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Study of the ^{3}He(^{14}O,α)^{13}O reaction SCOTT MARLEY, N.J. GOODMAN, J.C. LIGHTHALL, A.H. WUOSMAA, Western Michigan University, C.L. JIANG, M. NOTANI, R.C. PARDO, K.E. REHM, J.P. SCHIFFER, X.D. TANG, Argonne National Laboratory, L. JISONNA, Northwestern University — We have studied the structure of ^{13}O through the ^{3}He(^{14}O,α)^{13}O reaction. Recent work examining the resonance elastic scattering of p + ^{12}N has provided information on the excited states of ^{13}O up to 4 MeV (B.B. Skorodumov et al., Phys. Rev. C 75, 024607 (2007)). Little is known about the excited states of this isotope at excitation energies above 6.02 MeV. Due to a low separation energy (S_p = 1.516 MeV) the most likely populated states are 1p and 2p unbound. States in ^{13}O above the alpha-particle decay threshold may also have astrophysical significance, and may influence the rate of the ^{9}C$(\alpha, p)^{12}$N reaction in dense, low metallicity stars. The ATLAS in-flight radioactive beam facility at Argonne National Laboratory produced an ^{14}O beam of 10^5 particles per second at 148 MeV. The beam bombarded a cryogenic ^{3}He target cell. Three annular segmented Si detectors detected light reaction products between θ_{lab}=8 and 48 degrees. Heavy beam-like fragments were identified using a four segment Si E-ΔE telescope covering laboratory angles between 1.4 and 7 degrees. Preliminary results will be discussed. Work supported by the U. S. Department of Energy, Office of Nuclear Physics under contracts DE-FG02-04ER41320 (WMU) and DE-AC02-06CH11357 (ANL).

Scott Marley
Western Michigan University

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