Abstract Submitted for the SES19 Meeting of The American Physical Society

Neutrinoless Double Beta Decay through Argon 40 Data RYAN GOODWIN, SCOTT WOOLARD, None, TUNL LAB COLLABORATION — Twoproton drop-off reactions can test the Bardeen-Cooper-Schrieffer (BCS) approximation used to describe the ground states in Quasi-Random Phase Approximation (QRPA) calculations of double beta-decay nuclear matrix elements (NME). ^{134,136}Xe(³He,n) reaction measurements have been carried out at the TUNL tandem laboratory to test the BCS approximation for ¹³⁶Xe double-beta decay. The measurements were carried out using a neutron time of flight system with a 13 m flight path, achieving a 3 ns timing resolution. We will report on analysis of ⁴⁰Ar(³He,n) cross-sections carried out with the same experimental setup to characterize systematic errors.

> Ryan Goodwin None

Date submitted: 01 Oct 2019

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