LESSONS LEARNED FROM DIRECT CALCULATION OF MEASURED OBSERVABLES IN A MULTIPLYING SUB-CRITICAL SYSTEM

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LANL has performed a series of radiation detection measurements using special nuclear materials (SNM) providing an opportunity to both validate recent improvements in our computational tools and better understand sub-critical multiplication. We have compared MCNP simulations using correlated fission sources and list-mode tally output directly with output of our specialized neutron detectors for a variety of multiplying, sub-critical configurations of WGPu and HEU surrounded by various thicknesses of polyethylene. This talk will review many of the principles involved in such comparisons, summarize our findings, and review our remaining technical questions.

AVNEET SOOD

* LANL in the Applied Physics (X) division for approximately 15 years beginning as a graduate student.
* 2000 finished PhD in Nuclear Engineering at N.C. State University
* Research was developing specific-purpose Monte Carlo codes developed for radiation detection and measurement techniques

* First 10 years at LANL: MCNP code development team
* Responsible for V&V, new physics features, code modernization
* Last 5 years at LANL: Concentration on radiation transport applications
* 2010: Became group leader of radiation transport applications group (XCP-7)
* 2013: Became group leader of a new combined group: Monte Carlo Code development and radiation transport group (XCP-3)