Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Laser-Direct-Drive Energy-Coupling Experiments Using Spherical Solid-Plastic Targets on the NIF[1] S.P. REGAN, W. THEOBALD, P.B. RADHA, R. BETTI, M.J. ROSENBERG, K.S. ANDERSON, J.A. MAROZAS, T.J.B. COLLINS, V.N. GONCHAROV, LLE, Univ. of Rochester, D. TURNBULL, LLE, University of Rochester, C.M. SHULDBERG, R.W. LUO, General Atomics, R. HEREDIA, LLNL, R. SCOTT, K. GLIZE, Rutherford Appelton Laboratory, B. BACHMANN, T. DOEPPNER, M. HOHENBERGER, LLNL, A. COLAITIS, A. CASNER, CELIA, Univ. of Bordeaux, E.M. CAMPBELL, LLE, Univ. of Rochester — Energy-coupling experiments relevant to laser-direct-drive (LDD) ignition-target designs are being conducted on the National Ignition Facility (NIF) using a spherical, solid-plastic target with a 2.1 mm diam. One hundred eighty-four NIF laser beams having total energy of 0.5 MJ irradiated the target in a Polar-Direct-Drive (PDD) geometry with a peak intensity of 8×10^{14} W/cm^2. The trajectory of the spherically-converging shock wave was recorded using gated, x-ray backlighting at 8.4-keV. Solid spheres offer the advantage for quantifying energy coupling without the challenges from hydrodynamic instabilities of thin shell implosions or kinetic effects in exploding pushers. Initial shock-trajectory measurements will be presented and compared with 2-D *DRACO* radiation-hydrodynamics simulations using CBET and nonlocal heat-transport models. The overarching goal is to test the scaling arguments of PDD implosions from the 20-kJ OMEGA (configured for PDD) to the 2.1 MJ NIF.

[1]This material is based upon work supported by the DOE National Nuclear Security Administration under Award Number DE-NA0003856.

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Date submitted: 29 Jun 2020 Electronic form version 1.4