Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Stimulated Brillouin Scattering in Shock Ignition[1] LIANG HAO, JUN LI, WENDA LIU, RUI YAN, CHUANG REN, University of Rochester — We study laser-plasma interactions and hot electron generation for shock ignition using both fluid and PIC simulations. Typical parameters for OMEGA experiments are used with a density scale length of 170 μm and a pulse length of $\sim$ 15 ps. A series of simulations with laser intensities between 2×10^{15} and 5×10^{16} W/cm^2 finds that stimulated Brillouin scattering (SBS) increases significantly with the incident intensity, limiting the transmitted intensity at the $0.17n_c$ to be under 3×10^{15} W/cm^2. It is also found that proper modeling of the SBS reflectivity requires realistic flow profiles and seed levels for the electromagnetic fields. The majority of the hot electrons are found to be from stimulated Raman scattering and of moderate energies. However, high energy electrons of preheating threat can still be generated from the two-plasmon-decay instability.

[1]This work was supported by DOE under Grant No. DE-FC02-04ER54789 and DE-SC0012316; by NSF under Grant No. PHY-1314734; and by NSCF under Grant No. 11129503

Jun Li
University of Rochester

Date submitted: 21 Jul 2015 Electronic form version 1.4