Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Inline Modeling of Cross-Beam Energy Transfer and Backscatter in Hohlraums[1] D.J. STROZZI, S.M. SEPKE, G.D. KERBEL, P. MICHEL, M.M. MARINAK, O.S. JONES, LLNL — NIF Ignition experiments with gas-filled hohlraums use significant cross-beam energy transfer (CBET) to control implosion symmetry. They also display substantial stimulated Raman backscatter (SRS) from inner laser beams, and associated "hot" electrons. The radiation-hydrodynamics code HYDRA has been extended to include inline models for CBET and SRS. Coupled-mode equations in the strong damping limit (with linear, kinetic gain rates) are solved along the entire path of incident laser rays. Driven ion-acoustic and Langmuir waves, and inverse-bremsstrahlung absorption, are treated. The inline model includes heating by CBET-driven ion waves, which reduces subsequent CBET.[2] SRS developing inside the target leads to more heating of the underdense fill - and more depletion of the inner beams reaching the hohlraum wall - than removing the escaping SRS light from the incident laser. Thus, SRS also modifies the plasma conditions so as to limit CBET. We compare inline results with post-processing CBET calculations on plasma conditions from simulations that do not include CBET or SRS.

[1]Prepared by LLNSL under Contract DE-AC52-07NA27344.
[2]P. Michel et al., Phys. Rev. Lett. 109, 195004 (2012)

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Date submitted: 10 Jul 2014 Electronic form version 1.4