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Neutron Background Simulations for LEGEND-1000 in a Geant4-based Framework

This year, the LEGEND (Large Enriched Germanium Experiment for Neutrinoless Double-beta decay) Collaboration has begun the construction of its initial phase, LEGEND-200, using the existing GERDA infrastructure, with a final 1000-kg installation (LEGEND-1000) planned. Using a custom simulation module based on Geant4, we are examining the neutron-induced background from multiple origins, such as cosmogenic activation and radioactivity in detector materials. A variety of detector, veto, and shielding options are being investigated, with the goal of optimizing the final design of LEGEND-1000, and understanding its dependence on the project's location. I will be discussing the progress and status of this work.

Mini-abstract

Simulations for LEGEND help optimize the final design of LEGEND-1000.

Experiment/Collaboration

The LEGEND Collaboration

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