FULL CORE MODELING WITH COUPLED MONTE-CARLO CODES

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Abstract. Modeling advanced reactor designs represents a significant challenge to the conventional reactor analysis methods. Monte Carlo (MC) method is perceived as an ideal alternative to accurately model various advanced reactor systems due to the capability of simulating complex core geometries. The advances in computer technology are gradually changing the reactor analysis modeling environment. As a result, MC neutron transport codes are increasingly used as a standard calculation tool in reactor calculations. It is even becoming practical to couple MC neutron transport calculations with depletion and thermal hydraulic (TH) feedbacks to extend the range of applications even further. Many MC-burnup coupling schemes have been developed. This seminar will present coupling methods used in various MC based reactor analysis systems. In particular, the effect of different burnup-TH coupling schemes on the numerical stability and accuracy of coupled MC calculations will be presented. The seminar will focus on the latest development and possible future research pathways.

Biography. Dr. Kotlyar began at Georgia Tech in August 2016. Prior Dr. Kotlyar was a research associate in the Engineering Design Centre at the University of Cambridge, UK. He received his B.Sc. in Engineering in 2008 and PhD in Nuclear Engineering in 2013 from Ben-Gurion University. In 2014, he was elected a Research Fellow at Jesus College, where he contributed to undergraduate teaching and other educational activities.

At the University of Cambridge, his research is focused on the design of inherently safe light water reactors, more specifically, on the investigation of thorium-based fuel cycles for efficient plutonium incineration. His research interests also include development of advanced numerical methods and algorithms for fuel depletion and thermal hydraulic coupled Monte Carlo codes.