Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Interaction of intense laser pulses with plasma gradients at fast-ignition scales[1] ANDREAS KEMP, LAURENT DIVOL, LLNL — Fast ignition depends on the efficient conversion from picosecond-scale intense laser pulses into MeV electrons to heat the compressed core of an inertial confinement fusion target. We study the interaction of multi-picosecond, intense laser pulses with plasma density gradients, using full-scale particle-in-cell simulations. We find that, in contrast to the diffraction-limited sub-ps laser pulses used in experiments today, the long-energetic-large-spot pulses relevant to fast ignition create over a few picoseconds a plasma profile and a hot electron spectrum that are nearly independent of the initial conditions. We discuss scaling properties with laser intensity, spot size and plasma scale length.

[1]This work was performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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Date submitted: 16 Jul 2010 Electronic form version 1.4