Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Optimizing the hohlraum gas density for better symmetry control of indirect drive implosion experiments[1] NOBUHIKO IZUMI, G.N. HALL, S.R. NAGEL, S. KHAN, R.R. RYGG, A.J. MACKINNON, D.D. HO, L. BERZAK HOPKINS, O.S. JONES, R.P.J. TOWN, D.K. BRADLEY, Lawrence Livermore Natl Lab — To achieve a spherically symmetric implosion, control of drive uniformity is essential. Both the ablation pressure and the mass ablation rate on the capsule surface should be made as uniform as possible for the duration of the drive. For an indirect drive implosion, the drive uniformity changes during the pulse because of: (1) the dynamic movement of the laser spots due to blow-off of the hohlraum wall, and (2) cross-beam energy transfer caused by laser-plasma interaction in the hohlraum. To tamp the wall blow-off, we use gas filled hohlraums. The cross-beam energy transfer can be controlled by applying a wave length separation between the cones of the laser beams. However, both of those dynamic effects are sensitive to the initial density of the hohlraum gas fill. To assess this, we performed implosion experiments with different hohlraum gas densities and tested the effect on drive asymmetry. The uniformity of the acceleration was measured by in-flight x-ray backlit imaging of the capsule. The uniformity of the core assembly was observed by imaging the self emission x-ray from the core. We will report on the experimental results and compare them to hydrodynamic simulations.

[1]Prepared by LLNL under Contract DE-AC52-07NA27344. LLNL-ABS-626372

Nobuhiko Izumi
Lawrence Livermore Natl Lab

Date submitted: 10 Jul 2014 Electronic form version 1.4