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Preparatory Low-Background Assay Analysis ALEX LONG, The University of North Carolina - Chapel Hill, and Triangle Universities Nuclear Laboratory, UNC - CHAPEL HILL PARTICLE ASTROPHYSICS TEAM — Confirmation of previous observational claims of neutrino-less double-beta decay ($0\nu\beta\beta$) made by Klapdor and Kleingrothaus could have tremendous physical implications. This includes: violation of lepton number conservation in the Standard Model, measurement of the $0\nu\beta\beta$ decay-rate, improved limits in the measurement of the Majorana mass of the electron neutrino, and support for the theoretical consideration that the neutrino is its own antiparticle. The Majorana Collaboration will use enriched Ge-76 crystals in a low-background environment, to probe below the current upper limits of the neutrino-mass region. Our sub-group is performing a materials assay for the Majorana experiment, using two High Purity Germanium (HPGe) coaxial detectors located in the Kimbalton Underground Research Facility (KURF). My contribution is primarily in the quantitative analysis and identification of prominent contaminants found in the construction materials being used in the Majorana experiment. This is achieved by comparison of Gamma-ray spectra to known radioactive decay-chains and creating consistent methods for computing the absolute activities of contaminants using efficiencies found from Monte Carlo simulation.

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