Abstract Submitted
for the APR08 Meeting of
The American Physical Society

High Intensity Laser Coupling to a Cone Geometry for Fast Ignition[1] R.B. STEPHENS, K.U. AKLI, General Atomics, A.J. MACKINNON, M.H. KEY, A. MACPHEE, Y. PING, Lawrence Livermore National Lab, D. OFFERMAN, D. CLARK, R.R. FREEMAN, T. LINK, V. OVCHINNIKOV, L. VANWOERKOM, The Ohio State U., T. BARTAL, F. BEG, S. CHAWLA, R.R. FREEMAN, J.A. KING, T. MA, M.S. WEI, UCSD, C. CHEN, MIT, D. HEY, UC-Davis, Y. TSU, U. Alberta — The short -pulse laser, which ignites a fast ignition target, gains access to the compressed core through a reentrant cone that maintains a clear path through the blow-off plasma. The interaction of the laser with the cone surface is complex due to light and electron focusing by the cone walls. Furthermore, plasma produced by the prepulse can affect the interaction physics and electron transport. We report on experiments to study this, performed using Titan Laser facility (2×10^{20} W cm^{-2}). We imaged Cu K_α fluorescence in flat foils to show for the first time that the laser-generated electrons from glancing incidence light have no significant forward direction. Fluorescence images from cones support this conclusion, showing the electrons spread essentially randomly up to several hundred microns from a cone tip independent of focus conditions.

[1]Work was performed under the auspices of the US Department of Energy under DE-FG02-05ER54834 and W-7405-ENG-48.

R.B. Stephens
General Atomics

Date submitted: 17 Jan 2008 Electronic form version 1.4