

Abstract Submitted
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Optimization of Multi-Neutron Detection in a Detector Array using GEANT4¹ DAVID WALTER, Colorado School of Mines — The study of neutron halos in light nuclei requires detection of multiple neutrons in a neutron detector array. This is especially challenging due to “false-positives” induced by crosstalk between detectors. In this work, we report on the development of a crosstalk filter used to efficiently differentiate between the detection of a single neutron inducing crosstalk and multiple (real) neutrons based on timing considerations. The classic method of neutron detection in the MeV range involves elastic scattering interactions with the Hydrogen contained in organic scintillators, either plastic or liquid. To improve the performance of the crosstalk filter, it is possible to take into account the energy loss of the scattered neutrons. In this context, we are also investigating the possibility of using deuterated liquid scintillators, which can potentially provide even better discrimination than normal scintillators. This work is done by simulating the interaction of halo neutrons in various neutron detector configurations using the simulation package GEANT4.

¹Fred Sarazin, Duane Smalley

David Walter
Colorado School of Mines

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