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Current position

2019- *Assistant Professor*, Department of Nuclear Engineering, North Carolina State University

Education

2013 PhD in Nuclear Engineering, The Pennsylvania State University
2010 MSc in Nuclear Engineering, University of Michigan
2008 MSc in Nuclear Engineering, University of Tennessee
2005 BSc in Engineering Physics, Tsinghua University, China

Appointments held

2016-2019 Research Assistant Professor, Department of Nuclear Engineering, North Carolina State University
2014-2015 Postdoctoral Scholar, Department of Nuclear Engineering, University of California, Berkeley
2011 Intern, Energy and Advanced Concepts Group, General Atomics

Publications

JOURNAL ARTICLES

2021 Rivas, A., Stauff, N., Sumner, T., Hou, J. "Propagating neutronic uncertainties for FFTF LOFWOS Test #13," *Nuclear Engineering and Design*, 375, 111047.
2021 Avramova, M., Abarca, A., Hou, J., Ivanov, K. "Innovations in Multi-Physics Methods Development, Validation, and Uncertainty Quantification," *Journal of Nuclear Engineering*, 2(1):44-56.
2020 J. Hou, M. Avramova, K. Ivanov, "Best-Estimate Plus Uncertainty Framework for Multiscale, Multiphysics Light Water Reactor Core Analysis," *Science and Technology of Nuclear Installations*, 2020, 7526864.
2020 I. Trivedi, J. Hou, G. Grasso, K. Ivanov, F. Franceschini, "Nuclear Data Uncertainty Quantification and Propagation for Safety Analysis of Lead-cooled Fast Reactors," *Science and Technology of Nuclear Installations*, 2020, 3961095.
2020 M. Altahhan, S. Bhaskar, D. Ziyad, P. Balestra, C. Fiorina, J. Hou, N. Smith, M. Avramova, "Preliminary design and analysis of Liquid Fuel Molten Salt Reactor using multi-physics code GeN-Foam," *Nuclear Engineering and Design*, 369.
2020 C. Wan, Z. Sui, L. Cao, Z. Liu, B. Wang, J. Hou, "Nuclear-data Uncertainty Propagation in Transient Simulation for the C5G7-TD Benchmark Problem," *Annals of Nuclear Energy* 120, 103184.

- 2020 K. Zeng, N.E. Stauff, J. Hou, T.K. Kim, "Development of Multi-Objective Core Optimization Framework and Application to Sodium-cooled Fast Test Reactors," *Progress of Nuclear Energy* 140, 107122.
- 2019 K. Zeng, J. Hou, M. Jessee, K. Ivanov, "Uncertainty Quantification and Propagation of Multi-Physics Simulation of the Pressurized Water Reactor Core," *Nuclear Technology*, 205:12, 1618-1637.
- 2019 S. Sihlangu, V. Naicker, J. Hou, F. Reitsma, "Further development of methodology to model TRISO fuel and BISO absorber particles and related uncertainty quantification using SCALE 6," *Journal of Nuclear Science and Technology*, 56:8, 690-709.
- 2018 Q. Li, Y. Jiao, M. Avramova, P. Chen, J. Yu, J. Chen, J. Hou, "Development, verification and application of a new model for active nucleation site density in boiling systems," *Nuclear Engineering and Design*, 328:1-9.
- 2017 J. Hou, K. Ivanov, V. Boyarinov, P. Fomichenko, "OECD/NEA Benchmark for Time-Dependent Neutron Transport Calculations without Spatial Homogenization," *Nuclear Engineering and Design*, 317:177-189.
- 2017 L. Wang, J. Guo, F. Li, J. Hou, K. Ivanov, "Effect of Nuclear Data on Fuel Element Neutronic Characteristics of Pebble-bed High Temperature Gas-cooled Reactor," *Atomic Energy Science and Technology*, 51, 9 (2017). [In Chinese]
- 2016 J. Hou, S. Qvist, R. Kellogg, E. Greenspan, "3D In-core Fuel Management Optimization for Breed-and-Burn Reactors," *Progress in Nuclear Energy*, 88:58-74.
- 2015 S. Qvist, J. Hou, E. Greenspan, "Design and Performance of 2D and 3D-shuffled Breed-and-Burn Cores," *Annals of Nuclear Energy*, 85:93-114.
- 2015 J. Hou, H. Choi, K. Ivanov, "Development of An Iterative Diffusion-Transport Method based on MICROX-2 Cross Section Libraries," *Annals of Nuclear Energy*, 77:335-342.
- 2014 J. Hou, H. Choi, K. Ivanov, "Assessment of MICROX-2 Code with New ENDF/B-VII.0 Master Library," *Nuclear Technology*, 186,3:305-316.
- 2014 J. Hou, H. Choi, K. Ivanov, "Self-shielding Models of MICROX-2 Code: Review and Updates," *Annals of Nuclear Energy*, 64:256-263.

CONFERENCE PROCEEDINGS

- 2020 Y. Xu, J. Hou, K. Ivanov, "Improvement to NEM SP3 Modelling and Simulation," *Proceedings of PHYSOR 2020: Transition to a Scalable Nuclear Future*, Cambridge, UK, Mar 29-Apr 4, 2020.
- 2020 B. Andersen, J. Hou, D. Kropaczek, "Minimizing CRUD Deposition through Optimization of Associated Parameters," *Proceedings of PHYSOR 2020: Transition to a Scalable Nuclear Future*, Cambridge, UK, Mar 29-Apr 4, 2020.
- 2020 K. Ni, J. Hou, M. Avramova, "Implementation and Comparison of Assembly Discontinuity Factors for PROTEUS-MOCEX," *Proceedings of PHYSOR 2020: Transition to a Scalable Nuclear Future*, Cambridge, UK, Mar 29-Apr 4, 2020.
- 2020 M. Avramova, A. Abarca, J. Hou, K. Ivanov, "Innovations in Multi-Physics Methods' Development, Validation, and Uncertainty Quantification," *Proceedings of PHYSOR 2020: Transition to a Scalable Nuclear Future*, Cambridge, UK, Mar 29-Apr 4, 2020.
- 2019 K. Zeng, N. Stauff, J. Hou, "Sensitivity and Uncertainty Analysis of the Advanced Burner Reactor Core Using NEAMS Workbench," *2019 ANS Winter Meeting Transactions*, Washington DC, November 17-21, 2019.
- 2019 M. Avramova, J. Hou, K. Ivanov, "Contributions of Mark Williams to OECD/NEA LWR-UAM Multi-Scale Reactor Physics Framework," *2019 ANS Winter Meeting Transactions*, Washington DC, November 17-21, 2019.
- 2019 K. Zeng, J. Hou, K. Ivanov, "Uncertainty Analysis of Pressurized Water Reactor Core Cycle Depletion Calculation," *2019 ANS Winter Meeting Transactions*, Washington DC, November 17-21, 2019.
- 2019 B. Andersen, D. Kropaczek, J. Hou, "BWR Fuel Bundle Optimization Based on Three-Dimensional Fuel Rods," *2019 ANS Winter Meeting Transactions*, Washington DC, November 17-21, 2019.
- 2019 K. Zeng, J. Hou, K. Ivanov, "Impact of Spatial Coupling Schemes and Perturbation Options on

- Uncertainty Quantification of PWR Core Simulation,” *Proceedings of M&C 2019 Conference* (pp. 2755–2764), Portland, Oregon, Aug 25-29, 2019.
- 2019 J. Hou, C. Maras, C. Gozum, M. Avramova, K. Ivanov, “Comparative Analysis of Solutions of Neutronics Exercises of the LWR UAM Benchmark,” *Proceedings of M&C 2019 Conference* (pp. 2726–2735), Portland, Oregon, Aug 25-29, 2019.
- 2019 I. Trivedi, J. Hou, G. Grasso, K. Ivanov, “Uncertainty Quantification On Feedback and Safety Parameters of Lead-Cooled Fast Reactors,” *Proceedings of M&C 2019 Conference* (pp. 1483–1492), Portland, Oregon, Aug 25-29, 2019.
- 2019 S. Bhaskar, M. Altahhan, P. Balestra, J. Hou, M. Avramova, N. Smith, C. Fiolina, “GeN-Foam 3D Coupled Calculation of Liquid Fuel Molten Salt Reactor Primary Loop,” *Proceedings of NURETH 18*, Portland, Oregon, Aug 18-23, 2019.
- 2019 J. Hou, K. Ni, A. Hawari, “An Artificial Neural Network Based Anomaly Detection Algorithm for Nuclear Power Plants,” *Proceedings of 2019 ANS Annual Meeting*, Minneapolis, MN, June 9-13, 2019.
- 2019 L. Bullerwell, N. Smith, J. Hou, “Design of a Small Modular Molten Salt Reactor,” *Proceedings of 2019 ANS Annual Meeting*, Minneapolis, MN, June 9-13, 2019.
- 2018 M. Altahhan, S. Bhaskar, P. Balestra, J. Hou, M. Avramova, N. Smith, “Advanced Liquid Fuel Molten Salt Reactor Core Simulation Using Gen-Foam,” *Proceedings of Advances in Thermal Hydraulics (ATH 2018)*, Orlando, FL, November 11-15, 2018.
- 2018 M. Altahhan, P. Balestra, J. Hou, M. Avramova, “Implementation of the Multigroup Telegraph Based P₁ Approximation and Comparison to the Multigroup Diffusion Based P₁ Approximation in Gen-Foam,” *Proceedings of PHYTRA4*, Marrakech, Morocco, September 17-19, 2018.
- 2018 S. Bhaskar, M. Altahhan, Devshibhai Ziyad, P. Balestra, J. Hou, M. Avramova, “Modelling and Simulation of a Liquid Fuel Molten Salt Reactor Core Using Gen-Foam,” *Proceedings of PHYTRA4*, Marrakech, Morocco, September 17-19, 2018.
- 2018 Y. Xu, J. Hou, K. Ivanov, “New Implementation of Second-Order Discontinuity Factor for Simplified P₃ Theory in NEM,” *Proceedings of PHYTRA4*, Marrakech, Morocco, September 17-19, 2018.
- 2018 G. Zhang, K. Zeng, N. Stauff, J. Hou, T.K. Kim, T.H. Fanning, “Uncertainty Quantification of ABR Transient Safety Analysis,” *ANS Best Estimate Uncertainty International Conference (BEPU 2018)*, Lucca, Italy, May 13-19, 2018.
- 2018 N.E. Stauff, K. Zeng, G. Zhang, G. Aliberti, J. Hou, T. Fanning, and T. K. Kim, “Uncertainty Quantification of ABR Transient Safety Analysis – Nuclear Data Uncertainties,” *ANS Best Estimate Uncertainty International Conference (BEPU 2018)*, Lucca, Italy, May 13-19, 2018.
- 2018 I. Trivedi, J. Hou, J. Lin, G. Grasso, F. Franceschini, K. Ivanov, “Impact of Nuclear Data Uncertainties on Lead-cooled Fast Reactors,” *ANS Best Estimate Uncertainty International Conference (BEPU 2018)*, Lucca, Italy, May 13-19, 2018.
- 2018 K. Zeng, J. Hou, M. Jessee, K. Ivanov, “Uncertainty Quantification on Pressureized Water Reactor Coupled Core Simulation Using Stochastic Sampling Method,” *ANS Best Estimate Uncertainty International Conference (BEPU 2018)*, Lucca, Italy, May 13-19, 2018.
- 2018 S.F. Sihlangu, V.V. Naicker, J. Hou, F. Reitsma, “Uncertainty Quantification in the MHGTR-350 Fuel Compact and Block Using TSUNAMI-3D Clutch Method and Sampler,” *ANS Best Estimate Uncertainty International Conference (BEPU 2018)*, Lucca, Italy, May 13-19, 2018.
- 2018 Y. Xu, J. Hou, K. Ivanov, “Implementation of Second-Order Discontinuity Factor for Simplified P₃ Theory in NEM,” *PHYSOR 2018: Reactors Physics paving the way towards more efficient systems*, Cancun, Mexico, April 22-26, 2018.
- 2017 K. Zeng, J. Hou, K. Ivanov, and M. Jessee, “Uncertainty Analysis of Light Water Reactor Core Simulations Using Statistic Sampling Method,” *M&C 2017 - International Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering*, Jeju, Korea, April 16-20 2017.
- 2017 J. Hou, K. Ivanov, V. Boyarinov and P. Fomichenko, “C5G7-TD Benchmark for Time-Dependent Heterogeneous Neutron Transport Calculations,” *M&C 2017 - International Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering*, Jeju, Korea, April 16-20 2017.

- 2016 L. Wang, J. Guo, F. Li, J. Hou and K. Ivanov, "Effect of Double Heterogeneity Treatment on Neutronics Modeling of HTGR Unit Cell," *2016 International Topical Meeting on High Temperature Reactor Technology (HTR2016)*, Las Vegas, NV, Nov 2016.
- 2016 Q. Li, M. Avramova, J. Yu, Y. Jiao and J. Hou, "A new model for active nucleation site density in boiling systems," *International Topical Meeting on Advances in Thermal Hydraulics 2016 (ATH 16)*, New Orleans, LA, June 2016.
- 2016 J. Hou, S. Qvist, R. Kellogg and E. Greenspan, "In-core Fuel Management Optimization for Breed-and-Burn Reactors with 3D Fuel Shuffling," *PHYSOR 2016 - Unifying Theory and Experiments in the 21st Century*, Sun Valley, Idaho, May 2016.
- 2015 J. Hou, S. Qvist and E. Greenspan, "3-D Fuel Shuffling for Reduced Peak Burnup and Increased Uranium Utilization of Breed-and-Burn Reactors," *ICAPP 2015 - Nuclear Innovations for a Low-carbon Future*, Nice, France, May 03-06 2015.
- 2014 J. Hou, F. Heidet, P. Gorman and E. Greenspan, "On Multi-Group Cross Sections for Breed-and-Burn Reactors," *Transaction of the American Nuclear Society*, Anaheim, CA, November 2014.
- 2014 P. Gorman, S. Bogetic, J. Hou, J. E. Seifried, G. Zhang, J. Vujic and E. Greenspan, "Thorium Fuelled Resource-Renewable BWR (RBWR) Design Update," *Transaction of the American Nuclear Society*, Anaheim, CA, November 2014.
- 2014 J. Hou, H. Choi and K. Ivanov, "Development of An Iterative Lattice-Core Coupling Method Based on MICROX-2 Cross Section Libraries," *PHYSOR 2014 - The Role of Reactor Physics Toward a Sustainable Future*, Kyoto, Japan, September 2014.
- 2013 J. Hou, H. Choi and K. Ivanov, "Self-shielding Models of MICROX-2 Code," *Int'l Conference on Mathematics & Computational Methods Applied to Nuclear Science & Engineering*, Sun Valley, Idaho, May 2013.
- 2012 J. Hou, H. Choi and K. Ivanov, "Pin Cell Benchmark Calculations of MICROX-2 Library," *Transaction of the American Nuclear Society*, San Diego, CA, November 2012.
- 2012 J. Hou, H. Choi and K. Ivanov, "MICROX-2 Cross Section Library Generation Based on ENDF/B-VII," *PHYSOR 2012 - Advances in Reactor Physics Linking Research, Industry, and Education*, Knoxville, Tennessee, April 2012.
- 2008 J. Hou, J. Preston and L. Miller, "Artificial Neural Network for Spectrum Unfolding Bonner Sphere Data," *11th International Conference of Radiation Shielding*, Pine Mountain, GA, May 2008.
- 2007 L. F. Miller, J. Hou, J. McConn, J. Preston and M. Humberstone, "Uncertainty Analysis Methods for Equilibrium Fuel Cycles," *Transaction of the American Nuclear Society*, Boston, MA, June 2007.
- 2007 D. R. Osborne, J. Hou, L. F. Miller and G. Graves, "Development of a Modern Pressurized Water Reactor Simulator: Instrumentation, Design and Data Acquisition," *IEEE Nuclear Science Symposium and Medical Imaging Conference*, Honolulu, HI, October 2007.
- 2007 J. Hou and L. Miller, "Development of Pressurized Water Reactor (PWR) Simulator," *ANS Student Conference*, Corvallis, OR, May 2007.

TECHNICAL REPORT

- 2019 N. Stauff, P. Lartaud, Y.S. Jung, P. Seurin, C.H. Lee, K. Zeng, J. Hou, "Status of the NEAMS and ARC Neutronics Fast Reactor Tools Integration to the NEAMS Workbench," ANL/NEAMS-19/1, September 30, 2019.
- 2019 K. Zeng, J. Hou, "Modeling SFR-UAM Benchmark Using NEAMS Workbench," RDFMG_UAM-SFR, August 2019.
- 2018 M. Altahhan, S. Bhaskar, D. Ziyad, J. Hou, P. Balestra, "NCSU Technical Report for the MSR Design Project," RDFMG_MSRDES/001, April 2018.
- 2018 V. Boyarinov, P. Fomichenko, J. Hou, M. Avramov, K. Ivanov, A. Aures, W. Zwermann and K. Velkov "Deterministic Time-Dependent Neutron Transport Benchmark without Spatial Homogenization (C5G7-TD), Volume II: Dynamics Phase," NEA/NSC 2018.
- 2016 V. Boyarinov, P. Fomichenko, J. Hou, K. Ivanov, A. Aures, W. Zwermann and K. Velkov "Deterministic Time-Dependent Neutron Transport Benchmark without Spatial Homogenization (C5G7-TD), Volume I: Steady State Phase," NEA/NSC 2016.

istic Time-Dependent Neutron Transport Benchmark without Spatial Homogenization (C5G7-TD), Volume I: Kinetics Phase,” NEA/NSC 2016.

- 2014 J. Hou, T. Blyth, N. Porter, M. Avramova, K. Ivanov, E. Royer, E. Sartori, O. Cabellos, H. Feroukhi, and E. Ivanov, “Benchmark for Uncertainty Analysis In Modelling (UAM) for Design, Operation And Safety Analysis of LWRs, Volume II: Specification and Support Data for the Core Cases (Phase II),” NEA/NSC 2014.
- 2015 E. Greenspan, J. Hou, S. Qvist, P. Peterson and T.K. Kim, “A Pebble-Bed Breed and Burn Reactor,” M2NU-13-CA-UCB_-0701-022 Year 1 Annual Report for Project 13-5144, August 2015.
- 2012 J. Hou and H. Choi, “MICROX-2 Cross Section Library Generation Verification Report: User Manual,” General Atomics, February 2012.
- 2011 J. Hou and H. Choi, “MICROX-2 Cross Section Library Generation Verification Report: Method and Test,” General Atomics, August 2011.
- 2009 J. Hou, Y. Xu and T. Downar, “Multi-Cycle Depletion Capacity for PARCS,” NRC-RES-07-115, December 2009.
- 2009 T. Downar, J. Hou, B. Collins and Y. Xu, “Technical Evaluation of the HITACHI Resource-Renewable BWR (RBWR) Design Concept Phase II - Final Report,” September 2009.

Teaching

- 2019 NE 402/502 Reactor Engineering
- 2019-2020 NE 591 Metal Cooled Reactors
- 2018-2020 NE 412/512 Nuclear Fuel Cycle
- 2017-2021 NE 403 Introduction to Nuclear Reactor Laboratory
- 2016-2017 NE 201 Introduction to Nuclear Engineering
- 2016,2018 NE 419 Introduction to Nuclear Energy

Honors & Awards

- 2021 Andy Rivas, National Science Foundation (NSF) Graduate Research Fellowship, 2021.
- 2020 Ishita Trivedi, NC State College of Engineering Doctoral Scholar of the Year, 2020.
- 2019 Best paper, “Core design using PRISM and coupling Formosa to PRISM” in Fuel Cycle and Waste Management category in ANS Student Conference, 2019.
- 2019 Best paper, “Design and optimize Molybdenum-99 production capability” in Isotopes and Radiation category in ANS Student Conference, 2019.
- 2018 Best paper, “Design of a nuclear power system to support an asteroid refinery in space” in Aerospace Nuclear Science & Technology category in ANS Student Conference, 2018.
- 2013 Member, Alpha Nu Sigma of the American Nuclear Society.
- 2005 Zheng Geru Scholarship for Academic Excellence, Tsinghua University.

Relevant professional activities

- 2015- Reviewer, *Nuclear Technology*, *Annals of Nuclear Energy*, *Progress in Nuclear Energy*, *International Journal of Energy Research*, *Energies*, *Nuclear Engineering and Technology*, *Indian Journal of Pure & Applied Physics*.
- 2018 Reviewer, PHYTRA4 – The Fourth International Conference on Physics and Technology of Reactors and Applications. Marrakech, Morocco, September 17-19, 2018.
- 2018 Reviewer, PHYSOR 2018: Reactor Physics Paving the Way towards More Efficient Systems, Cancun, Mexico, April 22-26, 2018.
- 2016 Reviewer, 2016 International Congress on Advances in Nuclear Power Plants (ICAPP 2016), San

Francisco, CA, USA, April 17-20, 2016.
2016 Reviewer, Nuclear Regulatory Committee (NRC) Integrated University Program (IUP) – Scholarship and Fellowship programs, 2016.
2016 Judge, American Nuclear Society Student Design Competition, 2016.
2015 Reviewer, International Conference on Mathematics and Computation ($M\&C$), Nashville, TN, USA, April 19-23, 2015.
2014 CGPSA-Berkeley Sunshine 1+1 Mentorship, Mentor to UC Berkeley Student, 2014.
2006- Member, American Nuclear Society.

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