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Analysis of Double Beta Decays of ^{100}Mo to Excited States in CUPID-Mo TOBY DIXON, University of California, Berkeley, CUPID-MO COLLABORATION — CUPID-Mo, located at the Laboratoire Souterrain de Modane, in France was a demonstrator for CUPID, a next generation search for $0\nu\beta\beta$ in ^{100}Mo. CUPID-Mo consisted of 20 $\sim$ 200 g $Li_2^{100}MoO_4$ scintillating bolometers with 20 Ge light detectors. It has demonstrated excellent crystal radiopurity (^{238}U ^{232}Th chains $0.3-1$ $\mu Bq/kg$ for relevant isotopes), α, β/γ particle discrimination ($>$ 99.9%), and energy resolution ($\sim$ 7 keV FWHM at 2615 keV). CUPID-Mo has placed the leading limit on the half life of $0\nu\beta\beta$ in ^{100}Mo of $T_{1/2}^{0\nu} > 1.5 \cdot 10^{24}$ yr with 90% C.I. In this talk we present the status of analysis of double beta decays of ^{100}Mo to excited states of ^{100}Ru. In these decays, the electrons are accompanied by one or more de-excitation gamma lines. Multi-site events provide a very clear experimental spectrum technique to reduce background rates when searching for these gammas.

Toby Dixon
University of California, Berkeley

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