

Abstract Submitted  
for the DPP10 Meeting of  
The American Physical Society

**Measurements of Proton Generation with Intense, Kilojoule Laser Pulses on OMEGA EP** L. GAO, P.M. NILSON, W. THEOBALD, C. STOECKL, C. DORRER, T.C. SANGSTER, D.D. MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester, L. WILLINGALE, K.M. KRUSHELNICK, CUOS, U. of Michigan — The scaling of energetic-proton generation by intense, high-energy laser pulses with laser energy will be presented. Energetic protons have been generated by target-normal sheath acceleration in intense laser–solid interactions on OMEGA EP with up to 2100-J, 10-ps-long laser pulses. Nuclear activation of copper-film stacks is used to determine the energy spectrum of the forward-accelerated protons. The results show that the maximum proton energy is proportional to  $E^{0.5}$ , with maximum proton energy greater than 50 MeV for a typical 1000-J, 10-ps shot. The conversion efficiency from laser energy to total proton beam energy is proportional to the laser energy, with about 2% of the laser energy converted into protons with energies greater than 4 MeV at 1000 J. The experimental data extends previous work to higher laser energies and is in good agreement with it. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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Date submitted: 12 Jul 2010

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