

Abstract Submitted  
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**Determination of the Crystal Axis Orientations of Ge detectors for the Majorana Demonstrator** WENQIN XU, Los Alamos National Lab, MATTHEW BUSCH, Duke University and Triangle Universities Nuclear Lab, STEVEN ELLIOTT, LANL, MATTHEW GREEN, University of North Carolina and TUNL, ALEX HEGAI, LBNL and University of Tuebingen, REYCO HENNING, University of North Carolina and TUNL, MICHAEL RONQUEST, LANL, KYLE SNAVELY, ARI ZITIN, University of North Carolina and TUNL, MAJORANA COLLABORATION — High purity germanium (HPGe) crystals will be used for the MAJORANA DEMONSTRATOR, where they serve as both the source and the detector for neutrinoless double beta decays. Sophisticated pulse shape analysis (PSA) is crucial in distinguishing certain background events in the energy region of interest. It is also well known that the charge-carrier mobility in Ge crystals has considerable dependence on the crystallographic axes, resulting in a crystal axis dependence of the PSA. Meanwhile, as within the Peccei-Quinn solution to the strong CP problem and as a dark matter candidate, axions have been searched for in many experiments. It has been suggested that the postulated solar axions could coherently convert to photons by the Primakoff effect in a periodic lattice, such as that found in the Ge crystals used by the DEMONSTRATOR, with conversion rates depending on the crystal axis orientation. In order to use the DEMONSTRATOR to search for solar axions, the Ge crystal axes need to be measured. In this talk, we will present our experimental measurements to characterize crystal axes with P-type point contact (PPC) HPGe detectors, which are cylindrical in shape with point contacts at the bottom.

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