Computational Reactor Physics: A Perfect Niche Connects Math and Physics

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Abstract
Reactor physics is a niched area in nuclear engineering that predominantly dealing with the neutron physics (i.e. neutronics) aspects of a reactor and its associated components. The principal task in reactor physics is to predict detailed but macro-level neutron behavior in a reactor during both normal operation and abnormal events. Nowadays, these missions are mainly accomplished via numerical modeling and simulation techniques, relying heavily on computer equipment and computational methodologies. Compared to other research areas such as thermal hydraulics and materials science, reactor physics remains as a fundamental, yet intangible, and relatively matured realm in the nuclear engineering discipline; years of accumulated understanding in physics and advancements in mathematics have achieved enormous success in solving many reactor physics problems. However, there are still many interesting problems emerged along with the next generation advance reactor research and development.

Biography
Dr. Zeyun Wu is an Assistant Professor in the Department of Mechanical and Nuclear Engineering at Virginia Commonwealth University (VCU) and is the principal investigator of the Computation Applied Reactor Physics Laboratory (CARPL) at VCU. Prior to VCU,
Dr. Wu is a Lead Nuclear Engineer at National Institute of Standards and Technology (NIST) in charge of a replacement research reactor design project. Dr. Wu received his Bachelor degree from Tsinghua University at Beijing China and Ph.D. degree from Texas A&M University, both in nuclear engineering. Dr. Wu also had a couple of post-doc trainings at the Purdue University and North Carolina State University, respectively. His research interests encompass reactor physics, reactor design and analysis, computational methods on neutron transport and uncertainty and sensitivity analysis for nuclear applications, etc.