

Abstract Submitted
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Detector String Design and Prototype Tests for the MAJORANA Science Program VICTOR GEHMAN, Los Alamos National Laboratory, MAJORANA COLLABORATION — The MAJORANA experiment is a next-generation $0\nu\beta\beta$ search that will probe the effective Majorana neutrino mass parameter, $\langle m_{\beta\beta} \rangle$ with excellent sensitivity. At its DEMONSTRATOR stage (20–30 kg of enriched detectors out of a total of 40 kg at the Sanford Laboratory), MAJORANA will be sensitive to $\langle m_{\beta\beta} \rangle$ at the level of a few hundred meV. The planned ton-scale experiment would reach well down into the inverted hierarchy. Part of the strategy for attaining these physics goals is to deploy tens of detectors in close-packed “string mounts” into the same cryostat. The design considerations for these strings in terms of minimizing: cooling time, detector-to-detector cross talk, microphonic pickup and other sources of electronic noise, while maintaining close detector packing and minimal support structure mass represent an interesting and important component of the MAJORANA R&D program. Here, we will present the status of current MAJORANA detector string design activities, with special attention paid to electrical and thermal tests. We will also present a brief outline of future tests related to this component of the MAJORANA experimental program. We gratefully acknowledge the support of the U.S. Department of Energy through the LANL/LDRD Program for this work.

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