Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

PIC Simulations of direct laser accelerated electron from underdense plasmas using the OMEGA EP Laser AMINA HUSSEIN, THOMAS BATSON, KARL KRUSHELNICK, Univ of Michigan - Ann Arbor, LOUISE WILLINGALE, University of Lancaster, ALEX AREFIEV, TAO WANG, University of Texas, Austin, PHIL NILSON, DUSTIN FROULA, DAN HABERBERGER, ANDREW DAVIES, WOLFGANG THEOBALD, Lab for Laser Energetics, University of Rochester, JACKSON WILLIAMS, HUI CHEN, Lawrence Livermore National Lab — The OMEGA EP laser system is used to study channeling phenomena and direct laser acceleration (DLA) through an underdense plasma. The interaction of a ps laser pulse with a subcritical density CH plasma plume results in the expulsion of electron along the laser axis, forming a positively charged channel. Electrons confined within this channel are subject to the action of the laser field as well as the transverse electric field of the channel, resulting the DLA of these electrons and the formation of a high energy electron beam. We have performed 2D simulations of ultra-intense laser radiation with underdense plasma using the PIC code EPOCH to investigate electron densities and self-consistently generated electric fields, as well as electron trajectories. This work was supported by the National Laser Users' Facility (NLUF), DOE.

Amina Hussein
Univ of Michigan - Ann Arbor

Date submitted: 15 Jul 2016 Electronic form version 1.4