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A New Results of AMoRE-I Experiment

Thursday, 7 July 2022 18:00 (15 minutes)

AMoRE (Advanced Mo-based Rare process Experiment) is an international project to search for the neutrinoless double beta ($0\nu\beta\beta$) decay of ^{100}Mo in enriched Mo-based scintillating crystals using metallic magnetic calorimeters in a mK-scale cryogenic system. The project aims at operating the detector in a zero-background condition to detect this extremely rare decay event in the region of interest near 3.034 MeV, the Q-value of ^{100}Mo $0\nu\beta\beta$. The simultaneous measurement of phonon and photon signals based on the metallic magnetic calorimeter (MMC) read-outs is performed at a few tens mK temperatures to achieve a high resolution and a good background rejection. AMoRE-I, the phase following the successfully completed AMoRE-pilot, has been running with thirteen $^{48\text{depleted}}Ca^{100}MoO_4$ and five $Li_2{}^{100}MoO_4$ crystals in the Yangyang underground laboratory, corresponding to ~3 kg of 100Mo. Since the beginning of the experiment in Sep. 2020, we have accumulated more than 300 days of physics data and analyzed over two-thirds of them. Here, we present the current status of the experiment, its analysis methods, and the most recent performance results.

In-person participation

Yes

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