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LEGEND ^{76}Ge Detectors: Production, Characterization, and Performance

LEGEND searches for lepton number violation in neutrinoless double beta ($0\nu\beta\beta$) decay using ^{76}Ge -enriched high-purity germanium (HPGe) detectors immersed in liquid argon. The first stage, LEGEND-200, will operate 200 kg of detectors, a significant fraction of which are the new large Inverted Coaxial Point Contact (ICPC) detectors currently under production. An extensive characterization campaign to determine the basic operational parameters of the newly produced detectors is performed in vacuum cryostats at two underground sites in order to reduce the internal creation of cosmogenic radionuclides. Other dedicated scanning setups are used to obtain a detailed understanding of alpha and beta surface events on the p+ and n+ contacts which are projected to be the dominant backgrounds for the $0\nu\beta\beta$ decay search.

This poster will present the production experience of the new ICPC detectors, the ongoing characterization campaigns, and the projected detector performances based on recent measurements.

Mini-abstract

LEGEND tests its first new detectors for next double beta decay search.

Experiment/Collaboration

LEGEND

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