

Abstract Submitted
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Calibration of a Thomson parabola ion spectrometer and Fujifilm imaging plates for energetic protons, deuterons, and alpha particles¹ CHARLES FREEMAN, MICHAEL CANFIELD, GAVIN GRAEPER, ANDREW LOMBARDO, COLLIN STILLMAN, SUNY Geneseo, GENNADY FIKSEL, CHRISTIAN STOECKL, Laboratory for Laser Energetics, NAREG SINE-
NIAN, Massachusetts Institute of Technology — A Thomson parabola ion spectrometer (TPIS) has been designed and built to study energetic ions accelerated from the rear surface of targets irradiated by ultra-intense laser light from the Multiterawatt (MTW) laser facility at the Laboratory for Laser Energetics (LLE). The device uses a permanent magnet and a pair of electrostatic deflector plates to produce parallel magnetic and electric fields, which cause ions of a given charge-to-mass ratio to be deflected onto parabolic curves on the detector plane. The position of the ion along the parabola can be used to determine its energy. Fujifilm imaging plates (IP) are placed in the rear of the device and are used to detect the incident ions. The energy dispersion of the spectrometer has been calibrated using monoenergetic ion beams from the SUNY Geneseo 1.7 MV pelletron accelerator. The IP sensitivity has been measured for protons and deuterons with energies between 0.6 MeV and 3.4 MeV, and for alpha particles with energies between 1.5 MeV and 5.1 MeV.

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