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Geant4 Simulations of the Beam Hadron Monitor for the Long Baseline Neutrino Experiment at Fermilab TIMOTHY WATSON, AMIT BASHYAL, JAEHOON YU, Univ of Texas, Arlington, LONG BASELINE NEUTRINO EXPERIMENT COLLABORATION[1] — Modern research into new physics on the scale of the fundamental constituents of nature often requires multimillion-dollar machines capable of producing high-energy particles and equally expensive detectors sensitive enough to make the desired measurements. Such constructions are necessarily intricate endeavors, complicated by the fact that often the desired experiment demands a very high level of precision. For these reasons, it is prudent to perform computational simulations in order to ensure proper performance of the experiment as well as to anticipate possible sensitive tolerances in construction. To these ends, the de facto standard for the simulation of particle physics remains Geant4. Presented here are the results of simulations for the beamline of the Long Baseline Neutrino Experiment. Specifically outlined are the results of simulations of the beam hadron monitor and the interpretation and application of these simulations for the design considerations of the detector.

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