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- 996 Multiphysics Analysis of the MSRE Experiment Using Griffin-SAM Coupled Code System—*Mustafa Jaradat (INL), Javier Ortensi (INL), Gang Yang (ANL), Rui Hu (ANL), Ling Zou (ANL)*

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- 1007 Optimization of Burnable Poison Pattern Design in a Westinghouse Fuel Lattice—*Oluwaseun Fetuata (TAMU, Kingsville), Xue Yang (TAMU, Kingsville)*
- 1011 Preliminary Comparison of Depletion and Fuel Management Software for the MIT Research Reactor—*Maurane Garanzini (MIT), Kyle Anderson (ANL), Valerio Mascolino (ANL), Lin-wen Hu (MIT), Erik Wilson (ANL)*
- 1015 Failure Analysis of TRISO Fuel in a Heat Pipe Microreactor—*Nicholas J. Fassino (ANL), Yinbin Miao (ANL), Kun Mo (ANL), Nicolas E. Stauff (ANL)*

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- 1026 Preliminary Radiation Shielding and Waste Assessment Study of High Temperature Gas Cooled Reactor—*Anna Kudriavtseva (MIT), Koroush Shirvan (MIT)*
- 1030 Gamma and Neutron Shielding Characterization of Novel Geopolymer Materials—*Jianxin Zhou (Univ. Illinois, Urbana-Champaign), Alexander Fields (Univ. Illinois, Urbana-Champaign), Markus Tam (Univ. Illinois, Urbana-Champaign), Ali Ozer (Univ. Illinois, Urbana-Champaign), Waltraud M. Kriven (Univ. Illinois, Urbana-Champaign), Angela Di Fulvio (Univ. Illinois, Urbana-Champaign)*
- 1034 MCNP6.3 Electron Energy Deposition Validation with the Lockwood Experiments—*Joel A. Kulesza (LANL)*
- 1038 Comparison of Measured and Calculated Dose Rates for Ring Injection Dump Exchange at Spallation Neutron Source—*I. I. Popova (ORNL), F.X. Gallmeier (ORNL), C. Elam (ORNL), R. Schultz (ORNL)*

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- 1051 Neutronics Models for Evaluating Shielding in the SPARC Fusion Facility—*Joshua T. Jones (MPR Assoc.), James M. Burke (MPR Assoc.), Andrew Cooper (Silver Fir Software), Andrea A. Saltos (Commonwealth Fusion Systems), Ryanne Kennedy (MPR Assoc.)*
- 1055 VERA Extensions for Advanced LWR Excore Radiation Transport Applications—*Andrew Godfrey (Veracity Nuclear), Benjamin Collins (Veracity Nuclear), Micah Best (TAMU)*

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- 1070 Computational Fluid Dynamics Heat Transfer Sensitivity Analysis for Hollow Wire Wrap Capillaries Instrumented with Optical Fiber Temperature Sensors—*Stefan Vietz (Oregon State), Guillaume Mignot (Oregon State), Trevor Kent Howard (Oregon State), Wade Marcum (Oregon State)*
- 1074 Flow Analysis Through a Packed Bed with Unsteady Reynolds Averaged Navier-Stokes Equations (URANS)—*David Lanade (TAMU), Octavio Bovati (TAMU), Yassin Hassan (TAMU)*
- 1078 Modeling and Validation of Two-Phase Boiling Flow and Critical Heat Flux with the STAR-CCM+ CFD Code—*Prasad Vegendla (ANL), Adrian Tentner (ANL)*

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- 1084 RANS Simulation of a Porous Blockage in a 61-Pin Wire-Wrapped Bundle—*Octavio Bovati (TAMU), Yassin Hassan (TAMU)*
- 1088 Comparison of RANS and LES Simulations of a Gas-Cooled Pebble Bed with 1568 Pebbles—*Dezhi Dai (ANL), Prasad Vegendla (ANL), Haomin Yuan (ANL), John Acierno (ANL), Adrian Tentner (ANL)*

1093 Young Professional Thermal Hydraulics Research Competition: I

- 1094 Accelerated Prediction of Loss-of-Component-Cooling-Water (LOCCW) Accident Progression—*Semin Joo (KAIST), Yeonha Lee (KAIST), Seok Ho Song (KAIST), Jeong Ik Lee (KAIST)*
- 1098 A Comprehensive Uncertainty Quantification Study of the Conventional and Machine Learning Based CHF Models—*Congshan Mao (Univ. Missouri), Yue Jin (Univ. Missouri)*
- 1102 Estimating Field Variables from Limited Measurements Using Spectral Theory Projection Methods—*John Matulis (Purdue), Hitesh Bindra (Purdue)*
- 1106 Two Phase Boiling in a Reactor Cavity Cooling System Under Throttling Conditions—*Matthew J. Jasica (ANL), Qiuping Lv (ANL), Darius D. Lisowski (ANL)*

- 1111 Young Professional Thermal Hydraulic Research Competition: II**
- 1112 Identifying Important Parameters Affecting Fuel Dispersion and Relocation Phenomena Under Loss of Coolant Accident (LOCA) Conditions—*Sade Danielle Campos (Oregon State), Trevor Kent Howard (Oregon State), Stephen Yamasaki (Oregon State), Guillaume Mignot (Oregon State), Wade Marcum (Oregon State), Gordon Wissinger (Framatome), Lisa Gerken (Framatome)*
- 1116 Experimental Investigation of Shell Side Flow Around Twisted Tubes Using Positron Emission Particle Tracking for CFD Validation—*Connor Donlan (Virginia Commonwealth Univ.), A. Cabral (Virginia Commonwealth Univ.), C. Wiggins (ORNL), S. Tutwiler (Virginia Commonwealth Univ.), Lane B. Carasik (Virginia Commonwealth Univ.)*
- 1120 Direct Numerical Simulation of a Molten Salt Natural Circulation Loop Using the Spectral Element Method—*Tri Nguyen (Penn State), John Barton (Penn State), Casey Emler (Penn State), Elia Merzari (Penn State)*
- 1125 General Thermal Hydraulics: I**
- 1126 Simulation of Two-Phase Instabilities in Helical Coiled Steam Generator Using MARS-KS—*Seunghwan Oh (KAIST), Doh Hyeon Kim (KAIST), Jeong Ik Lee (KAIST)*
- 1130 Molten Salt Cask Design Using MOOSE Framework for High-Temperature Irradiation Experiment—*Erik Hisahara (Penn State), Berke Yesilada (Penn State), Mahmoud Eltawila (Penn State), William Walters (Penn State), Amanda Johnsen (Penn State), Saya Lee (Penn State)*
- 1134 Numerical Analysis of Novel Plate Type Heat Exchanger with Oval-Twisted Channels—*Kyle Schroeder (Idaho State), Scott Wahlquist (Idaho State), Amir Ali (Idaho State), Ahmed Hamed (INL), Piyush Sabharwal (INL)*
- 1138 Thermal Limits of Standard Vacuum Viewports for Plasma Devices—*Justin Weinmeister (ORNL), Drew Elliott (ORNL)*
- 1143 Experimental Thermal Hydraulics**
- 1144 Solar Salt and Sodium Interaction Studies—*James A. Schneider (TerraPower), Rob Corbin (TerraPower), Pyoungchung Kim (TerraPower), Daniel Eichel (TerraPower)*
- 1148 Flow Regime Identification Using Local Conductivity Measurements and Neural Networks—*Charie Tsoukalas (Purdue), Yang Zhao (Purdue), Mamoru Ishii (Purdue)*
- 1152 Feasibility Test of Fiber Optic Temperature Sensors in Sodium Heat Pipes—*Chris Balbier (Penn State), Nathan Smith (Penn State), Hojong Kim (Penn State), Saya Lee (Penn State)*
- 1157 General Thermal Hydraulics: II**
- 1158 Design Exploration of a Cold-Spray Additive Manufactured Pin-Fin Heat Sinks for Heat Pipe for Microreactors—*Marcus Braatz (Penn State), Erik Hisahara (Penn State), Saya Lee (Penn State)*
- 1162 Sensitivity Study on the Fin Effect of Thermocouple Mounted on the Heated Surface Under Film Boiling Conditions—*Seokbin Seo (INL), Charles P. Folsom (INL), Colby B. Jensen (INL), Robert J. Armstrong (INL)*
- 1165 Air Thermal Hydraulics Analysis in a Horizontal Dual Channel Plenum-To-Plenum Facility Representing Micronuclear Reactors—*Zeyad Zeitoun (Missouri Univ. Science and Technology), Andrew Lazarski (Missouri Univ. Science and Technology), Ahmed Jasim (Missouri Univ. Science and Technology), Muthanna H. Al-Dahhan (Missouri Univ. Science and Technology)*
- 1169 Fabrication of Surrogate Rupture Rods for the Replication of Fuel Pin Failure in Liquid Metal Fast Reactors—*Nicholas Gallagher (Oregon State), Guillaume Mignot (Oregon State), Wade Marcum (Oregon State)*
- 1173 Effect of Initial Temperature on Quench Behavior of Cr-Coated Zr-Alloy Cladding—*Cole Dunbar (Univ. Wisconsin, Madison), WooHyun Jung (Univ. Wisconsin, Madison), Nicolas Fox (Univ. Wisconsin, Madison), Thomas Demo (Univ. Wisconsin, Madison), Benjamin Maier (Westinghouse Electric Co.), Robert Armstrong (Univ. Wisconsin, Madison), Kumar Sridharan (Univ. Wisconsin, Madison), Michael Corradini (Univ. Wisconsin, Madison), Hwasung Yeom (Pohang Univ. Science and Technology)*
- 1177 Computational Thermal Hydraulics: I**
- 1178 Numerical Study on Effect of Thermal Bowing on Peak Cladding Temperature of MARVEL Microreactor—*SuJong Yoon (INL), Casey J. Jesse (INL), Carlo Parisi (INL), Yasir Arafat (INL)*
- 1182 GAMMA+ Analysis of Turbulent Natural Convection in a Cavity Using k-e Model—*Seung Hyun Yoon (KAERI), Nam-il Tak (KAERI), Hong Sik Lim (KAERI)*
- 1186 An Explicit Numerical Study of Flow Through Bypass Gaps and Channel in a Pebble Bed Core—*Haomin Yuan (ANL), Dillon Shaver (ANL), Dezhi Dai (ANL), Tri Nyugen (Penn State), Elia Merzari (Penn State), Brian Jackson (Kairos Power), Nate Salpeter (Kairos Power), Ka-Yen Yau (Kairos Power), Giacomo Busco (Kairos Power)*

1190 Sensitivity Analysis for the Validation of 3D Thermal Hydraulics and FEM-Based Nuclear Fuel Performance Coupled Code with ICARUS Experiment—*Seung-Jun Lee (KAERI), Ik Kyu Park (KAERI), Sung Uk Lee (KAERI), Hyo Chan Kim (KAERI)*

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1194 Heat Transfer Model of Liquid Sodium Purification and Diagnostic System for Advanced Reactor Control Applications—*Rita Appiah (Purdue), Alexander Heifetz (ANL), Derek Kultgen (ANL), Lefteri Tsoukalas (Purdue), Richard Vilim (ANL)*

1198 Evaluation of Thermal Conductivity of Chamfer Cylinders in a Pebble Bed Mesh—*Dezhi Dai (ANL), Haomin Yuan (ANL), Prasad Vegendla (ANL), Adrian Tentner (ANL)*

1202 Latest Developments in the MOOSE Fluid Properties Module—*Guillaume L. Giudicelli (INL), Benjamin Spaude (INL), Steven Isaacs (INL), Alexander Lindsay (INL)*

1205 CANDU Fuel Channel Modeling in CTF Within the OECD-NEA Blind Benchmark on CANDU Thermal-Hydraulics—*Daria Bolgova (NCSU), Agustin Abarca (NCSU), Xu Wu (NCSU), Maria Avramova (NCSU)*

1209 Advances in Material Science and Thermal Hydraulics for Lead Cooled Fast Reactors: I

1210 Pre-Test Simulation in Support of a Deformed Rod Bundle Experiment—*F. Roelofs (NRG), P. Baas (NRG), H. Uitslag-Doolaard (NRG), M. Daubner (KIT), K. Litfin (KIT)*

1214 Overview of State-of-the-Art Experimental Facilities for Westinghouse LFR—*Jun Liao (Westinghouse Electric Co.), Paolo Ferroni (Westinghouse Electric Co.), Cory A. Stansbury (Westinghouse Electric Co.), Karina Assis (Westinghouse Electric Co.), Megan E. Durse (Westinghouse Electric Co.), Emre Tatli (Westinghouse Electric Co.), Asfaq Patel (Westinghouse Electric Co.), Jeff Arndt (Westinghouse Electric Co.), Richard F. Wright (Westinghouse Electric Co.), Paul Barnes (Westinghouse Electric Co.), Fabio Martini (Westinghouse Electric Co.), James Holden (Westinghouse Electric Co.), Sung Jin Lee (Fauske & Assoc.), Mike Epstein (Fauske & Assoc.)*

1218 Experimental Determination of Radionuclide Retention in Gen. IV Lead-Cooled Fast Reactors—*Lukas Metzger (Virginia Tech), Jinsuo Zhang (Virginia Tech)*

1221 Development of Flow-Induced Vibration Experiment on ALFRED Fuel Assembly Mock-Up—*Ivan Di Piazza (ENEA Brasimone), Daniele Martelli (ENEA Brasimone), Giorgio Mongiardini (Univ. di Roma La Sapienza), Mariano Tarantino (ENEA Brasimone), Massimo Valdiserri (ENEA Brasimone), Stefano Cati (ENEA Brasimone)*

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1226 Modeling of Prismatic High Temperature Reactors in Pronghorn—*Vasileios Kyriakopoulos (INL), Mauricio Tano (INL), Sebastian Schunert (INL)*

1230 Simulation of a Postulated Severe Assembly Blockage Accident in a Sodium Fast Reactor with the SAS4A/SASSYS-1 Safety Analysis Code—*Adrian Tentner (ANL), Taeil Kim (ANL)*

1234 CFD Study of Two-Phase Flow in Helical Tube Steam Generator—*Doh Hyeon Kim (KAIST), Seunghwan Oh (KAIST), Jeong Ik Lee (KAIST)*

1238 Simulations of Online Refueling Transients in a Generic Stable Salt Reactor—*Thanh Hua (ANL), Yan Cao (ANL), Luke Godfrey (Moltex Energy), Tom Taylor (Moltex Energy)*

1242 Influence of Containment Design Parameters on Analysis of Depressurized Loss of Forced Cooling of Gas-Cooled Fast Modular Reactor Using MELCOR Code—*WooHyun Jung (Univ. Wisconsin, Madison), SeungKyo Jung (Univ. Wisconsin, Madison), Cole Dunbar (Univ. Wisconsin, Madison), Michael Corradini (Univ. Wisconsin, Madison)*

1247 Advances in Material Science and Thermal Hydraulics for Lead Cooled Fast Reactors: II

1248 Modeling of Corrosion in Lead Fast Reactor Using SAM—*Thanh Hua (ANL), Travis Mui (ANL), Ling Zou (ANL), Rui Hu (ANL), Jun Liao (Westinghouse Electric Co.), Paolo Ferroni (Westinghouse Electric Co.)*

1252 Influence of Proton Irradiation on Corrosion in Liquid Lead—*Weiyue Zhou (MIT), Wande Cairang (MIT), Paola Amadeo (MIT), Kevin B. Woller (MIT), Michael P. Short (MIT)*

1254 Design of a 200 kW Liquid LBE Windowless Target for Neutron Source Development—*Ran Kong (Niowave), Jee Hyun Seong (LANL), Terry Grimm (Niowave), Robert Wahlen (Niowave), Bhavini Singh (LANL), Keith Woloshun (LANL)*

1258 Scaling of Heat Transfer Deterioration Resulting from Fission Gas Ejection in Surrogate Fluids for Liquid Metal Fast Reactors—*Sophia R.S. Jones (Oregon State), Qiao Wu (Oregon State), Trevor K. Howard (Oregon State), Guillaume Mignot (Oregon State), Wade Marcum (Oregon State)*

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