

Technical Meeting on the Compilation of Nuclear Data Experiments for Radiation Characterization

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What we've been up to beyond k-eff at LLNL

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The Nuclear Criticality Safety Division at Lawrence Livermore National Laboratory is developing an extended suite of validation benchmarks for its Monte Carlo code COG. The benchmarks serve to validate nuclear data and to support COG's software quality assurance framework. The current database has 3,395 criticality benchmarks. However, particular focus has been given to including benchmarks that are not criticality experiments. These experiments include β_{eff} , shielding, photoneutron, spectral indices, neutron spectra, subcritical assemblies, Godiva thermo-mechanical behavior after a pulse, time of flight spectra, pulsed neutron die-away in moderators, and pulsed sphere experiments. Many of these benchmarks are reproductions of historical experiments, but some are new experiments that have been conducted at Lawrence Livermore National Laboratory and submitted to international benchmark databases. Here, we present the benchmarks that we are investigating and results on the simulation bias with different computational methods and nuclear data libraries.

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