Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Influence of plasma density on the generation of 100s MeV electrons via Direct Laser Acceleration[1] AMINA HUSSEIN, T. BATSON, Univ of Michigan - Ann Arbor, A.V. AREFIEV, UCSD, H. CHEN, R.S. CRAXTON, A. DAVIES, D.H. FROULA, D. HABERBERGER, LLE, O. JANSEN, UCSD, K. KRUSHELNICK, Univ of Michigan - Ann Arbor, P.M. NILSON, W. THEOBALD, LLE, T. WANG, UCSD, G.J. WILLIAMS, LLNL, L. WILLINGALE, Univ of Michigan - Ann Arbor — The role of plasma density and quasi-static fields in the acceleration of electrons to many times the ponderomotive energies (exceeding 400 MeV) by high-energy, picosecond duration laser pulses via Direct Laser Acceleration (DLA) from underdense CH plasma was investigated. Experiments using the OMEGA EP laser facility and two-dimensional particle-in-cell simulations using the EPOCH code were performed. The existence of an optimal plasma density for the generation of high-energy, low-divergence electron beams is demonstrated. The role of quasi-static channel fields on electron energy enhancement, beam pointing and divergence elucidate the mechanisms and action of DLA at different plasma densities.

[1]This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-FOA-0001109.

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Date submitted: 11 Jul 2017 Electronic form version 1.4