

Abstract Submitted
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Neutron Elastic and Inelastic Scattering Cross Sections for Light and Heavy Nuclei in the 1~20 MeV region in Geant4¹ MICHAEL JONES, UNC, Chapel Hill — Neutron interrogation of cargo containers provides a non-intrusive means of identifying Special Nuclear Materials (SNM) through their resulting spectra. However, before a Monte-Carlo analysis of an interrogation system can be performed, it is essential to validate and confirm the code's ability to correctly simulate and produce these spectra. Using Geant4, a simulation toolkit developed by CERN, the neutron elastic and inelastic scattering cross-sections for light and heavy nuclei in the 1~20 MeV region were calculated. Angle integrated cross-sections were obtained by fitting the angular distributions with Legendre polynomial expansions. The results of these calculations were compared with corresponding experimental data. The analysis showed that the simulations consistently underestimated neutron resulting in large discrepancies in the angle integrated cross-sections for heavier nuclei.

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