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The JuLeAna Software: How to run an entire experiment in Julia

Tuesday 1 October 2024 09:00 (30 minutes)

The Large Enriched Germanium Experiment for Neutrinoless ββ Decay (LEGEND) experimental program is dedicated to the search for the neutrinoless double-beta (0νββ) decay of ^{76}Ge with isotopically enriched high-purity germanium (HPGe) detectors and a discovery sensitivity beyond a half-life of 10^{28} years. The project's first phase, LEGEND-200, has stably accumulated physics data at the Laboratori Nazionali del Gran Sasso (LNGS) for over a year with 142 kg of HPGe detectors and plans to install more in the coming months. The experiment uses two software stacks with two independent analysis teams. This talk will highlight the status and development of the JuLeAna (Julia LEGEND Analysis) software stack and its application to current LEGEND data. It will focus on the performance and data handling for the Digital Signal Processing (DSP), the calibration and fitting routines, event level building, metadata, and IO handling. Furthermore, a quick showcase will highlight the dataflow adaption within a custom SLURM-based parallel processing environment.

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