Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Gamma-gamma Counting Station dead time corrections ANGELA SIMONE, MEGAN RUSS, MOLLIE BIENSTOCK, STEVEN PADALINO, DREW ELLISON, HOLLY DESMITT, State University of New York at Geneseo, CRAIG SANGSTER, Laboratory for Laser Energetics, STATE UNIVERSITY OF NEW YORK AT GENESEO COLLABORATION, LABORATORY FOR LASER ENERGETICS COLLABORATION — It has been proposed that neutron activation of graphite could be used to measure tertiary neutron production in ICF experiments. Graphite samples were activated by 20-26.4 MeV neutrons at the Edwards Accelerator Facility at Ohio University to simulate an ICF activation. Once activated by the 12C(n,2n)11C reaction the 11C decays via positron emission. The positron promptly annihilates with an electron producing two back-to-back gamma rays. A counting station consisting of a pair of onaxis NaI(Tl) detectors was constructed to measure the 511 keV gammas in coincidence. Due to the high initial specific activity of the graphite samples following intense neutron bombardment the dead time in the NaI-Thl detectors was high but tapered off over the duration of measurement. In order to correct for lost counts in the decay curve the dead-time as a function of dwell time must be known. A script was written to sort dead-time from the acquired data as a function of dwell time interval. These values were then used to correct the measured decay curve which produced an exceptionally good fit to the theoretical decay curve. Ultimately this information was used to determine the total number of activations in the graphite samples. Funded in part by a LLE contract through the DOE

Megan Russ
State University of New York at Geneseo

Date submitted: 12 Jul 2013 Electronic form version 1.4