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Discovering Neutrinoless Double-Beta Decay in Ge-76 with the LEGEND Experiment

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The search for neutrinoless double beta ($0\nu\beta\beta$) decay is considered as the most promising way to prove the Majorana nature of neutrinos as well as to give indication on the mass hierarchy and on the absolute mass scale. The discovery of $0\nu\beta\beta$ decay would moreover open the way for theories predicting the observed matter anti-matter asymmetry of the Universe being a consequence of lepton number violation through leptogenesis.

Building upon the success of GERDA and MAJORANA experiments, the LEGEND (Large Enriched Germanium Detector for Neutrinoless bb Decay) Collaboration aims at building a ^{76}Ge-based $0\nu\beta\beta$ experiment with a sensitivity on the half-life beyond 10^{28} years, to fully span the inverted neutrino mass ordering region. The LEGEND project will proceed in two steps: in the first phase, 200 kg of enriched germanium detectors will be deployed in the existing GERDA facility at LNGS. With an exposure of 1 t·yr and a BI of 0.5 cts/(FWHM·t·yr), LEGEND-200 will be able to reach a sensitivity of about 10^{27} yr at 90% C.L. In the second phase, the enriched germanium mass will be increased up to 1000 kg. With a background index of 0.025 cts/(FWHM·t·yr) and with an exposure of 10 t·yr, LEGEND-1000 will be able to reach a 3σ half-life discovery sensitivity of 1.3×10^{28} yr. In this talk an overview of the LEGEND project will be presented together with the status of LEGEND-200, currently in the commissioning phase at LNGS.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

LEGEND

Is the speaker for that presentation defined?

No

Details

N/A

Internet talk

Maybe

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