

Abstract Submitted  
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**Measuring the Half Life of  $^{229m}\text{Th}$**  E. SWANBERG, UC Berkeley, J.T. BURKE, R.J. CASPERSON, S.A. SHEETS, B.R. BECK, N.D. SCIELZO, Lawrence Livermore National Laboratory, E.B. NORMAN, UC Berkeley —  $^{229}\text{Th}$  has the lowest known nuclear excited state at  $7.6 \pm 0.5$  eV.<sup>1</sup> Decay to the ground state has never been directly observed, and the half life is unknown. Excitation from the ground state could allow applications such as a nuclear clock or a quantum computer. The half life, and hence the line width, are needed to pursue these applications. Due to the low energy, internal conversion (IC) is expected to be the dominant decay mode. The current experiment is attempting to measure the half life by searching for IC electrons or photons emitted as a result of IC. We have measured the IC electron emission of  $^{235m}\text{U}$  (76 eV energy, 26 minute half life) to validate or setup. Results to date will be presented. Partially supported by the U.S. Department of Homeland Security. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

<sup>1</sup>B.R. Beck *et al.* (2007). “Energy Splitting of the Ground-State Doublet in the Nucleus  $^{229}\text{Th}$ .” *Phys. Rev. Lett.* **98**: 142501

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