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Simulations for the Characterization of Germanium Detectors used in the Search for Neutrinoless Double Beta Decay[1] ASHER WASSERMAN, Rutgers University, CHRIS O'SHAUGHNESSY, JOHN WILKERSON, UNC-Chapel Hill, MAJORANA COLLABORATION — An open question in physics is whether neutrinos have the properties of Majorana or Dirac fermions; that is, are neutrinos their own antiparticles or not? A discovery of neutrinoless double beta ($0\nu\beta\beta$) decay would prove that neutrinos are indeed Majorana fermions. The MAJORANA Collaboration is searching for $0\nu\beta\beta$ decay in ^{76}Ge, for which single beta decay is energetically forbidden and the Standard Model allowed $2\nu\beta\beta$ decay has been observed. Tonne scale experiments aim to have a sensitivity to half lives in the range of 10^{26}-10^{27} years, corresponding to just a few counts per tonne-year in the region of interest (ROI). The goal is to minimize background in the ROI to 1 count per tonne-year. To help achieve this level of sensitivity it is important to understand the precise response of the detectors. For this purpose, a characterization stand was constructed to expose the detectors to known radioactive sources in a well-understood geometry. By building a Monte Carlo simulation of this apparatus in Geant4 it is possible to gain an understanding of the detector's response to backgrounds, so that such events may be efficiently rejected from the data set. This poster addresses the simulation of the characterization stand.

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