

Abstract Submitted  
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**Experimental and Computational Methods for the LEGEND Experiment** JOSE COLON RIVERA, North Carolina State University — The LEGEND Experiment aims to find evidence of a rare nuclear process known as neutrinoless double-beta decay ( $0\nu\beta\beta$ ) with significant implications for the Standard Model. The detection of  $0\nu\beta\beta$  requires extremely low radiation backgrounds achievable by submerging high purity germanium-76 crystals in a depleted liquid argon (LAr) veto. The MAJORANA DEMONSTRATOR is an ongoing experiment located 4850 ft. underground in the Sanford Underground Research Facility (SURF) in Lead, South Dakota, with the purpose of determining whether a 1000 kg experiment such as LEGEND can be realized. We describe experimental methods for determining the rate of contamination of the depleted LAr with  $^{42}\text{Ar}$  radioisotopes and we create a Geant4-based simulation of a LEGEND cryostat to test the shielding properties of various detector geometries

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