

Kevin T. Clarno



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Summary

Provides leadership in multi-institutional collaborations to develop and implement nuclear analysis software. Manages agile processes to design, develop, and qualify nuclear software in a regulated environment. Designs and develops algorithms and data analysis for modeling radiation transport on high-performance computing platforms. Provides expertise in nuclear reactor physics, nuclear fuel analysis, isotopic transmutation, and shielding algorithms and analysis. Since 2004, has supported nuclear engineering efforts at Oak Ridge National Laboratory (ORNL), and is also assistant professor at the University of Tennessee-Knoxville as joint faculty member in nuclear engineering. Has led multi-institutional high-performance computing projects at ORNL, including the Consortium for Advanced Simulation of Light Water Reactors (CASL) Physics Integration Focus Area; SCALE Nuclear Analysis Software Modernization; Advanced Multi-Physics (AMP) fuel performance code; and a portfolio of laboratory-directed strategic research projects. As a technical contributor at ORNL, has developed high-performance computing software, SCALE software developer, and nuclear reactor analyst for a diverse set of US Nuclear Regulatory Commission (NRC) and DOE projects.

Education

MBA, Georgia Southern University, Statesboro, Georgia	2015
PhD, Nuclear Engineering, Texas A&M University, College Station, Texas	2004
MS, Nuclear Engineering, Texas A&M University, College Station, Texas	2001
BS, Nuclear Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts	1999

Experience

Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, 2004–Present

Distinguished R&D Staff, Reactor and Nuclear Systems Division (RNSD)	2018–Present
Interim Director, CASL	
Group Leader, Reactor Physics, RNSD	
Senior R&D Staff, RNSD	2010–2017
R&D Staff, Nuclear Science and Technology Division (NSTD)	2007–2010
Associate R&D Staff, NSTD	2004–2007

- As the Physics Integration (PHI) Focus Area lead for CASL, manages the integration, development, and application of the Virtual Environment for Reactor Analysis (VERA) suite of codes to enable the nuclear industry to advance beyond legacy software and overcome long-standing challenges within the industry utilizing leadership-class computing hardware.
- As ORNL Reactor Multiphysics Team Lead, directs nine staff members and students in the development of cutting-edge technologies to provide multi-scale multiphysics algorithms and software for a diverse sponsor base.
- Recently led the modernization of the SCALE nuclear analysis code suite, which provides qualified radiation transport, shielding, and criticality safety tools for regulators and regulated industries throughout the world.
- Served as principal investigator (PI) for a multi-institutional team developing the AMP Nuclear Fuel Performance code, which includes a flexible scientific computing foundation for high-performance computing architectures, for the DOE Office of Nuclear Energy.

- Served as PI for several major ORNL Laboratory-Directed Research and Development (LDRD) and DOE projects, including development of high-performance computing radiation (Boltzmann) transport codes for nuclear reactor simulation and the integration of the NESTLE core simulator with the SCALE nuclear analysis code system.
- With a focus on mentoring the next generation of researchers, has advised 20 students and post-degree researchers and has served on seven masters or doctorate committees at four universities, has instructed a class at the University of Utah, and co-instructed several courses at the University of Tennessee.
- Is actively involved in nuclear fuel and reactor analysis, as well as development and improvements to ORNL nuclear analysis software.
- Has published more than 70 manuscripts in journals, conference proceedings, and technical reports, spanning diverse areas of nuclear science and engineering, including cross section processing, isotopic depletion, fuel performance, reactor analysis, thermal-hydraulics, used fuel disposition, and thermo-chemistry.

University of Tennessee, Nuclear Engineering Department, Knoxville, TN, 2009–Present

Assistant Professor, Joint Faculty Appointment	2013–Present
Adjunct Assistant Professor	2009–2013
Advises and teaches graduate and undergraduate courses in nuclear reactor physics.	

University of Utah, Civil and Environmental Engineering Department, Salt Lake City, UT, 2017

Adjunct Assistant Professor
 Taught graduate and undergraduate courses in nuclear reactor physics.

Bechtel Bettis Atomic Power Laboratory, Pittsburgh, PA 2002–2004

Naval Nuclear Propulsion Fellow, Mechanical, Electrical, Reactor Activity
 Performed software optimization and algorithm development.

Honors and Awards

R&D 100 Award, Virtual Environment for Reactor Applications (VERA)	2016
Oak Ridge National Laboratory (ORNL) Significant Event Awards	2010, 2011, 2016
ORNL Award for Engineering Technology by a Team	2010
ORNL Early Career Engineering Achievement Award	2008
Nuclear Science and Technology Division (of ORNL) Technical Excellence Awards	2005, 2006
Naval Nuclear Propulsion Fellow (now known as the Rickover Fellowship)	2002–2004
Academic All-American Football Award (New England Region)	1997
All-Conference Football (New England Football Conference)	1997–1998

Society and Service Activities

Reactor Methods Track Lead for the Physics of Reactors (PHYSOR) Topical, Cancun, Mexico	2012–2015
Technical Program Co-Chair for the MCD 2015 Topical Meeting, Knoxville, TN	2012–2015
Member, ORNL Nuclear Science & Technology Interaction Program (NSTIP)	2004–2013
ANS Mathematics and Computations Division (MCD) Executive Committee Member	2008–2011
Technical Program Co-Chair for the MCD 2011 Topical Meeting, Rio de Janeiro, Brazil	2009–2011
ANS Reactor Physics Division (RPD) Program Committee Member	2005–2008
Co-founder, Young Professionals at ORNL; now Early Career Professionals	2004–2006
Member, Diversity Improvement Team, EES Directorate of ORNL	2004–2005

Refereed Journal Articles

- S. Stimpson, J. Powers, **K. Clarno**, et al., “Pellet-clad mechanical interaction screening using VERA applied to Watts Bar Unit 1, Cycles 1–3,” *Nuclear Engineering and Design*, **327**, 172–186, 2018.
- S. Stimpson, Y. Liu, B. Collins, **K. Clarno**, “A Lumped Parameter Method of Characteristics Approach and Multigroup Kernels Applied to the Subgroup Self-shielding Calculation in MPACT,” *Nuclear Engineering and Technology*, **49**(6), 1240–1249, 2017.
- B. Kochunas, B. Collins, S. Stimpson, R. Salko, D. Jabaay, A. Graham, Y. Liu, K. Kim, W. Wieselquist, A. Godfrey, **K. Clarno**, et al., “VERA Core Simulator Methodology for Pressurized Water Reactor Cycle Depletion,” *Nucl. Sci. Eng.*, 185(1), 217–231, 2017.
- J. Turner, **K. Clarno**, et al., “The Virtual Environment for Reactor Applications (VERA): Design and architecture,” *Journal of Computational Physics*, **326**, 544–568, 2016.
- S. Hamilton, M. Berrill, **K. Clarno**, et al., “An Assessment of Coupling Algorithms for Nuclear Reactor Core Physics Simulations” *Journal of Computational Physics*, **311**, 241–257, 2016.
- M. Piro, J. Banfield, **K. Clarno**, et al., Corrigendum to “Coupled thermochemical, isotopic evolution and heat transfer simulations in highly irradiated UO₂ nuclear fuel,” *J. Nucl. Matl.* **478**, 375–377, 2016.
- R. Schmidt, K. Belcourt, R. Hooper, R. Pawlowski, **K. Clarno**, et al., “An Approach for Coupled-Code Multiphysics Core Simulations from a Common Input,” *Annals of Nuclear Energy*, **84**, 140–152, 2015.
- B. Philip, M. Berrill, S. Allu, S. Hamilton, R. Sampath, **K. Clarno**, and G. Dilts, “A Parallel Multi-Domain Solution Methodology Applied to Nonlinear Thermal Transport Problems in Nuclear Fuel Pins,” *Journal of Computational Physics*, **286**, 143–171, Apr 2015.
- A. Phillippe, **K. Clarno**, et al., “A Validation Study of Pin Heat Transfer for MOX Fuel Based on the IFA-597 Experiments,” *Nucl. Sci. Eng.* **178**(2), 2014.
- A. Phillippe, **K. Clarno**, et al., “A Validation Study of Pin Heat Transfer for UO₂ Fuel Based on the IFA-432 Experiments,” *Nucl. Sci. Eng.* **177**(3), 2014.
- M. Piro, J. Banfield, **K. Clarno**, et al., “Coupled thermochemical, isotopic evolution and heat transfer simulations in highly irradiated UO₂ nuclear fuel,” *J. Nucl. Matl.* **441**, 240–251, 2013.
- K. Clarno** et al., “The AMP (Advanced MultiPhysics) Nuclear Fuel Performance Code,” *Nucl. Eng. Design* **252**(1), 108–120, Nov 2012.
- G. Yesilyurt, **K. Clarno**, et al., “C5 Benchmark Problem with Discrete Ordinate Radiation Transport Code Denovo,” *Nucl. Sci. Eng.* **176**(2), 274–283, Nov 2011.
- T. Evans, **K. Clarno**, and J. Morel, “A Transport Acceleration Scheme for Multigroup Discrete Ordinates with Upscattering,” *Nucl. Sci. Eng.* **165**(3), 292–304 (2010).
- T. Evans, A. S. Stafford, and **K. Clarno**, “Denovo—A New Three-Dimensional Parallel Discrete Ordinates Code in SCALE,” *Nucl. Technol.* **171**(2), 171–200 (2010).
- D. Williams and **K. Clarno**, “Evaluation of Salt Coolants for Reactor Applications,” *Nucl. Technol.* **163**(3), 330–343 (2008).
- Z. Zhong, **K. Clarno**, T. Downar, and M. DeHart, “Implementation of a Two-Level Coarse Mesh Finite Difference Acceleration of an Arbitrary Geometry Two-Dimensional Discrete-Ordinates Transport Method,” *Nucl. Sci. Eng.* **158**(3), 289–298 (2008).
- K. Clarno** and M. Adams, “Capturing the Effects of Unlike Neighbors in Single-Assembly Calculations,” *Nucl. Sci. Eng.* **149**(2), 182–196 (2005).
- K. Clarno** and Y. Hassan, “Development of a RELAP5-3D Multi-dimensional Model of a VVER-1000 NPP for Analysis of a LB LOCA,” *Nucl. Technol.* **141**(2), 142–156 (2003).

Technical Reports

- S. Stimpson, **K. Clarno**, et al, “Demonstration of Coupled Tiamat Quarter Core Calculations on Watts Bar Unit 1, Cycle 1,” ORNL Report ORNL/SR-2017/463, Sep 2017.
- K. Clarno**, et al, “Software Quality Assurance and Verification for the MPACT Library Generation Process,” ORNL Report ORNL/TM-2017/247, May 2017.
- K. Kim, **K. Clarno**, et al, “Development of the V4.2m5 and V5.0m0 Multigroup Cross Section Libraries for MPACT for PWR and BWR,” ORNL Report ORNL/TM-2017/95, Mar 2017.
- M. Jessee, D. Wiarda, **K. Clarno**, et al, “Development and Maintenance of SCALE Lattice and Reactor Physics Capabilities,” ORNL Report ORNL/LTR-2016/585, Sep 2016.
- S. Stimpson, B. Collins, **K. Clarno**, et al, “MPACT Subgroup Self-Shielding Efficiency Improvements,” ORNL Report ORNL/TM-2016/407, Sep 2016.
- T. Downar, et al, “MPACT Theory Manual, Version 2.2.0,” ORNL Report ORNL/TM-2016/476, Aug 2016.
- M. Jessee, D. Wiarda, **K. Clarno**, et al, “TRITON: A Multipurpose Transport, Depletion, and Sensitivity and Uncertainty Analysis Module,” ORNL Report ORNL/TM-2016/56, Apr 2016.
- S. Stimpson, **K. Clarno**, et al, “Standalone BISON Fuel Performance Results for Watts Bar Unit 1, Cycles 1–3,” ORNL Report ORNL/TM-2015/776, Apr 2016.
- M. Williams, “XSPROC: The Cross Section Processing Module for SCALE,” ORNL Report ORNL/TM-2015/721 Apr 2016.
- K. Clarno**, “Determine Operating Reactor to Use for the 2016 PCI Level 1 Milestone,” ORNL Report ORNL/SPR-2016/38, Feb 2016.
- K. Clarno**, et al, “T0002 SCALE Neutronics Updates for Reactor and Spent Fuel Analyses Task 6: SCALE/TRITON Acceleration,” ORNL Report ORNL/LTR-2016/35, Jan 2016.
- S. Stimpson, **K. Clarno**, et al, “Executing BISON-CASL Using VERA-CS Output,” ORNL Report ORNL/SPR-2015/609, Dec 2015.
- S. Bowman, **K. Clarno**, et al, “SCALE Support for Reactor and Spent Fuel Analyses,” ORNL Report ORNL/SPR-2015/572, Oct 2015.
- M. Jessee, U. Mertyurek, **K. Clarno**, S. Bowman, *SCALE Neutronics Updates for Reactor and Spent Fuel Analyses*, ORNL/LTR-2014/517, Oct 2014.
- R. Pawlowski, **K. Clarno**, R. Montgomery, *Demonstrate Integrated VERA-CS for the PCI Challenge Problem*, CASL-I-2014-0153-000, Aug 2014.
- S. Palmtag, et al, *Demonstration of Neutronics Coupled to Thermal-Hydraulics for a Full-Core Problem using VERA*, CASL-U-2013-0196-000, Dec 2013.
- B. Rearden, **K. Clarno**, et al, *Report on Used Nuclear Fuel Characterization Enhancements in SCALE*, ORNL/LTR-2013/425, Oct 2013.
- S. Palmtag, et al, *Coupled Single Assembly Solution with VERA (Problem 6)*, CASL-U-2013-0150-000, Jul 2013.
- S. Hayes and **K. Clarno**, *Fuels IPSC Software Quality Assurance Plan V1.2.2*, LLNL-TM-493620, Nuclear Energy Advanced Modeling and Simulation (NEAMS) Program, Sep 22, 2011.
- A. Phillippe, L. Ott, **K. Clarno**, and J. Banfield, *Analysis of the IFA-432, IFA-597, and IFA-597 MOX Fuel Performance Experiments by FRAPCON-3,4*, ORNL/TM-2012/195, Oak Ridge National Laboratory, Oak Ridge, TN, Aug 2012.
- K. Clarno** and R. Howard, *Problem Specification for FY12 Modeling of Used Nuclear Fuel during Extended Storage*, ORNL/TM-2012/80, Oak Ridge National Laboratory, Oak Ridge, TN, Feb 2012.
- K. Clarno** et al., *Integrated Radiation Transport and Nuclear Fuel Performance for Assembly-Level Simulations*, ORNL/TM-2012/33, Oak Ridge National Laboratory, Oak Ridge, Tenn., Jan 2012.
- B. Philip, **K. Clarno**, and W. Cochran, *Software Design Document for the AMP Nuclear Fuel Performance Code*, ORNL/TM-2010/34, Oak Ridge National Laboratory, Oak Ridge, TN, Mar 2010.
- R. Schmidt, K. Belcourt, **K. Clarno** et al., *Foundational Development of an Advanced Nuclear Reactor Integrated Safety Code*, SAND2010-0878, Sandia National Laboratories, Albuquerque, NM, 2010.
- K. Clarno** and J. Renier, *Test Problem #3: 2009 Three-Dimensional Boiling Water Reactor Simulations*, ORNL/TM-2009/250, Oak Ridge National Laboratory, Oak Ridge, Tenn., Oct 2009.

- T. Evans and **K. Clarno**, *C++ Coding Standards for the AMP Project*, ORNL/TM-2009/240, Oak Ridge National Laboratory, Oak Ridge, TN, Oct 2009.
- K. Clarno**, J. Turner, and G. Hansen, *Roadmap to an Engineering-Scale Nuclear Fuel Performance and Safety Code*, ORNL/TM-2009/233, Oak Ridge National Laboratory, Oak Ridge, TN, Sep 2009.
- R. Primm III, **K. Clarno**, et al., *Design Study for a Low-Enriched Uranium Core for the High Flux Isotope Reactor, Annual Report for the FY 2006*, ORNL/TM-2006/136, Oak Ridge National Laboratory, Oak Ridge, TN, Oct 2006.
- D. Williams, L. Toth, and **K. Clarno**, *Assessment of Candidate Molten Salt Coolants for the Advanced High Temperature Reactor (AHTR)*, ORNL/TM-2006/12, Oak Ridge National Laboratory, Oak Ridge, TN, Mar 2006.
- D. Ingersoll, **K. Clarno**, C. Forsberg, J. Gehin, R. Christensen, C. Davis, G. Hawkes, J. Sterbentz, T. Kim, T. Taiwo, and W. Yang, *Status of Physics and Safety Analyses for the Liquid-Salt-Cooled Very High-Temperature Reactor (LS-VHTR)*, ORNL/TM-2005/218, Oak Ridge National Laboratory, Oak Ridge, TN, Dec 2005.
- D. Ingersoll, **K. Clarno** et al., *Trade Studies for the Liquid-Salt-Cooled Very High-Temperature Reactor: Fiscal Year 2006 Progress Report*, ORNL/TM-2006/140, Oak Ridge National Laboratory, Oak Ridge, TN, Feb 2007.
- K. Clarno**, "TXYPL – TXY with General Anisotropic Scattering," Bechtel Bettis Atomic Power Laboratory Internal Letter, B-MER(ACRE)-59 and Attachment, Jul 2003.

Refereed Conference Proceedings

- J. Powers, S. Stimpson, **K. Clarno**, et al., “Demonstration of Fully Coupled Multiphysics Simulations for Watts Bar Unit 1,” *Proceedings of the 2017 Water Reactor Fuel Performance Meeting (WRFPM 2017)* Sep 2017.
- S. Stimpson, **K. Clarno**, et al., “Effect of Clad Fast Neutron Flux Distribution on Quarter-Core BISON Fuel Performance Calculations,” *2017 Water Reactor Fuel Performance Meeting*, Sep 2017.
- K. Kim, M. Williams, D. Wiarda, **K. Clarno**, et al., “Development of the CASL-VERA V4.2m5 MPACT 51-group Libraries for ENDF/B-VII.0 and VII.1,” *M&C International Conference on Mathematics & Computational Methods Applied to Nuclear Science and Engineering*, South Korea, Apr 2017.
- S. Stimpson, Y. Liu, B. Collins, **K. Clarno**, “A Multigroup, Lumped Parameter MOC Method for Subgroup Self-Shielding in MPACT,” *M&C International Conference on Mathematics & Computational Methods Applied to Nuclear Science and Engineering*, South Korea, Apr 2017.
- S. Stimpson, **K. Clarno**, et al., “Assessing Pellet-Clad Interaction with VERA: WBN1, Cycles 6–7,” *Top Fuel*, Boise, ID, Sep 2016.
- B. Collins, R. Salko, S. Stimpson, **K. Clarno**, et al., “Simulation of CRUD Induced Power Shift Using the VERA Core Simulator and MAMBA,” *PHYSOR 2016*, Sun Valley, ID, May 2016.
- A. Godfrey, **K. Clarno**, et al., “VERA Benchmarking Results for Watts Bar Nuclear Plant Unit 1 Cycles 1–12,” *PHYSOR 2016*, Sun Valley, ID, May 2016.
- S. Stimpson, J. Powers, **K. Clarno**, et al., “Assessment of Pellet-Clad Interaction Indicators in Watts Bar Unit 1, Cycles 1–3 Using VERA,” *PHYSOR 2016*, Sun Valley, ID, May 2016.
- B. Rearden, K. Bekar, C. Celik, **K. Clarno**, “Criticality Safety Enhancements for SCALE 6.2 and Beyond,” *ICNC 2015*, Charlotte, NC, Sep 2015.
- A. Toth, C. Kelly, S. Slattery, S. Hamilton, **K. Clarno**, and R. Pawlowski, “Analysis of Anderson Acceleration on a Simplified Neutronics/Thermal Hydraulics System,” *Joint International Conference on Mathematics and Computation (M&C 2015), Supercomputing in Nuclear Applications (SNA-2015) and Monte Carlo Methods (MC-2015)*, Nashville, TN, Apr 2015.
- B. Rearden, R. Lefebvre, J. Lefebvre, **K. Clarno**, et al., “Modernization Strategies for SCALE-6.2,” *Joint International Conference on Mathematics and Computation (M&C 2015), Supercomputing in Nuclear Applications (SNA-2015) and Monte Carlo Methods (MC-2015)*, Nashville, TN, Apr 2015.
- K. Clarno**, R. Pawlowski, R. Montgomery, T. Evans, B. Collins, B. Kochunas, D. Gaston, and J. Turner, “High-Fidelity Modeling of Pellet-Clad Interaction using the CASL Virtual Environment for Reactor Analysis” *Joint International Conference on Mathematics and Computation (M&C 2015), Supercomputing in Nuclear Applications (SNA-2015) and Monte Carlo Methods (MC-2015)*, Nashville, TN, Apr 2015.
- R. Pawlowski, **K. Clarno**, R. Montgomery, R. Salko, T. Evans, J. Turner, and D. Gaston, “Design of a High-Fidelity Core Simulator for Analysis of Pellet-Clad Interaction,” *Joint International Conference on Mathematics and Computation (M&C 2015), Supercomputing in Nuclear Applications (SNA-2015) and Monte Carlo Methods (MC-2015)*, Nashville, TN, Apr 2015.
- B. Kochunas, B. Collins, D. Jabaay, S. Stimpson, **K. Clarno**, S. Palmtag, T. Downar, and J. Gehin, “VERA Core Simulator Methodology for PWR Cycle Depletion,” *Joint International Conference on Mathematics and Computation (M&C 2015), Supercomputing in Nuclear Applications (SNA-2015) and Monte Carlo Methods (MC-2015)*, Nashville, TN, Apr 2015.
- S. Palmtag, **K. Clarno**, et al., “Coupled Neutronics and Thermal-Hydraulics Solutions of a Full-Core PWR Using VERA-CS,” *PHYSOR 2014 – The Role of Reactor Physics toward a Sustainable Future (PHYSOR-2014)*, Kyoto, Japan, Sep 2014.
- S. Hamilton, **K. Clarno**, et al., “Multiphysics Simulations for LWR Analyses,” *International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2013)*, Sun Valley, ID, May 2013.

- J. Hansel, J. Ragusa, S. Allu, M. Berrill, **K. Clarno**, "Analysis of Physics-Based Preconditioning for Single-Phase Subchannel Equations," *International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2013)*, Sun Valley, ID, May 2013.
- Y. Yong, et al., "Observation and Mechanism of Hydride in Zircaloy-4 and Local Hydride Re-orientation Induced by High Pressure at High Temperature," *International High-Level Radioactive Waste Management, Albuquerque, NM*, May 2013.
- B. Radhakrishnan, S. Gorti, Y. Yong, **K. Clarno**, "Phase Field Simulations of Hydride Reorientation in Zircalloys," *International High-Level Radioactive Waste Management, Albuquerque, NM*, May 2013.
- S. Hamilton, **K. Clarno**, B. Philip, M. Berrill, R. Sampath, and S. Allu, "Integrated Radiation Transport and Nuclear Fuel Performance for Assembly-Level Simulations," *PHYSOR 2012—Advances in Reactor Physics—Linking Research, Industry, and Education*, Knoxville, Tenn., Apr 15–20, 2012, on CD-ROM, American Nuclear Society, LaGrange, Park, IL, 2012.
- G. Yesilyurt, **K. Clarno**, I. C. Gauld, and J. D. Galloway, "Modular ORIGEN-S for Multi-Physics Code Systems," *Proceedings of the Mathematics and Computations Division of the American Nuclear Society Topical Meeting (M&C-2011)*, May 2011.
- K. Clarno**, "Parallel (Sn) Transport Algorithm in NEWTRNX," *Proceedings of Reactor Physics Division of the American Nuclear Society Topical Meeting (PHYSOR 2008)*, Sep 2008.
- S. Vilkomir, W. Swain, J. Poore, and **K. Clarno**, "Modeling Input Space for Testing Scientific Computational Software: A Case Study," *Proceedings of the International Conference on Computational Science (ICCS-2008)*, Jun 2008.
- B. Ganapol, **K. Clarno**, and S. Hamilton, "An Embedded Semi-Analytical Benchmark with Iterative Interpolation for Neutron Transport Methods Verification," *Proceedings of the Joint Supercomputing in Nuclear Applications and Mathematics and Computations Division of the American Nuclear Society Topical Meeting (SNA/M&C-2007)*, Apr 2007.
- M. Williams, J. Gehin, and **K. Clarno**, "Sensitivity Analysis of Reactivity Responses Using One-Dimensional Discrete Ordinates and Three-Dimensional Monte Carlo Methods," *Proceedings of Reactor Physics Division of the American Nuclear Society Topical Meeting (PHYSOR-2006)*, Sep 2006.
- Z. Zhong, T. Downar, M. DeHart, and **K. Clarno**, "Coarse Mesh Finite Difference Acceleration in the Two-Dimensional Discrete Ordinates Transport Calculation," *Proceedings of Reactor Physics Division of the American Nuclear Society Topical Meeting (PHYSOR 2006)*, Sep 2006.
- K. Clarno** and J. Gehin, "Physics Analysis of the LS-VHTR: Salt Coolant and Fuel Block Design," *Proceedings of Reactor Physics Division of the American Nuclear Society Topical Meeting (PHYSOR 2006)*, Sep 2006.
- K. Clarno**, V. de Almeida, E. D’Azevedo, C. de Oliveira, and S. Hamilton, "GNES-R: Global Nuclear Energy Simulator for Reactors, Task 1: High-Fidelity Neutron Transport," *Proceedings of Reactor Physics Division of the American Nuclear Society Topical Meeting (PHYSOR 2006)*, Sep 2006.
- C. Forsberg and **K. Clarno**, "The Advanced High-Temperature Reactor (AHTR): Flux Distribution and Dosimetry," *Proceedings of the International Symposium on Reactor Dosimetry (ISR-2005)*, May 2005.
- D. Williams and **K. Clarno**, "Salt Selection for the LS-VHTR," *Proceedings of the International Congress on Advances in Nuclear Power Plants (ICAPP 2006)*, Jun 2006.
- K. Clarno** and M. Adams, "Capturing the Effects of Unlike Neighbors in Single-Assembly Calculations," *Proceedings of the Mathematics and Computations Division of the American Nuclear Society Topical Meeting (M&C-2003)*, Apr 2003.
- K. Clarno** and M. Adams, "Improved Boundary Conditions for Assembly-Level Transport Codes," *Proceedings of Reactor Physics Division of the American Nuclear Society Topical Meeting (PHYSOR 2002)*, Sep 2002.

Conference Summaries

- B. Rearden, **K. Clarno**, et al, “Criticality Safety Enhancements for SCALE-6.2 and Beyond,” *International Conference on Nuclear Criticality Safety (ICNC-2015)*, Charlotte, NC, Sep 2015.
- K. Clarno**, M. Berrill, S. Hamilton, R. Pawlowski, J. Turner, “Advanced Coupling Explorations for Parallel Coupled Neutronic and Thermal-Hydraulic Simulation,” *SIAM Conference on Parallel Processing*, Portland, OR, Feb 2014.
- R. Pawlowski, et al, “Code Integration Strategies for Large-Scale Reactor Simulation,” *SIAM Conference on Parallel Processing*, Portland, OR, Feb 2014.
- M. Piro, J. Banfield, **K. Clarno**, “Simulation of Thermochemistry and Isotopic Evolution of Irradiated Nuclear Fuel,” *Trans. Am. Nucl. Soc.*, Jun 2013.
- B. Philip, **K. Clarno**, R. Sampath, M. Berrill, S. Allu, G. Dilts, and P. Barai, “The Advanced Multi-Physics (AMP) Package with an Application to Fuel Assemblies in Nuclear Reactors,” 2012 SIAM Annual Meeting, Minneapolis, MN, Jul 9–13, 2012.
- J. Banfield, **K. Clarno**, S. Hamilton, G. I. Maldonado, B. Philip, and M. L. Baird, “Benchmarking of Software and Methods for Use in Transient Multidimensional Fuel Performance with Spatial Reactor Kinetics,” ICAPP ’12, Chicago, IL, Jun 24–28, 2012.
- K. Clarno**, S. Hamilton, B. Philip, R. Sampath, S. Allu, M. Berrill, P. Barai, and J. Banfield, “Integrated Radiation Transport and Thermo-Mechanics Simulation of a PWR Assembly,” *Trans. Am. Nucl. Soc.* **106**, 2012.
- B. Philip, R. Sampath, S. Hamilton, M. Berrill, S. Allu, and **K. Clarno**, “Computational Approach to Nuclear Fuel Assembly Simulation,” *Trans. Am. Nucl. Soc.* **106**, 2012.
- M. Piro, J. Banfield, S. Simunovic, T. Besmann, and **K. Clarno**, “Computational Thermodynamics in the Advanced Multi-Physics Code,” *Trans. Am. Nucl. Soc.* **106**, 1384–1386, 2012.
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- S. Hamilton, **K. Clarno**, B. Philip, R. Sampath, M. Berrill, S. Allu, M. Baird, and J. Banfield, “Coupled Radiation Transport and Thermomechanics Using the AMP and Denovo Codes,” *Twelfth Copper Mountain Conference on Iterative Methods*, Copper Mountain, CO, Mar 25–30, 2012.
- B. Philip, **K. Clarno**, R. Sampath, M. Berrill, S. Allu, and G. Dilts, “The Advanced Multi-Physics (AMP Package),” *Twelfth Copper Mountain Conference on Iterative Methods*, Copper Mountain, CO, Mar 25–30, 2012.
- B. Philip, **K. Clarno**, R. Sampath, M. Berrill, and S. Allu, “A Jacobian Free Newton Krylov Method with Multilevel Block Preconditioning for Multi-Domain Quasistatic Thermomechanics,” *Twelfth Copper Mountain Conference on Iterative Methods*, Copper Mountain, CO, Mar 25–30, 2012.
- J. Banfield et al., “Quasi-Static Validation of the AMP Nuclear Fuel Performance Code,” *Trans. Am. Nucl. Soc.* **104**, Jun 2011.
- P. Barai et al., “Strain-Based Continuum Damage Models for Nuclear Fuels,” *Trans. Am. Nucl. Soc.* **104**, Jun 2011.
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- G. Davidson et al., “Massively Parallel Solutions to the K-Eigenvalue Problem,” *Trans. Am. Nucl. Soc.* **103**, Nov 2010.
- J. Galloway et al., “Generalized Isotopic Tracking Capabilities Within the 3-D BWR Nodal Simulator NESTLE,” *Trans. Am. Nucl. Soc.* **103**, Nov 2010.
- G. Maldonado et al., “Integration of the NESTLE Core Simulator within SCALE,” *Trans. Am. Nucl. Soc.* **100**, Jun 2009.
- Y. Wang et al., “Progress in the Integration of the 2D DG-FEM Sn Transport Solver Xuthus into SCALE,” *Trans. Am. Nucl. Soc.* **99**, Nov 2008.

- T. Greifenkamp, **K. Clarno**, and J. C. Gehin, "Effect of Fuel Temperature Profile on Eigenvalue Calculations," *Proceedings of the 2008 American Nuclear Society Student Conference*, Feb 2008.
- K. Clarno**, "Implementation of Generalized Coarse-Mesh Rebalance in NEWTRNX for Acceleration of Parallel Block Jacobi Transport," *Trans. Am. Nucl. Soc.* **97**, Nov 2007.
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