Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Evaluation of the First Polar-Drive, DT-Gas–Filled Target Implosions on the NIF P.W. MCKENTY, R.S. CRAXTON, A. SHVYDKY, F.J. MARSHALL, R.L. MCCRORY, Laboratory for Laser Energetics, U. of Rochester, J.D. KILKENNY, A. NIKROO, M.L. HOPPE, General Atomics, A.J. MACKINNON, M.J. EDWARDS, LLNL — Polar-drive (PD) target implosions using DT fuel have been designed and fielded for neutron diagnostic development on the NIF. The experiments use thin, room-temperature glass shells filled with low pressures (10 atm) of DT. Initial target implosions on the NIF are expected to produce DT yields in the range of a few 10^{14} neutrons. The predicted yields are consistent with earlier data (10^{14} neutrons at 30 kJ) and recent PD-scoping experiments performed on OMEGA. The experiments used existing x-ray-drive phase plates with judicious repointing and defocusing to drive the implosions as uniformly as possible. These implosions are modeled with three separate hydrodynamics codes: *LILAC*, to optimize the 1-D design; *SAGE*, to optimize the pointing uniformity; and *DRACO*, to predict the yield from 2-D implosion simulations. Experimental results evaluating the yield performance and the overall hydrodynamic assembly of the implosions (as recorded on x-ray diagnostics) will be compared to simulations results and post-processed Spect3D analysis of the implosion. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

P.W. McKenty
Laboratory for Laser Energetics, U. of Rochester

Date submitted: 07 Jul 2010 Electronic form version 1.4