



Contribution ID: 457

Type: **Poster**

Neutron Veto Instrumentation for LEGEND-1000

Wednesday 30 August 2023 15:59 (1 minute)

LEGEND-1000 is a next-generation ton-scale experiment searching for neutrinoless double beta decay of ^{76}Ge using p-type, high-purity germanium detectors. The experiment is planned for 1000 kg of Ge detectors enriched to more than 90% in ^{76}Ge .

The experiment is going to be installed in an underground laboratory (SNOLAB at 6000 mwe or LNGS at 3800 mwe) to reduce direct and induced backgrounds from cosmic rays.

While standard analysis techniques are very effective in removing prompt backgrounds, muon-induced events, associated with the production of long-lived isotopes in Ge detectors, require the application of delayed coincidence cuts between muon veto, liquid argon veto, and the Ge detectors.

We present selected details of the new active veto for LEGEND-1000 at LNGS. The goal is to increase the instrumented liquid argon volume in order to enhance the delayed coincidence cut efficiency.

We will also discuss various readout options considered and related preliminary simulation results.

This work is supported by the U.S. DOE and the NSF, the LANL, ORNL and LBNL LDRD programs; the European ERC and Horizon programs; the German DFG, BMBF, and MPG; the Italian INFN; the Polish NCN and MNiSW; the Czech MEYS; the Slovak SRDA; the Swiss SNF; the UK STFC; the Russian RFBR; the Canadian NSERC and CFI; the LNGS, SNOLAB, and SURF facilities.

Submitted on behalf of a Collaboration?

Yes

Primary author: MORELLA, Michele (Gran Sasso Science Institute)

Co-authors: BARTON, CJ (RomaTre University and INFN RomaTre); CATTADORI, Carla (Milano Bicocca University and INFN Milano Bicocca); MACOLINO, Carla (L'Aquila University and INFN LNGS); WIESINGER, Christoph (Technische Universität München); SALAMIDA, Francesco (L'Aquila University and INFN RomaTre); SALAMANNA, Giuseppe (RomaTre University and INFN RomaTre); ABRITTA, Igor (RomaTre University and INFN RomaTre); PERTOLDI, Luigi (Technische Universität München and INFN Padova); NEUBERGER, Moritz (Technische Universität München); DI MARCO, Natalia (Gran Sasso Science Institute); BRUGNERA, Riccardo (Padova University and INFN Padova); MEIRELES, Sincler (L'Aquila University and INFN LNGS); CALGARO, Sofia (Padova University and INFN Padova); SCHÖNERT, Stefan (Technische Universität München); BIANCACCI, Valentina (Gran Sasso Science Institute and INFN LNGS); D'ANDREA, Valerio (INFN RomaTre)

Presenter: MORELLA, Michele (Gran Sasso Science Institute)

Session Classification: Poster session

Track Classification: Neutrino physics and astrophysics