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Simulation of detector signals in n+^{3}He$\rightarrow$ $p + t$ CHRISTOPHER COPPOLA, Univ of Tennessee, Knoxville, N3HE COLLABORATION — The parity violating proton directional asymmetry from the capture of polarized neutrons on ^{3}He is being measured with a pulsed neutron beam at the Spallation Neutron Source at Oak Ridge National Laboratory. The target is an ion chamber with ^{3}He at approximately half an atmosphere. Signal wires at different locations in the chamber have different sensitivities to the physics asymmetry, which are determined by the geometry and configuration of the experiment. These geometry factors must be determined by simulation. In addition, a simulation can estimate the statistical precision of the experiment, optimize configuration variables, and assist with error analysis. To achieve the most accurate simulation of the detector signals, a custom simulation was written in C++ using weighted variables and taking advantage of parallel execution. The inputs used to construct the simulation came from measurements of the neutron phase space, ENDF cross sections, and PSTAR ionization data. A cell model was used to combine this physics to produce an accurate simulation of the experimental data. This simulation can be used to calculate accurate and tunable geometry factors, and to produce desired quanities for use in optimization and analysis.

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