

Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Point Contact Germanium Detector Response to Low-Energy Surface Events MATTHEW STORTINI, JASON DETWILER, CLINT WISEMAN, WALTER PETTUS, University of Washington, THE MAJORANA COLLABORATION COLLABORATION¹ — Point contact germanium detectors lead the field in the search for neutrinoless double beta decay, and they have been used to achieve the greatest half-life sensitivity to date. These detectors have excellent energy resolution, low noise, and low-energy threshold. This makes them a great candidate for rare event searches beyond neutrinoless double beta decay as well. One aspect of germanium detectors that is difficult to characterize is their passivated surface. Charge collection near the passivated surface is sensitive to near-surface impurities / defects as well as surface charge buildup. This impacts these detectors' efficiency and resolution, especially in the lower energy realm. At the University of Washington's Center for Experimental Nuclear Physics and Astrophysics we have set out to study this problem. In the investigation reported here, we use a Kr83m source, which has multiple low-energy X-rays below 15 keV, and a number of conversion electrons below approximately 30 keV. We will show first data from this study, and compare it to expectations for different charge collection models. The ultimate goal of this study is to build a model that allows us to characterize the response of a point contact germanium detector to low-energy surface events.

¹The Majorana Collaboration uses an array of high-purity point contact germanium detectors to search for neutrinoless double beta decay.

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Date submitted: 01 Jul 2019

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