

Abstract Submitted
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Searching for the Decay and Half Life of the 7.6 eV Excited State in the Thorium-229 Nucleus¹ ERIK SWANBERG, UC Berkeley, JASON BURKE, ROBERT CASPERSON, Lawrence Livermore National Laboratory, RICK NORMAN, UC Berkeley — Thorium-229 has the lowest known nuclear excited state at 7.6 eV [1]. The state has been known to exist for 35 years, but its decay to the ground state has never been directly observed. Because it has an extremely low energy for a nuclear state, a unique set of applications are possible, including a nuclear clock, a nuclear laser, and investigations into Bound Internal Conversion, Nuclear Excitation by Electronic Transition and Nuclear Excitation by Electron Capture. We are currently conducting experiments to observe the decay and measure its half life. We use uranium-233 alpha decay as our source of thorium-229 excited nuclei and use several different methods to search for the half life over a range from nanoseconds to days.

[1] Beck et al., PRL 98, 142501 (2007)

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