Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

TNSA Heavy Ion Measurements using the Time-Resolved Tandem Faraday Cup M.K. GINNANE, B. KOUSAR, J. SLISH, K. PALMISANO, S. MANDANAS, S.J. PADALINO, State Univ of NY - Geneseo, T.C. SANGSTER, S. REGAN, C. MILEHAM, C. STOECKL, Laboratory for Laser Energetics — The MTW Laser at LLE utilizes an ultra-intense laser to produce high-energy heavy ion pulses through Target Normal Sheath Acceleration (TNSA). Using the Time-Resolved Tandem Faraday Cup (TRTF) the total number of heavy ions produced by TNSA can be determined, which is needed for stellar nuclear reaction cross section measurements. TNSA heavy ions stop within the thin walled front cup, while light ions pass through it and deposit their remaining charge in the back cup. A two channel storage scope measures voltages produced by the beam currents collected in the cups, respectively. The charge state fraction of plasma ions is modified by passing the heavy ions through a charge-exchange foil at the TRTF entrance. While passing through the foil, ions equilibrate to known charge states based on their velocities. Using time of flight, the total heavy ion current can be normalized to the correct charge state fraction. A pair of dipole magnets deflect relativistic TNSA electrons from the cups entrance. They also prevent secondary electrons from escaping the front and back cups. Funded in part by a LLE contract through the DOE.

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Date submitted: 14 Jul 2016 Electronic form version 1.4