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Spectral analysis for the MAJORANA DEMONSTRATOR experiment

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The MAJORANA DEMONSTRATOR is an experiment constructed to search for neutrinoless double-beta decays in germanium-76 and to demonstrate the feasibility to deploy a large-scale experiment in a phased and modular fashion. It consists of two modular arrays of natural and 76Ge-enriched germanium detectors totaling 44.1 kg, located at the 4850' level of the Sanford Underground Research Facility in Lead, South Dakota, USA.

Data taken with this setup since summer 2015 at different construction stages of the experiment show a clear reduction of the observed background index around the ROI for $0\nu\beta\beta$-decay search due to improvements in shielding. In this talk we discuss the analysis approaches of the different datasets. Using models based on Monte Carlo simulations, the contribution of different background components -such as $2\nu\beta\beta$-decay, cosmogenic activation, and external radiation - can be quantified. In addition we discuss the statistical approaches to quantify the physics sensitivity of a possible $0\nu\beta\beta$-signal.

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