

Abstract Submitted
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Surface-Alpha Backgrounds for HPGe Detectors in Neutrinoless Double-Beta Decay Experiments¹ R.A. JOHNSON, T.H. BURRITT, University of Washington, S.R. ELLIOTT, V.M. GEHMAN, V.E. GUISEPPE, Los Alamos National Lab, J.F. WILKERSON, University of North Carolina, MAJORANA COLLABORATION — The MAJORANA Experiment will use arrays of enriched HPGe detectors to search for the neutrinoless double-beta decay of ^{76}Ge . Such a decay, if found, would show lepton-number violation, confirm the Majorana nature of the neutrino, and help determine the effective Majorana neutrino mass. A potentially important background contribution to this and other double-beta decay experiments arises from decays of alpha-emitting isotopes in the ^{232}Th and ^{238}U decay chains on and near the surfaces of the detectors. An alpha particle emitted from the surface can lose energy within the dead region of a detector, depositing only a partial amount of its kinetic energy within the active region and possibly mimicking the signal from neutrinoless double-beta decay. Cleanliness, exposure to radon, detector design, and analysis techniques all contribute to the effect from surface alphas. Our experimental and simulation efforts to understand and mitigate surface alpha backgrounds for HPGe detectors will be presented.

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R.A. Johnson
University of Washington

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