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Simulating the DESCANT Neutron Detection Array with the Geant4 Toolkit[1] JOSEPH TURKO, VINZENZ BILDSTEIN, EVAN RAND, ANDREW MACLEAN, PAUL GARRETT, Univ of Guelph, GRIFFIN COLLABORATION COLLABORATION — The DEuterated SCintillator Array for Neutron Tagging (DESCANT) is a newly developed high-efficiency neutron detection array composed of 70 hexagonal deuterated scintillators. Due to the anisotropic nature of elastic (n,d) scattering, the pulse-height spectra of a deuterated scintillator contains a forward-peaked structure that can be used to determine the energy of the incident neutron without using traditional time-of-flight methods. Simulations of the array are crucial in order to interpret the DESCANT pulse heights, determine the efficiencies of the array, and examine its capabilities for conducting various nuclear decay experiments. To achieve this, we plan: (i) a verification of the low-energy hadronic physics packages in Geant4, (ii) a comparison of simulated spectra with data from a simple cylindrical "test can" detector geometry, (iii) expanding the simulated light response to a prototype DESCANT detector, and (iv) simulating the entire DESCANT array.

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