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Calibration of a Thomson parabola ion spectrometer using proton beams from a pelletron accelerator MICHAEL CANFIELD, ANDREW LOMBARDO, GAVIN GRAEPER, COLLIN STILLMAN, CHARLES FREEMAN, SUNY Geneseo, GENNADY FIKSEL, CHRISTIAN STOECKL, Laboratory for Laser Energetics, NAREG SINENIAN, Massachusetts Institute of Technology — The position-to-energy calibration of a Thomson parabola ion spectrometer (TPIS) was measured using proton beams from the 1.7 MV tandem pelletron accelerator at SUNY Geneseo. The TPIS was designed for use on the multiterawatt (MTW) laser facility at the Laboratory for Laser Energetics (LLE). The TPIS implements parallel electric and magnetic fields to separate ions of a given mass-to-charge ratio onto parabolic curves on the detector plane. The position of the ions along the parabola is used to determine the ions' energy. Monoenergetic proton beams with energies between approximately 1 and 3 MeV were directed into the TPIS. Both radiochromic film (RCF) and Fujifilm imaging plates (IP) were placed at the rear of the TPIS and were used to detect the protons. The horizontal deflection due to the electrostatic plates and the vertical deflection due to the permanent magnetic field were studied as a function of the proton energy. This research was funded in part by DOE.

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