

Abstract Submitted
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Development of a hemispheric p-type point-contact Ge detector to verify hole drifting models in arbitrary direction JING LIU, DONGMING MEI, University of South Dakota — We propose to develop a hemispheric p-type point-contact high-purity germanium detector to verify experimentally hole drifting models in an arbitrary direction in the germanium crystal. It would be the first of its kind in the world with such a unique geometry. Calibrated low energy gamma ray sources will be used to deposit energy close to the outer surface of the detector. Electron-hole pairs will be created there. Holes will be drifted from the surface all the way to the point contact along any chosen direction. Amorphous germanium will be used to replace commonly used Lithium-diffused surface to remove the surface effect on the measurements. Such a detector would provide direct measurements of hole drift mobilities in all directions, which can be used to verify current hole drifting models. Those models are heavily used in pulse-shape simulations for neutrinoless double beta experiments using germanium detector arrays. The verification of them would significantly improve the understanding of the behavior of holes in germanium detectors and reduce the uncertainty of detection efficiency estimated by the pulse-shape simulation packages.

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