

Abstract Submitted
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Cross Section Measurements for Elastic and Inelastic Scattering of Neutrons from Argon and Neon¹ SEAN MACMULLIN, University of North Carolina and Triangle Universities Nuclear Laboratory — Neutron backgrounds are a significant concern to experiments that attempt to directly detect Weakly Interacting Massive Particle (WIMP) dark matter. Recoil nuclei produced by neutron elastic scattering can mimic WIMP signatures. There is insufficient experimental data available for the scattering cross sections of neutrons with noble gases (Ne, Ar, Xe), which are candidate target materials for such experiments. Neutron elastic scattering from argon and neon of natural abundance was investigated at the Triangle Universities Nuclear Laboratory at neutron energies relevant to (α,n) and low-energy spallation neutron backgrounds in these experiments. The differential cross sections were measured using a time-of-flight technique. Partial γ -ray production cross sections for $(n, xn\gamma)$ reactions from 1–30 MeV were also measured at the Los Alamos Neutron Science Center. Details of the experimental techniques and results will be presented.

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