



Contribution ID: 80

Type: Poster

Search for Beyond the Standard Model physics with LEGEND-1000

The LEGEND experiment is a phased approach for searches for neutrinoless double beta ($0\nu\beta\beta$) decay using ^{76}Ge -enriched germanium detectors immersed in liquid argon. While the first stage LEGEND-200 plans to start data taking by 2021, the subsequent ton-scale effort is in its initial design phase. As shown by current experiments, the unique properties of germanium detectors - excellent energy resolution, low noise, and ultra-low background – allow competitive searches in additional beyond-standard-model physics with relative low exposures. We discuss how design choices, like the use of depleted argon, can create unique opportunities to build a sensitive experiment for topics such as bosonic dark matter, light WIMPs, solar axions, forbidden decays, or fractional charge searches without compromising the main physics goal of finding $0\nu\beta\beta$.

Mini-abstract

We will present BSM results in germanium-based experiments, and the reach of the LEGEND experiment.

Experiment/Collaboration

LEGEND

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Session Classification: Poster Session 1