

Abstract Submitted
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Cross-Section Measurements for Elastic and Inelastic Scattering of Neutrons from Noble Gases SEAN MACMULLIN, University of North Carolina and Triangle Universities Nuclear Laboratory (TUNL), MARY KIDD, WERNER TORNOW, CALVIN HOWELL, Duke University and Triangle Universities Nuclear Laboratory (TUNL), MICHAEL BROWN, Morehead State College and Triangle Universities Nuclear Laboratory (TUNL), REYCO HENNING, University of North Carolina and Triangle Universities Nuclear Laboratory (TUNL) — 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 and inelastic scattering from 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-section was measured using a time-of-flight technique at neutron energies of 8.0 and 5.0 MeV. Details of the experimental technique and current status of measurements will be presented.

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