Abstract Submitted for the DNP08 Meeting of The American Physical Society

Observation of an excited state in 101 Sn via the α -decay of 105 Te¹ SEAN LIDDICK, IAIN DARBY, University of Tennessee, ROBERT GRZYWACZ. University of Tennessee and Physics Division Oak Ridge National Laboratory, KRZYSZTOF RYKACZEWSKI, Physics Division Oak Ridge National Laboratory, ROBERT PAGE, University of Liverpool, CARL GROSS, Physics Division Oak Ridge National Laboratory, JON BATCHELDER, UNIRIB — The doubly magic nucleus ¹⁰⁰Sn is a key test nucleus for the nuclear shell model. Required information in this region is knowledge of single-particle energies, particularly the energy separation between the $\nu d_{5/2} - \nu g_{7/2}$ orbitals. For the ¹⁰⁰Sn region, the energy separation can be best extracted from the energy of the first excited state in ¹⁰¹Sn. In experiments performed at the HRIBF using the RMS α -decay chains of 109 Xe \rightarrow 105 Te \rightarrow 101 Sn were observed following implants of 109 Xe ions into a DSSD, fully instrumented with Digital Signal Processing, placed within the γ -array CARDS. Double α -decay pulse shapes provide a unique and clean coincidence requirement which resulted in the observation of a γ -ray, interpreted as being emitted from the first excited state in ¹⁰¹Sn. These results will be presented and the implications for the single-particle level assignments will be discussed.

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