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Production of Unbound Resonance in 23O[1] JACLYN BRETT, PAUL DEYOUNG, Hope College, ALI RABEH, MATTHEW TUTTLE-TIMM, NATHAN FRANK, Augustana College, MICHAEL JONES, MICHAEL THOENNESSEN, NSCL/MSU, MONA COLLABORATION — The nuclear structure of a state in a given isotope is determined by which nucleons occupy the bound and unbound energy levels. This state determines the energy of decay, which can be calculated from the energy and momentum of the fragment and neutron. From the calculated decay energy, information about an isotope's nuclear structure can be found. At a National Superconducting Cyclotron Laboratory experiment, a 101.3 MeV/u 27Ne ion beam hit a liquid deuterium target, causing reactions which produced several isotopes. Many of these isotopes decayed, resulting in a charged fragment and one or more neutrons. A superconducting dipole magnet bent the path of the fragments into a series of charged-particle detectors. Neutrons from these decays were measured as they interacted with arrays of scintillating plastic bars. One of the isotopes produced was 22O, most likely formed in two ways in this experiment. Either α-stripping of the 27Ne beam resulted in 23O, which decayed into 22O + n or 2-proton stripping of the 27Ne beam resulted in 25O, which decayed into 22O + 3n. The cross-sections and the nature of decay for both of these processes will be determined. In addition, resonances of other unbound nuclear systems may also be included for cross-section production comparisons.

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