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Simulation of ion chamber signals in the n+3He $\rightarrow p+t$ experiment CHRISTOPHER COPPOLA, Univ of Tennessee, Knoxville, N3HE COLLABORA-TION — The parity violating proton directional asymmetry from the capture of polarized neutrons on ³He was measured with a pulsed neutron beam at the Spallation Neutron Source at Oak Ridge National Laboratory. The target is an ion chamber with ³He at 0.476 atmosphere. Signal wires in the chamber have different sensitivities to the physics asymmetry, dependent on their location and the the configuration of the experiment. These geometry factors must be determined by simulation. In addition, simulation estimates the statistical precision of the experiment, optimizes configuration variables, and assists with systematic 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 phsyics inputs to the simulation came from measurements of the neutron phase space, ENDF cross sections, and PSTAR ionization data. A cell model was applied 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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