Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Absolute normalization of the $^{13}C(\alpha,n)^{16}O$ cross section and resonance strengths below $E_\alpha = 2$ MeV[1] CARL R. BRUNE, KRISTYN BRANDENBURG, THOMAS N. MASSEY, ZACH MEISEL, ALEXANDER V. VOINOV, Ohio University — The $^{13}C(\alpha,n)^{16}O$ reaction is important as a neutron source for s-process nucleosynthesis and as a background in detectors used for reactor antineutrino and geoneutrino detection. The time-reversed process $^{16}O(n,\alpha)^{13}C$ is likewise important in neutron applications. In all of these scenarios, it is desirable to know the absolute cross section as well as possible. We have revisited previous measurements of this reaction that were performed using a polyethylene moderator and ^{3}He-filled proportional counters for neutron detection [C.R. Brune *et al.*, Phys. Rev. C **45**, 1382 (1992); *ibid* **48**, 3119 (1993)]. Subsequent to these publications, the efficiency of the neutron detector was accurately characterized using a combination of Monte Carlo simulations and calibrated neutron sources. The Monte Carlo simulations include the effects of the reaction's kinematics and angular distribution on the efficiency. We have conducted a re-analysis of the above measurements using this improved detector efficiency. These reanalyzed data will be compared with existing measurements below $E_\alpha = 2$ MeV.

[1]Supported in part by U.S. D.O.E. under grant Nos. DE-FG02-88ER40387 and DE-NA0002905.

Carl Brune
Ohio Univ

Date submitted: 12 Jan 2018 Electronic form version 1.4