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The Liquid Argon Instrumentation of GERDA and LEGEND200

The GERDA experiment reached the most stringent limit for the neutrinoless double-beta decay in ^{76}Ge , achieving a median sensitivity of $1.1 \cdot 10^{26}$ years (90% C.L.) with a background index of $5.6_{-2.4}^{+3.4} \cdot 10^{-4}$ cts/(keV kg yr). This low background was obtained by a combination of pulse shape discrimination and operating bare germanium detectors in an instrumented liquid argon (LAr) volume. The LAr instrumentation rejects events with coincident energy depositions in the germanium detectors and the surrounding LAr. In 2020 the GERDA infrastructure was transferred to the LEGEND collaboration. The first Phase, LEGEND-200, targets a background index below $2 \cdot 10^{-4}$ cts/(keV kg yr). Based on GERDA's success, a LAr instrumentation for LEGEND-200 is in production. The results of GERDA's LAr veto system and the design of the LEGEND-200 LAr instrumentation are presented.

Mini-abstract

Performance of the GERDA LAr instrumentation and design of the LAr instrumentation for LEGEND200.

Experiment/Collaboration

GERDA and LEGEND collaborations

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