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NEWS-G3 Muon Background Simulation

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NEWS-G searches for dark matter using spherical proportional counters (SPCs), which are large, gas-filled metal spheres with a small sensor at the centre held at high voltage. SPCs are used to detect the interaction of particles (such as dark matter or neutrinos) in the gas by measuring the charge induced on the sensor due to amplification of the primary ionization near the sensor. The NEWS-G3 project is a compact shield for a 60 cm SPC that consists of 8 layers of copper, lead, and polyethylene, one of which is muon veto designed to detect and eliminate the background caused by cosmic muons. This detector will be used to study the feasibility of coherent elastic neutrino-nucleus scattering (CEvNS) measurement at a nuclear reactor with a high neutrino flux. In this talk, I will present a summary of the NEWS-G3 project and my research on the simulation of the NEWS-G3 muon veto performance in Geant4, including estimates on the expected background caused by muons and the active time in the detector.

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