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Status of the Majorana Demonstrator Neutrinoless Double-Beta Decay Experiment

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The Majorana Demonstrator is an experiment searching for neutrinoless double beta decay in ^{76}Ge . The Demonstrator consists of 44 kg (30 kg enriched in ^{76}Ge) germanium detectors in two modules operating at the 4850' level of the Sanford Underground Research Facility in Lead, South Dakota. The experiment has recently concluded its primary physics data taking campaign in March 2021, having operated since 2015. Published results with a 26 kg-yr exposure achieved a world-leading energy resolution of 2.5 keV FWHM at the double beta decay Q -value, one of the lowest background indices at the double beta decay Q -value, and a half-life lower limit of 2.7×10^{25} yr (90% C.L.). The low backgrounds, low-energy thresholds, and excellent energy resolution also enable competitive searches for double-beta decay to excited states and beyond the Standard Model physics. In 2020, one module underwent significant hardware upgrades, which involved replacing several p-type point contact (PPC) detectors with four larger, novel geometry inverted coaxial point contact (ICPC) detectors. In this talk, we present the latest results of the Majorana Demonstrator including, the increased available exposure, improved analysis, and performance since the upgrade.

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