Abstract Submitted
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Compact energy selector for use with intense, short-pulse laser produced proton beams[1] ANDREW HAZI, HUI CHEN, FREDERIC PEREZ, EDWARD MARLEY, JAEBUM PARK, JACKSON WILLIAMS, LLNL, LAURA VASSURA, JULIEN FUCHS, SOPHIA CHEN, LULI, RONNIE SHEPHERD, LLNL — Irradiation of thin solid targets with short, intense laser pulses produces energetic charged particles. The proton and ion beams generated from such laser-plasma interactions have several attractive features, but usually exhibit a broad energy distribution extending up to tens of MeV. However for some applications, such as energy-loss measurements in plasmas or injection into high-energy accelerators, quasi-mono energetic beams are preferred [1]. We have designed, built and tested a small (9 x 7 x 5 cm^3) energy selector for use with laser-produced proton beams in beam-plasma interaction experiments that utilize multiple laser beams. The device uses permanent magnets in a dipole configuration, with a fixed entrance aperture and an adjustable exit slit to select a narrow portion of the broad energy distribution in the beam. The energy selector was tested in a recent experiment at the Titan laser at Livermore. Sample data from the experiment and simulations of the device's characteristics will be presented.

[1] T. Toncian, et al., "Ultrafast Laser–Driven Microlens to Focus and Energy-Select Mega–Electron Volt Protons," Science, 312, 410 (2006).

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