

## Progress toward a two-neutrino double-beta decay measurement for the MAJORANA DEMONSTRATOR

The MAJORANA DEMONSTRATOR is a  $^{76}\text{Ge}$ -based neutrinoless double-beta decay ( $0\nu\beta\beta$ ) experiment. Staged at the 4850' level of the Sanford Underground Research Facility, the DEMONSTRATOR operates an array of high-purity p-type point contact Ge detectors deployed within a graded passive shield and an active muon veto system. The present work concerns the two-neutrino double-beta decay mode ( $2\nu\beta\beta$ ) of  $^{76}\text{Ge}$ . For Ge detectors, with superior energy resolution (0.1%), this mode poses negligible background to the  $0\nu\beta\beta$  mode, even for a ton-scale experiment. However, a precision measurement of the  $2\nu\beta\beta$  shape allows for searches for new physics such as Majoron-accompanied  $0\nu\beta\beta$ . The measurement of the  $2\nu\beta\beta$  mode also allows for careful systematic checks of pulse shape discrimination cuts related to both the  $0\nu\beta\beta$  and  $2\nu\beta\beta$  decay modes. Work is underway to construct a full experimental background model enabling a Bayesian fit to the measured energy spectrum and extraction of a precise  $2\nu\beta\beta$  spectrum and half-life determination.

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