Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

12C(n, 2n)11C Reaction Cross Section Measurements for Bombarding Energies 20-26.4 MeV MOLLIE BIENSTOCK, M. RUSS, STEVEN PADALINO, A. SIMONE, D. ELLISON, H. DESMITT, SUNY Geneseo, M. YULY, I. LOVE, G. HARTSHAW, Houghton College, T. MASSEY, Ohio University, C. SANGSTER, Laboratory for Laser Energetics — The (n,2n) threshold for 12C is nearly 6MeV above the primary neutron energy in DT ICF implosions. This makes it a good candidate for measuring the tertiary neutron yield above 20MeV using neutron activation of graphite. In order to use this method the 12C(n,2n)11C reaction cross section must be known accurately. However, the published data for this reaction is bifurcated in the energy range of 20-30MeV. An experiment to measure the cross section for these neutron energies has been performed at the Ohio University Accelerator. Deuterons from the accelerator struck a titanium tritide foil releasing neutrons via the T(d,n)4He reaction producing neutrons with energies between 20.0-26.4MeV. The geometry of the experiment was chosen so that the incident neutron energy would not vary by more than 0.5MeV across the graphite target. After neutron exposure, the decay of the 11C nuclei by positron emission was measured with an array of NaI detectors to determine the activity of the graphite. The neutron fluence through the carbon was measured using a particle telescope to detect recoil protons from CH2 target, allowing the absolute cross section for the 12C(n,2n)11C reaction to be determined. Funded in part by a LLE contract from the DOE

Megan Russ
SUNY Geneseo

Date submitted: 12 Jul 2013 Electronic form version 1.4