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Final results from GERDA: a neutrinoless double beta decay search

Saturday, 9 July 2022 15:00 (15 minutes)

The GERmanium Detector Array (GERDA) experiment searched for the lepton-number-violating neutrinoless double-β (0νββ) decay of 76Ge. Observing such a decay would allow to shed light onto the nature of neutrinos and its discovery would have far-reaching implications in cosmology and particle physics. By operating an array of high purity bare germanium detectors, enriched in 76Ge, in an active liquid argon shield aided by pulse shape discrimination of germanium detector signals, GERDA achieved an unprecedentedly low background index of 5.2 × 10−4 counts/(keV kg yr) in the signal region and was able to surpass the design goal of collecting an exposure of 100 kg yr in a background-free regime. With a total exposure of 127.2 kg yr combining Phase I and Phase II, no signal was observed and a lower limit on the half-life of 0νββ decay in 76Ge is set at T1/2 > 1.8 × 1026 yr at 90% C.L., which coincides with the sensitivity assuming no signal.

In-person participation

Yes

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