Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Room-temperature, ignition-scale hohlraum experiments on NIF[1] D.J. STROZZI, J.E. RALPH, T. MA, D.E. HINKEL, D.A. CALLAHAN, J.L. KLINE, J.D. MOODY, O. JONES, J.R. RYGG, G.D. KERBEL, M.M. MARINAK, LLNL, S.H. GLENZER, SLAC National Accelerator Center — We have fielded six shots (symmetry capsules and convergent ablators) to develop a room-temperature ("warm") ignition-scale platform. These have lower cost than cryogenic (< 30 K) shots, and allow higher-Z hohlraum and capsule fill gases. Compared to the cryo He hohlraum fill, the warm neopentane fill (C_5H_{12}) produces comparable x-ray drive, but requires less cross-beam energy transfer to achieve a round implosion "hot spot." The higher Z results in a hotter plasma, which appears to reduce Raman scattering from the inner beams. Warm shots also have more outer-beam Brillouin scattering. In-flight measurements of the shell show a positive P_4 Legendre mode (diamond shape) in both warm and cryo shots, consistent with predictions from the radiation-hydrodynamics code Hydra. The code also predicts a negative P_4 (square) hot spot shape for both warm and cryo shots, but only warm shots typically exhibit this. Improved Hydra modeling is being applied to the warm shots, including a self-consistent, inline package for energy transfer and backscatter. The warm capsule fill has been nominal or deuterated (C_3D_8) propane, giving $> 2x10^{11}$ neutrons. The hot spot is cooler in warm than in cryo shots (D-He^3 fill) due to increased radiation from hot-spot C.

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

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Date submitted: 11 Jul 2013 Electronic form version 1.4