Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Forward Propagation Analysis for determining the 16O(n,alpha)13C Reaction Cross Section at LANSCE.[1] ZACHARY PURCELL, Central Michigan University/LANL, HYE YOUNG LEE, LANL, JACOB DAVISON, Central Michigan University — Oxygen is present in many materials and the uncertainties in its nuclear data can have a significant impact on applications. In particular, neutron-absorption reactions reduceavailable neutrons in applications. Thus,high precision in knowledge of this reaction cross sectionis required. To decreasethe systematic uncertainty, we developed a framework that uses Forward Propagation Analysis (FPA) for determining the 16O(n,a)13C reaction cross section from data measured at LANSCE. The Low Energy NZ (LENZ) instrument was used to detectreaction alphas on the Ta2O5 solid target with silicon strip detectors. The FPA was performed in GEANT4. The geometry, efficiency, and resolution functions of LENZ werevalidated by comparing with the alpha emitting Th-229 source measurement. To reproduce experimental yields in silicon strip detectors, the energy dependent neutron beam flux distribution, the 16O(n,a) reaction differential cross sections, and the 2-body kinematics calculations were implemented in the simulation. We present results from the FPA on LENZ data anddiscuss the improved data analysis [LA-UR-17-26436].

[1]This work has benefited from the use of the Los Alamos Neutron Science Center, is funded by the US Department of Energy and operated by Los Alamos National Security, LLC under contract DE-AC52-06NA25396.

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Date submitted: 28 Jul 2017 Electronic form version 1.4