

Abstract Submitted  
for the DNP20 Meeting of  
The American Physical Society

**Exploring the Physics of Neutron-Unbound Nuclei Produced from Ne-28 and Ne-29 Fragment Beams**<sup>1</sup> ALAURA CUNNINGHAM, National Superconducting Cyclotron Laboratory, MSU, THE MONA COLLABORATION — Experimental studies of neutron-unbound systems provide important input to aid the development of theoretical models that describe exotic nuclei. In 2016, the MoNA Collaboration performed an experiment at the National Superconducting Cyclotron Laboratory to measure the half-life of O-26. The Coupled Cyclotron Facility provided a 140 MeV/u Ca-48 primary beam that impinged on a beryllium target to produce F-27, Ne-28, Ne-29, and Na-30 secondary beams. The analysis of the recorded data focused on events in which the two-neutron decay of O-26 produced from the F-27 secondary beam was measured. As such, a large fraction of the dataset is unused. The current project aims to extract the decay energy spectra for neutron-unbound systems produced from the Ne-28 and Ne-29 beams and compare them to previous measurements while also searching for new neutron-unbound states. In particular, measurements of one- and multi-neutron coincidences with F-25, F-24, or O-22 fragments produced from the Ne-28 beam and F-27, F-26, O-24, or O-22 produced from the Ne-29 beam will be compared to previous studies.

<sup>1</sup>This work was supported by the National Science Foundation, USA under Grants No. PHY-1102511, PHY-1565546, PHY-1613188, PHY-1713522, PHY-1613429, PHY-1713956. This work was also supported by the Department of Energy National Nuclear Security Administration, USA through the Nuclear Science and Security Consortium under Award No. DE-NA0003180.

Thomas Redpath  
National Superconducting Cyclotron Laboratory, MSU

Date submitted: 03 Aug 2020

Electronic form version 1.4