Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Hohlraum fill gas density scaling of x-ray drive, symmetry, and laser coupling backscatter in 6.72-mm NIF hohlraums[1] OGDEN JONES, N. IZUMI, L.B. HOPKINS, D.J. STROZZI, P.A. AMENDT, G.N. HALL, D.D. HO, S.F. KHAN, N.B. MEEZAN, J.D. MOODY, S.R. NAGEL, J.E. RALPH, R.P.J. TOWN, LLNL — Most ignition experiments carried out on the NIF to date have used hohlraums with helium gas fill at 1-1.6 mg/cc density in order to prevent excessive hohlraum wall motion and help to control drive symmetry. A unique feature of 2-shock high density carbon (HDC) ignition designs is that they require a much shorter ($\sim$ 7 ns) laser pulse than the $\sim$ 20 ns duration pulses that are typically used for 3-shock or 4-shock CH ablator designs, so there is less time for the wall to move. As a result, it is possible to reduce the hohlraum gas fill density. We have done 2D convergent ablator experiments in a 6.72 mm diameter hohlraum at fill densities of 0.03 and 0.6 mg/cc. These experiments used HDC capsules driven by a 1.5 MJ, 370 TW peak power laser pulse. They demonstrated low backscatter (<4%) and effective drives that are much closer to high flux model predictions than for typical gas-filled hohlraums. The 0.6 mg/cc fill reduced the amount of unabsorbed inner cone power that is reflected out of the hohlraum for the 0.03 mg/cc case. Also, the 0.6 mg/cc has improved symmetry that is in good agreement with modeling.

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

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Date submitted: 11 Jul 2014 Electronic form version 1.4