

Status of the MAJORANA DEMONSTRATOR

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A discovery of neutrinoless double beta decay ($0\nu\beta\beta$) would establish that neutrinos are their own antiparticles, prove total lepton number violation, and provide a mechanism for generating non-zero neutrino masses. The MAJORANA DEMONSTRATOR experiment searches for $0\nu\beta\beta$ in ^{76}Ge with two shielded modules of high purity germanium (HPGe) detectors, ~30 kg of which are enriched to 88% in ^{76}Ge . The enriched detectors of the DEMONSTRATOR took data between 2015 and 2021, when they were removed for deployment in the Large Enriched Germanium Experiment for Neutrinoless $\beta\beta$ Decay (LEGEND). An upgrade of a module in 2020 with improved connectors and cabling successfully made all of its detectors operational, and it allowed the deployment of four inverted coaxial point contact (ICPC) enriched ^{76}Ge detectors to study their performance prior to use in LEGEND. Excellent energy performance has been achieved with the DEMONSTRATOR HPGe detectors, including low energy threshold, great linearity, and a FWHM energy resolution that is approaching 0.1% at the double beta decay Q-value, the best in all $0\nu\beta\beta$ experiments. The DEMONSTRATOR has successfully demonstrated the feasibility and advantages of the ton-scale LEGEND project, and it has also been highly productive and competitive in a broad range of physics topics. In this talk, we will focus on the status of the DEMONSTRATOR's $0\nu\beta\beta$ decay result.

Presenter: HOSTIUC, Alexandru (University of Washington)

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