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LLAMA - A novel system for in-situ monitoring of optical parameters in liquid argon

Large volume liquid argon (LAr) detectors require a precise assessment of optical key parameters for both modeling and interpreting the data. These parameters include the light yield, the triplet lifetime, and in particular, the attenuation length at the 128 nm primary scintillation wavelength. A change in impurity concentrations within the LAr volume affects these values and therefore requires a dedicated monitoring system, especially for long-term measurements.

The next-generation neutrinoless double beta decay experiment LEGEND employs the LAr technology as part of its active veto system. The LLAMA (LEGEND Liquid Argon Monitoring Apparatus) will reside permanently in the LAr volume of LEGEND-200, the first phase of LEGEND, measuring the aforementioned optical key parameters continuously. An overview of LLAMA as well as the first results will be shown.

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Mini-abstract

LLAMA monitors the attenuation length and other optical key parameters of liquid argon in-situ

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