

Abstract Submitted  
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**First Measurement of the Cascade Transition via the 6.049-MeV State of  $^{16}\text{O}$  in the  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$  Reaction**<sup>1</sup> CATALIN MATEI<sup>2</sup>, C.R. BRUNE, Ohio University, L. BUCHMANN, D.A. HUTCHEON, C. RUIZ, J. CAGGIANO, A. LAIRD, Z.H. LI, A. OLIN, D. OTTEWELL, G. RUPRECHT, M. TRINCZEK, C. VOCKENHUBER, TRIUMF, J. D'AURIA, M. LAMEY, C. WREDE, Simon Fraser U., A.A. CHEN, J. PEARSON, McMaster U., W.R. HANNES, U. of Konstanz — The cascade through the 6.049-MeV state of  $^{16}\text{O}$  has rarely been discussed as contributing to the  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$  cross section at low energies largely due to experimental difficulties in observing this transition. We report here first measurements of this transition in  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$  using the DRAGON separator facility at TRIUMF. The experiment was performed in inverse kinematics with an incident  $^{12}\text{C}$  beam on a windowless  $^4\text{He}$  gas target. The coincidence setup included a BGO array around the gas target and a DSSSD detector for the detection of  $^{16}\text{O}$  recoils. The acceptance of DRAGON including the BGO array has been simulated in GEANT as well as measured directly. The transition strength has been derived and analyzed in the R-matrix formalism. We find an extrapolated value of  $S_{6.05}(300) = 25 \pm 16$  keVb showing that this transition is likely the most important cascade contribution for  $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ .

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<sup>2</sup>Present address: Oak Ridge Associated Universities, Oak Ridge, TN

Catalin Matei  
Ohio University

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