

Low background materials and fabrication techniques for Cables and connectors of the Majorana Demonstrator

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Content

The Majorana Collaboration is searching for the neutrinoless double-beta decay of the nucleus ^{76}Ge . The Majorana Demonstrator is an array of germanium detectors deployed with the aim of implementing background reduction techniques suitable for a 1-tonne ^{76}Ge -based search (LEGEND). These germanium detectors operate in an ultra-pure vacuum cryostat at 80K. One special challenge of an ultra-pure environment is to develop reliable cables, connectors, and electronics that do not significantly contribute to the radioactive background of the experiment. In this talk I will highlight the experimental requirements and how these requirements were met for the Majorana Demonstrator, including plans to upgrade the wiring for higher reliability in late 2017. I will also highlight requirements for LEGEND and R&D efforts underway to meet these additional requirements. This material is based upon work 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.

Summary

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