Abstract Submitted for the DNP12 Meeting of The American Physical Society

Effective Sea-level Cosmic Ray Exposure of Copper During **Transportation**¹ TIMOTHY BERGUSON, Juniata College, JOHN ORRELL, ESTANISLAO AGUAYO, Pacific Northwest National Laboratory, AUSTEN GREENE, California Polytechnic State University, SULI WORK IN SUPPORT OF THE MAJORANA DEMONSTRATOR PROJECT TEAM — The Majorana Project aims to observe neutrinoless double beta decay utilizing high purity germanium detectors enclosed in a low-background shield. Germanium and copper, which are to be used in the detector assembly, are susceptible to cosmogenic activation, which produces isotopes within the materials whose decay generates signals in the energy region of interest of neutrinoless double beta decay, thus serving as an unwanted background. In order to assure that the materials have not been exposed to cosmic radiation beyond the established acceptable limits, a muon detector, the Muon-Witness, was used to track the integral muon count rate. This muon rate can be used to estimate the activation levels of the materials relative to the cosmic background at sea level. Other Majorana collaborators have previously estimated the activation using another method, and the two results varied significantly. An analysis of the two methods, including simulations and measurements with the Muon-Witness checking for its efficiency to muons, seeks to understand this discrepancy.

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