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An Improved Background Model for the MAJORANA DEMONSTRATOR

The MAJORANA DEMONSTRATOR is a neutrinoless double beta decay experiment consisting of two modules of p-type point contact germanium detectors deployed in a graded shield at the 4850' level of the Sanford Underground Research Facility. A low background index has been achieved at the $0\nu\beta\beta$ Q-value, and low backgrounds above 5 keV have enabled searches for other beyond the standard model processes. Background model fits using two different statistical approaches aim to determine the sources of observed backgrounds and to explain deviations from assay-based projections. To improve upon previous studies, the many component sources of backgrounds have been regrouped by location to reduce degeneracies and improve fits to data. This work also includes updated systematic studies aimed at better quantifying uncertainties in the fit. This improved background model will help inform design choices and background considerations for the next-generation LEGEND experiment.

Mini-abstract

Detailed analysis on the backgrounds encountered by the MAJORANA DEMONSTRATOR

Experiment/Collaboration

MAJORANA Collaboration

Primary authors: REINE, Anna (UNC Chapel Hill); HAUFE, Christopher (University of North Carolina at Chapel Hill)

Presenters: REINE, Anna (UNC Chapel Hill); HAUFE, Christopher (University of North Carolina at Chapel Hill)

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