Abstract Submitted
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Unbound states of the neutron-rich oxygen isotopes[1] C.R. HOFFMAN, S.L. TABOR, FSU, M. THOENNESSEN, T. BAUMANN, D. BAZIN, A. GADE, W.A. PETERS, A. SCHILLER, MSU/NSCL, J. BROWN, WABASH, P.A. DEYOUNG, HOPE, R. HOWES, MARQUETTE, N. FRANK, B. LUTHER, CONCORDIA, H. SCHEIT, RIKEN, J. HINNEFELD, IUSB, MONA COLLABORATION — The energies of the ground state decay of ^{25}O and excited states in ^{24}O were measured for the first time. From these energies the size of the $N = 16$ shell gap may be deduced. Due to the lack of observation of an excited state in ^{24}O using γ-ray spectroscopy, along with the known unbound nature of ^{25}O, techniques involving neutron spectroscopy had to be applied. ^{25}O (^{24}O*) was populated via proton (proton-neutron) removal from a ^{26}F beam. Complete 4-vector reconstruction revealed resonant structures in the decay spectrum for n-^{22}O, n-^{23}O and n-^{24}O coincidence events. From the n-^{24}O and n-^{23}O decay spectrum the energies of the ground state of ^{25}O and first excited state of ^{24}O were measured. Using n-^{22}O coincident events of neutron multiplicity ≥ 2, clear correlation between a low and high energy resonance was observed. With the known placement of the low energy resonance as the first excited state in ^{23}O, the high energy resonance has been attributed to an excited state in ^{24}O.

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