Abstract Submitted for the DNP13 Meeting of The American Physical Society

Search for Nuclear Excitation by Electronic Transition in U-235<sup>1</sup> P.A. CHODASH, E.B. NORMAN, UC Berkeley, J.T. BURKE, S.C. WILKS, R.J. CASPERSON, E.L. SWANBERG, Lawrence Livermore National Laboratory, M.A. WAKELING, Washington State University, T.J. CORDEIRO, United States Air Force Academy — Nuclear excitation by electronic transition (NEET) is a rare nuclear excitation that is predicted to occur in numerous isotopes, including U-235. When a nuclear transition matches the energy and the multipolarity of an electronic transition, there is a possibility that NEET will occur. If NEET were to occur in U-235, the nucleus would be excited to its 1/2+ isomeric state that subsequently decays by internal conversion with a decay energy of 77 eV and a half-life of 26 minutes. Theory predicts that NEET can occur in partially ionized uranium plasma with a charge state of 23+. A pulsed Nd:YAG laser operating at 1064 nm with a pulse energy of 780 mJ and a pulse width of 9 ns was used to generate the uranium plasma. The plasma was collected on a plate and the internal conversion electrons were focused onto a microchannel plate detector by a series of electrostatic lenses. Depleted uranium and highly enriched uranium samples were used for the experiment. Preliminary results will be presented.

<sup>1</sup>This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344. This work was further supported by the U.S. DHS, UC Berkeley, and the NNIS Fellowship.

> Perry Chodash UC Berkeley

Date submitted: 01 Jul 2013

Electronic form version 1.4