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**Measurement of the 13C(,n)16O reaction with implications for neutrino mixing, and geo-neutrino measurements**[1] MICHAEL FEBBRARO, Oak Ridge National Lab, JAMES DEBOER, University of Notre Dame, KEVIN MACON, Louisiana State University , STEVEN PAIN, KELLY CHIPPS, Oak Ridge National Lab, REBECCA TOOMEY, Rutgers University — The $^{13}C(\alpha, n)^{16}O$ reaction has a broad range of implications ranging from nuclear astrophysics to nuclear non-proliferation and reactors to geoneutrino and neutrino mixing measurements. It was noted by W.Peters (PRC96, 029801) that the population of excited states and the effects of neutron detection efficiency could affect the interpretation of previous results. These comments were supported by statistical model calculations by P. Mohr (PRC97, 064613). In this talk, we will present results from a neutron spectroscopic measurement of the $^{13}C(\alpha, n)^{16}O$ reaction between $E_\alpha$ = 3.5 and 7.5 MeV which spans this important threshold region for population to the excited states. Neutron spectroscopy was performed using spectrum unfolding technique using deuterated liquid scintillators which provided clean separation of ground state and excited state contributions. Implications on uses of this reaction pertaining to neutrino physics measurements will be discussed.

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Michael Febbraro
Oak Ridge National Lab

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