

Muon-Induced Neutron Backgrounds for the COHERENT Germanium CEvNS Experiment

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Ge-mini is a germanium detector subsystem, part of the COHERENT experiment at the Spallation Neutron Source at Oak Ridge National Lab. As a CEvNS experiment, Ge-mini is sensitive to backgrounds from varying sources, mitigated by multiple layers of shielding including High Density Polyethylene (HDPE), copper, and approximately 6 US tons of lead. Since Ge-mini is located at a depth of ~ 8 m.w.e., cosmic muon-induced neutron production is expected at non-negligible rates, due predominantly to muon interaction in the lead shielding. Monte Carlo N-particle Transport (MCNP) code is utilized to simulate the propagation of muon-induced neutrons through Ge-mini's shielding. Results of estimated background rates in the Ge-mini CEvNS signal due to cosmic-induced neutrons will be presented.

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