A background model for the MAJORANA **neutrinoless double-beta decay experiment** ALEXIS SCHUBERT, University of Washington, MAJORANA COLLABORATION — The MAJORANA Collaboration[1] will search for neutrinoless double-beta decay ($0\nu\beta\beta$) of ^{76}Ge in an array of germanium detectors. Observation of $0\nu\beta\beta$ would determine whether the neutrino is a Majorana particle and could provide information about neutrino mass. MAJORANA will require an extremely low background rate to acheive high sensitivity to the $0\nu\beta\beta$ rate. Radioactive decays and cosmogenically-induced radiation create backgrounds to the potential signal. Understanding and minimization of backgrounds is critical to the sensitivity of the experiment. The MAJORANA background model uses material radiopurity information and Monte Carlo simulation results to describe the expected background energy spectrum. This model can be validated through comparison with low-background energy spectra collected from prototype detectors. MAJORANA collaborators installed a low-background germanium detector in the Kimbalton Underground Research Facility (KURF) in Ripplemeade, Virginia. Results of the MAJORANA Low-background BEGe at KURF (MALBEK) validation study are used to inform the MAJORANA background model.

[1]F.T. Avignone III (2007) arXiv:0711.4808v1

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