Contribution ID: **58** Type: **Oral contribution**

Measurement of the cascade cross section to the 6.049-MeV state in 16O in 12C(a,g)16O

Tuesday 27 June 2006 18:15 (15 minutes)

The cascade through the 6.049-MeV J(pi)=0+ state 16O of has rarely been discussed as contributing to the 12C(a,g)16O cross section at low energies largely due to experimental difficulties in observing this transition. We report here first measurements of this transition in 12C(a,g)16O using the DRAGON recoil separator facility at TRIUMF. The experiment was performed in inverse kinematics with an incident 12C beam on a windowless 4He gas target, covering center of mass energies between 2.2 MeV and 5.42 MeV. The coincidence setup included a BGO array around the gas target and a DSSS Detector for the detection of 16O recoil particles at the focal plane of DRAGON. To derive actual cross sections, the acceptance of DRAGON including the BGO array has been simulated in GEANT.

The transition strength has been derived and analyzed in the R-matrix formalism. Information on the 6.92-MeV cascade transition and the ground state transition were also obtained from the same data set. We derived the 12C(a,g)16O total cross section and found it in good agreement with a recently reported measurement

Author: MATEI, C. (Ohio University, Athens, OH)

Co-authors: CHEN, A. A. (McMaster University, Hamilton, Ontario, Canada); BRUNE, C. R. (Ohio University, Athens, OH); RUIZ, C. (Simon Fraser University, Burnaby, British Columbia, Canada); VOCKENHUBER, C. (Simon Fraser University, Burnaby, British Columbia, Canada); WREDE, C. (Simon Fraser University, Burnaby, British Columbia, Canada); HUTCHEON, D. A. (TRIUMF, 4004 Wesbrook Mall, Vancouver, British Columbia, Canada, V6T 2A3); OTTEWELL, D. (TRIUMF, 4004 Wesbrook Mall, Vancouver, British Columbia, Canada, V6T 2A3); RUPRECHT, G. (TRIUMF, 4004 Wesbrook Mall, Vancouver, British Columbia, Canada, V6T 2A3); D'AURIA, J. (Simon Fraser University, Burnaby, British Columbia, Canada); PEARSON, J. (McMaster University, Hamilton, Ontario, Canada); BUCHMANN, L. (TRIUMF, 4004 Wesbrook Mall, Vancouver, British Columbia, Canada, V6T 2A3); LAMEY, M. (Simon Fraser University, Burnaby, British Columbia, Canada); TRINCZEK, M. (Simon Fraser University, Burnaby, British Columbia, Canada); LIU, WP. (China Institute of Atomic Energy, Beijing, P. R. China); HANNES, WR. (University of Konstanz, Department of Physics, Germany); LI, ZH. (TRIUMF, 4004 Wesbrook Mall, Vancouver, British Columbia, Canada, V6T 2A3)

Presenter: MATEI, C. (Ohio University, Athens, OH)

Session Classification: 8 Experiments in nuclear astrophysics II

Track Classification: Experiments in nuclear astrophysics