Abstract Submitted
for the DNP19 Meeting of
The American Physical Society

Investigation of the QRPA method for the neutrinoless double beta decay candidate ^{136}Xe using two-nucleon transfer.[1] REBECCA TOOMEY, DAVID WALTER, Rutgers University, MICHAEL FEBBRARO, STEVEN PAIN, KELLY CHIPPS, CAROLINE NESARAJA, WILLIAM PETERS, MICHAEL SMITH, Oak Ridge National Laboratory, DANIEL BARDAYAN, JAMES KOLATA, PATRICK O'MALLEY, University of Notre Dame, FREDERICK BECHETTI, University of Michigan, KATE JONES, CORY THORNSBERRY, University of Tennessee, BENJAMIN KAY, Argonne National Laboratory, RAYMOND KOZUB, Tennessee Technological University — The observation of neutrino oscillations implies that the neutrino has a finite rest mass and, as such, may possibly allow decay via the hitherto unobserved neutrinoless double beta decay. There are many major experimental efforts focused on observing this decay mode. Were the decay to be observed, its rate and calculated nuclear matrix elements would provide information on the effective neutrino mass. However, calculations of the required nuclear matrix elements are inherently difficult and often exhibit large uncertainties. Often, quasiparticle random phase approximation (QRPA) methods are used, which rely on the assumption that the initial and final states can be described as a BCS condensate. This can be tested experimentally using two-nucleon transfer, where a breakdown of the BCS assumption could manifest as a pairing vibration, or pair-correlated excited states. The proposed measurement of ^{134}Xe(^{3}He,n)^{136}Ba to investigate the $0\nu\beta\beta$ decay candidate ^{136}Xe, and the potential implications of the results will be discussed.

[1]This work has been supported in part by the U.S. D.O.E and the NSF.

Rebecca Toomey
Rutgers University, New Brunswick

Date submitted: 01 Jul 2019 Electronic form version 1.4