

Abstract Submitted
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Above-60-MeV proton acceleration with a 150 TW laser system¹

M. SCHOLLMEIER, M. GEISSEL, A.B. SEFKOW, P. RAMBO, J. SCHWARZ, B.W. ATHERTON, Sandia National Laboratories — Laser-accelerated proton beams can be used in a variety of applications, e.g. ultrafast radiography of dense objects or strong electromagnetic fields. Therefore high energies of tens of MeV are required. We report on proton-acceleration experiments with a 150 TW laser system using mm-sized thin foils and mass-reduced targets of various thicknesses. Thin-foil targets yielded maximum energies of 50 MeV. A further reduction of the target dimensions from mm-size to $250 \times 250 \times 25$ microns increased the maximum proton energy to >65 MeV, which is comparable to proton energies measured only at higher-energy, Petawatt-class laser systems. The dependence of the maximum energy on target dimensions was investigated, and differences between mm-sized thin foils and mass-reduced targets will be reported.

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