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Unbound Excited States of the N=16 Closed Shell Nucleus ²⁴O¹ W.F. ROGERS, Westmont College, MONA COLLABORATION — The energies of two low-lying neutron-unbound excited states of ²⁴O, which were populated by proton-knockout reactions on ²⁶F, have been measured using the MoNA and LISA arrays in combination with the Sweeper Magnet at the Coupled Cyclotron Facility at the NSCL using invariant mass spectroscopy. The current measurement confirms for the first time the separate identity of 2⁺ and (1⁺) neutron-unbound excited states in ²⁴O with decay energies 0.51(5) MeV state and 1.20(7) MeV, respectively, to the ²³O ground state. These measured decay energies are consistent with two previous lower resolution measurements to within 2σ . The level energies for the two states are computed using the decay energies and the 1-neutron separation energy for 24 O, resulting in 4.70(15) MeV for the 2^+ state and 5.39(16) MeV for the (1^+) state. Errors in the level energies are dominated by uncertainty in the ²⁴O neutron separation energy, underscoring the need for a higher resolution ²⁴O ground state mass measurement. Results will be compared with 3 phenomenological and 2 abinitio model calculations.

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