Abstract Submitted
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Test of Monte Carlo Simulation for MoNA neutron detectors[1] J.E. BOONE, A. WANTZ, W.F. ROGERS, Indiana Wesleyan Univ, N. FRANK, Augustana College, A.N. KUCHERA, Davidson College, S. MOSBY, Los Alamos National Laboratory, M. THOENNESSEN, NSCL/FRIB Michigan State Univ, MONA COLLABORATION — The MoNA (Modular Neutron Array) and LISA (Large multi-Institutional Scintillator Array) detector systems at NSCL are used to determine the energy and trajectory of neutrons decaying from particle-unbound states in exotic neutron-rich nuclei. In order to test the accuracy of simulation (GEANT4 with Menate_R), important for interpreting scattering data from the arrays, an experiment was recently conducted at Los Alamos LANSCE center using 16 MoNA detectors (each consisting of BC408 organic scintillator plastic measuring 200x10x10 cm^3) exposed to a thin, well-characterized neutron beam over a wide energy range in order to observe neutron scattering directly. Neutrons scatter elastically from H and C nuclei and inelastically from C nuclei. Elastic scattering from C (including some inelastic channels) produce light below detector threshold, and therefore constitute "dark scattering," redirecting neutron trajectories without detection, and some inelastic C channels produce additional neutrons in the array. Several features of scattering, including scattering angle, mean distance between scatters, multiplicity, and dark-scatter redirection are analyzed and compared with simulation over a wide range of incoming neutron energy. Results will be presented.

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