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Status and Results from the MAJORANA DEMONSTRATOR Experiment

The MAJORANA DEMONSTRATOR experiment is searching for neutrinoless double-beta decay ($0\nu\beta\beta$) in Ge-76 with an array of p-type, point-contact (PPC) Ge detectors. A total of 44 kg (30 kg enriched in Ge-76) of Ge detectors are split between two modules and operating in a low background passive and active shield since 2015 at SURF. An unprecedented energy resolution of 2.5 keV FWHM and a low background rate at 2039 keV allows sensitivity to a competitive $0\nu\beta\beta$ half-life from a modest exposure. Due to its low energy threshold and low background rate, the DEMONSTRATOR has also been used to search for other physics beyond the Standard Model, including bosonic dark matter and tri-nucleon decay. PPC technology allows for excellent energy resolution and the identification of specific background event populations. We present the latest analysis improvements, recent hardware upgrade, and the overall performance and results from the MAJORANA DEMONSTRATOR.

Mini-abstract

Analysis improvements strengthen the performance of the MAJORANA DEMONSTRATOR Experiment

Experiment/Collaboration

MAJORANA Collaboration

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