

Abstract Submitted
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A multi-layered active target for the study of neutron-unbound nuclides at NSCL¹ JESSICA FREEMAN, PAUL GUEYE, Hampton University, THOMAS REDPATH, NSCL/MSU, MONA COLLABORATION — The characteristics of neutron-unbound nuclides were investigated using a multi-layered Si/Be active target designed for use with the MoNA/LISA setup at the National Superconducting Cyclotron (NSCL). The setup consists of the MoNA/LISA arrays (for neutron detection) and a superconducting sweeper magnet (for charged separation) to identify products following the decay of neutron unbound states. The segmented target consisted of three 700 mg/cm² beryllium targets and four 0.14 mm thick 62x62 mm² silicon detectors. As a commissioning experiment for the target the decay of two-neutron unbound ²⁶O populated in a one-proton removal reaction from a radioactive ²⁷F beam was performed. The ²⁷F secondary radioactive beam from the NSCL's Coupled Cyclotron Facility was produced from the fragmentation of a 140 MeV/u ⁴⁸Ca beam incident on a thick beryllium target and then cleanly selected by the A1900 fragment separator. The energy loss and position spectra of the incoming beam and reaction products were used to calibrate the Silicon detectors to within 1.5% in both energy and position. A dedicated Geant4 model of the target was developed to simulate the energy loss within the target. A description of the experimental setup, simulation work, and energy and position calibration will be presented.

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