Abstract Submitted for the HAW05 Meeting of The American Physical Society

Search for the First Excited State of <sup>24</sup>O<sup>1</sup> N. FRANK, P.G. HANSEN, J.-L. LECOUEY, W.A. PETERS, A. SCHILLER, C. SIMENEL, J.R. TERRY, M. THOENNESSEN, K. YONEDA, NSCL/MSU, P. DEYOUNG, NSCL/Hope College, J. BROWN, Wabash College, J. HINNEFELD, IUSB, R. HOWES, Marquette University, R.A. KRYGER, Molecular Separation Specialists, B. LUTHER, Concordia College — The location of the first 2<sup>+</sup> excited state of <sup>24</sup>O is important evidence for the doubly magic nature of this nucleus predicted by shell model calculations. Previous searches for the first excited state of <sup>24</sup>O utilizing in-beam  $\gamma$ -ray spectroscopy have been unsuccessful indicating that the state is located above the neutron separation energy. We populated states in <sup>24</sup>O by two-proton knockout from a beam of <sup>26</sup>Ne. Neutrons were detected by the Modular Neutron Array MoNA in coincidence with <sup>23</sup>O fragments deflected by the MSU/FSU sweeper magnet and detected in a set of charged-particle detectors. The decay energy and thus the location of unbound excited states can be reconstructed from the measured energies and angles of the <sup>23</sup>O fragments and the neutrons.

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