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Status and Initial Results of the Majorana Demonstrator

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Located at the 4850' level of the Sanford Underground Research Facility (SURF), the Majorana Demonstrator (MJD) experiment is searching for neutrinoless double beta ($0\nu\beta\beta$) decay in ^{76}Ge with high-purity Germanium (HPGe) detectors. The initial goals of the Demonstrator are to establish the required background and scalability of a ton-scale Ge-based experiment.

The construction and commissioning of the Demonstrator has been completed and the multiple-year data-taking has started. Initial results from the first physics run has demonstrated an unprecedented energy resolution of 2.5 keV FWHM at $Q_{\beta\beta}$ and an ultra-low background that is consistent with the background goals. The initial 10 kg·yr of enriched Ge exposure resulted in a lower limit on the $0\nu\beta\beta$ decay half-life of 1.9×10^{25} yr (90% CL). In this talk, we will discuss the status of the Majorana Demonstrator, the recent physics results, and the implications and status of the LEGEND ton-scale Ge-based neutrinoless double-beta decay program.

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