Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Hohlraum Modeling of Hybrid Shock Ignition Target[1] E.S. DODD, J.A. BAUMGAERTEL, E.N. LOOMIS, Los Alamos Natl Lab — Hybrid Shock Ignition (HSI) combines a hohlraum driven capsule with a directly driven shock for heating. Unlike standard Shock Ignition, the capsule is imploded with X-rays from a laser driven hohlraum to compress the fuel, which is too cold to ignite. However, as in Shock Ignition, the compressed fuel is subsequently heated to ignition temperatures with a directly-driven shock. The use of indirect and direct drive in the same target necessitates complex beam geometry, and thus HSI is being pursued with spherical hohlraums. More importantly for the NIF, the beam repointing required for polar direct drive will not be needed for the implosion phase with this target. Spherical hohlraums have been fielded previously at the OMEGA laser [1] as a part of the Tetrahedral Hohlraum Campaign. They were originally proposed as an alternative to cylindrical hohlraums to achieve highly symmetric radiation drive. The new HSI hohlraums will require six laser entrance holes in hexahedral symmetry to accommodate all beams. This presentation will show radiation-hydrodynamic calculations of the current hexahedral OMEGA hohlraum design, as well as benchmark calculations of the old tetrahedral targets.

[1] J. M. Wallace, T. J. Murphy, N. D. Delamater, et al., Phys. Rev. Lett., 82 3807 (1999).

[1]Supported under the U. S. DOE by the Los Alamos National Security, LLC under contract DE-AC52-06NA25396. LA-UR-14-24945.

Evan Dodd
Los Alamos Natl Lab

Date submitted: 02 Jul 2014 Electronic form version 1.4