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Radioactive background studies for the CUORE neutrinoless double beta decay experiment MICHELLE DOLINSKI, Lawrence Berkeley National Laboratory and University of California, Berkeley, CUORE AND CUORICINO COLLABORATION — The proposed CUORE experiment will use an array of ~ 1000 TeO₂ bolometers to search for neutrinoless double beta decay at the Gran Sasso Laboratory in Italy. The currently operating Cuoricino experiment, with 62 bolometers, is both a prototype for CUORE and an independent neutrinoless double beta decay experiment. In order for CUORE to reach a five year sensitivity on the effective neutrino mass on the order of 30 meV, a background of less than 0.01 counts/keV/kg/y in the double beta decay region is needed. We have examined the contributions to the radioactive background from copper, TeO₂ powder, and the teflon that supports the crystals and provides a weak thermal link to the cold reservoir. In particular, we have used neutron activation analysis and low background gamma ray spectroscopy to determine the concentrations of uranium and thorium in the teflon used in Cuoricino. In this talk, we will present our findings.

Michelle Dolinski
Lawrence Berkeley National Laboratory and University of California, Berkeley

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