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Result of AMoRE-I Experiment

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AMoRE is an international experimental project to search for the neutrinoless double beta ($0\nu\beta\beta$) decay of ^{100}Mo utilizing enriched molybdate scintillating crystals and metallic magnetic calorimeters in a mK-scale cryogenic system. The project aims for zero background in the region of interest near 3.034 MeV, the Q-value of ^{100}Mo $0\nu\beta\beta$ decay, by simultaneously measuring phonon and photon signals for high energy resolution and good rejection of alpha-induced backgrounds. AMoRE-I, a phase following the completed AMoRE-pilot, operates with thirteen $^{48depleted}Ca^{100}MoO_4$ and five $Li_2{}^{100}MoO_4$ crystals in the Yangyang underground laboratory. Since the beginning of the experiment in Sep. 2020, we have accumulated more than 600 days of stable physics data with advanced noise suppression, lowering the background level below the pilot phase. With an improved ROI estimation analysis method and cut efficiency calculation, we will report a new higher half-life limit of ^{100}Mo $0\nu\beta\beta$ decay from the AMoRE-I experiment data.

Submitted on behalf of a Collaboration?

Yes

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