Abstract Submitted
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Neutron Scattering Simulations at the University of Kentucky Accelerator Laboratory[1] THIENAN NGUYEN, DANIEL JACKSON, S.F. HICKS, University of Dallas, BEN RICE, J.R. VANHOY, United States Naval Academy — The Monte-Carlo N-Particle Transport code (MCNP) has many applications ranging from radiography to reactor design. It has particle interaction capabilities, making it useful for simulating neutron collisions on surfaces of varying compositions. The neutron flux within the accelerator complex at the University of Kentucky was simulated using MCNP. With it, the complex's capabilities to contain and thermalize 7 MeV neutrons produced via ^{2}H(d,n)^{3}He source reaction to an acceptable level inside the neutron hall and adjoining rooms were analyzed. This will aid in confirming the safety of researchers who are working in the adjacent control room. Additionally, the neutron transport simulation was used to analyze the impact of the collimator copper shielding on various detectors located around the neutron scattering hall. The purpose of this was to attempt to explain any background neutrons that are observed at these detectors. The simulation shows that the complex performs very well with regards to neutron containment and thermalization. Also, the tracking information for the paths taken by the neutrons show that most of the neutrons' lives are spent inside the neutron hall. Finally, the neutron counts were analyzed at the positions of the neutron monitor detectors located at 90 and 45 degrees relative to the incident beam direction.

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