

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Observation of Low-Energy Surface Photon Events with a Point Contact Germanium Detector¹ MATTHEW STORTINI, STEVEN ELLIOTT, SAMUEL MEIJER, Los Alamos National Laboratory, MAJORANA COLLABORATION COLLABORATION — Point contact germanium detectors lead the field in the search for neutrinoless double-beta decay (0νBB), and they have been used to achieve one of the greatest half-life sensitivities to date. These detectors have excellent energy resolution, low noise, and low-energy thresholds, making them well suited for a variety of rare event searches. One aspect of germanium detectors that is difficult to characterize is their passivated surface. Data from the MAJORANA Collaboration, which searches for 0νBB, shows the presence of a 46.5 keV gamma ray peak from Pb-210, but the absence of its 10.8 keV peak. It is hypothesized that passivated surface effects are the cause of this unexpected result. To understand the response of the passivated surface to low-energy photon events more thoroughly, we have designed an x-ray fluorescence source of variable x-ray energy using a collection of various foils. Using this source, we aim to build a more complete model of the passivated surface that will allow backgrounds for the MAJORANA Collaboration to be more accurately modeled.

¹This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, the Particle Astrophysics and Nuclear Physics Programs of the National Science Foundation, the Sanford Underground Research Facility, and the Los Alamos National Laboratory Directed Research and Development program.

Matthew Stortini
Los Alamos National Laboratory

Date submitted: 09 Jan 2020

Electronic form version 1.4