

Abstract Submitted  
for the DPP08 Meeting of  
The American Physical Society

**Hot electron energy coupling in ultra-intense laser matter interaction**<sup>1</sup> ANDREAS KEMP, LLNL, YASUHIKO SENTOKU, UNR, MAX TABAK, LLNL — We investigate the response of plasma gradients during the interaction with ultra-intense energetic laser pulses, using kinetic particle simulations. Energetic laser pulses are capable of compressing preformed plasma gradients over short times, while accelerating low density plasma backwards. As light is absorbed on a steepened interface, hot electron temperature and coupling efficiency drop below the ponderomotive scaling, and we are left with a new absorption mechanism that strongly relies on the electrostatic potential caused by low density preformed plasma. We describe this process, explain electron spectra and identify the parameter regime where strong compression occurs. Finally, we discuss implications for fast ignition and other applications.

<sup>1</sup>This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Andreas Kemp  
LLNL

Date submitted: 17 Jul 2008

Electronic form version 1.4