Jang¹, Ho-Chul Lee¹, Nam-il Tak², Hyun Chul Lee^{1,*}
¹Pusan National University
²Korea Atomic Energy Research Institute
- P276** Nonlinear Analysis for Control of Xenon Oscillations using Sigmoid Functions
Abhishek Chakraborty¹, Suneet Singh²
¹Nuclear Power Corporation of India Limited
²IIT Bombay

- P315** SCALE Multi-Group Libraries for Sodium-cooled Fast Reactor Systems
Friederike Bostelmann^{1,3}, Nicholas R. Brown², Andreas Pautz³, Bradley T. Rearden⁴, Kiril Velkov¹, Winfried Zwermann¹
¹Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH
²Pennsylvania State University
³École polytechnique fédérale de Lausanne
⁴Oak Ridge National Laboratory
- P317** Molten Salt Reactor Simulation Capability Using MPACT
Benjamin Collins, Cole Gentry, Shane Stimpson
Oak Ridge National Laboratory
- P320** Automate Multigroup Cross Section Library Verification Using Eigenvalue Analysis
Yuxuan Liu¹ and Kaiwen Li²
¹University of Michigan ²Tsinghua University
- P324** Extended Radial Reflector Modeling Capabilities in MPACT
S. Stimpson¹, B. Collins¹, A. Godfrey¹, F. Franceschini², D. Salazar²
¹Oak Ridge National Laboratory
²Westinghouse Electric Co. LLC
- P412** Application of GMDH to Cross Section Functionalization
Seongpil Yum¹, Ho Cheol Shin², Minyong Park¹, Jiwon Choe¹, Peng Zhang¹, and Deokjung Lee^{1,*}
¹Ulsan National Institute of Science and Technology
²Core and Fuel Analysis Group,
- P347** A coupled neutronics and thermal-hydraulics modeling approach to the steady-state and dynamic behavior of MSRs
Tianliang Hu, Liangzhi Cao, Hongchun Wu, Kun Zhuang
Xi'an Jiaotong University
- P361** Implicit Local Void Model for Cross Section Generation in the APOLLO2-A - ARTEMISTM BWR Core Simulator Methodology
Alexander Bennett¹, Nicolas Martin², Maria Avramova¹
¹North Carolina State University, ²AREVA Inc.
- P404** Imaging of Shielded Uranium Assemblies Under Active Neutron Interrogation Using Inverse Methods
Aaron B. Nowack¹, Seth M. McConchie², Jason P. Hayward^{1,2}
¹The University of Tennessee,
²Oak Ridge National Laboratory
- P411** Inverse Estimation of Unknown Radioactive Source using Detection Probability and Adjoint Calculation
Shinji Sugaya, Tomohiro Endo, Akio Yamamoto
Nagoya University

Poster Session [PS5]

3F Lobby

April 17 (Mon), 18:00 - 20:00

TH/Material/Fusion

Chair Han Gyu Joo (SNU)

- P325** CFD Simulation of a 61-pin Wire-wrapped Fuel Subassembly for Sodium Cooled Fast Reactor
Jing Chen*, Dalin Zhang, Xinan Wang, Suizheng Qiu, G.H. Su, Yapei Zhang
Xi'an Jiaotong University
- P333** Identification of Vortical Flow Pattern inside PWR Fuel Assembly
Gong Hee Lee
Korea Institute of Nuclear Safety, University of Science and Technology, Ae Ju Cheong
Korea Institute of Nuclear Safety

- P335** Transient Characteristic Analysis of Nuclear Metallic Fuel System
Zhang Chi, Zhou Qi, Zhang Geng, Xia Zhaodong, Zhu Qingfu
China Institute of Atomic Energy
- P373** Retention of Radionuclides in Heavy Liquid Metal Coolants for Mechanistic Source Term Analysis
Ishita Trivedi¹, James Sienicki², Matthew Bucknor², Kostadin Ivanov¹
¹*North Carolina State University*
²*Argonne National Laboratory*
- P379** Computational Magnetohydrodynamics Using the deal.II Finite Element Library
K.S. Han, B.H. Park, and A.Y. Aydemir
National Fusion Research Institute
- P385** Parameter dependency of pinch in toroidal momentum transport of tokamaks
S.M. Yang, D.H. Na and Yong-Su Na
Seoul National University
- P386** Operation scenario modeling of non-activation phase in ITER
C. S. Byun and Y. S. Na
Seoul National University
- P387** Coupling of Mesh Generator Code (VEGA) to Two-dimensional Tokamak Plasma Transport Code (C2)
J. G. Lee and Yong-Su Na*
Seoul National University