

Abstract Submitted  
for the PSF20 Meeting of  
The American Physical Society

**Overview of the MAJORANA DEMONSTRATOR Experiment<sup>1</sup>**

TUPENDRA OLI, University of South Dakota, MAJORANA COLLABORATION — Neutrinoless double beta decay ( $0\nu\beta\beta$ ) is a hypothesized nuclear transition which, if observed, would unambiguously demonstrate the violation of an observed symmetry of the Standard Model (SM) and establish the Majorana nature of neutrinos. The MAJORANA DEMONSTRATOR is a Ge-based  $0\nu\beta\beta$  experiment currently operating at the 4850' level of the Sanford Underground Research Facility in Lead, SD. The DEMONSTRATOR operates 44 kg of p-type point contact Ge detectors (30 kg enriched in Ge-76) in two modules that are surrounded by low background passive shield. The experiment has achieved the best energy resolution of any current generation experiment which is at 2.5 keV FWHM at the 2039 keV Q-value for  $0\nu\beta\beta$ . In addition to  $0\nu\beta\beta$  search, the excellent energy resolution and ultra-low background allow the DEMONSTRATOR to search for new physics beyond the Standard Model in the low energy region. The completed hardware upgrade has improved cable and connector reliability and sets the final run configuration of the DEMONSTRATOR. In this talk, we will review the DEMONSTRATORs latest results, recent upgrades, and ongoing data-taking and analysis improvement efforts. The status and near-term plans of the experiment will be discussed.

<sup>1</sup>This material is supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, the Particle Astrophysics and Nuclear Physics Programs of the National Science Foundation, and the Sanford Underground Research Facility.

Tupendra Oli  
University of South Dakota

Date submitted: 29 Oct 2020

Electronic form version 1.4