Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Shock-Timing Measurements in ICF Targets Filled with Liquid Deuterium THOMAS BOEHLY, VALERI GONCHAROV, MARIA BARRIOS, DAYNE FRANTANDUONO, SUXING HU, TIMOTHY COLLINS, JOHN MOROZAS, THOMAS SANGSTER, DAVID MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester, PETER CELLIERS, HARRY ROBEY, DAMIEN HICKS, GILBERT COLLINS, LLNL — High-performance ICF target designs use multiple shocks to condition the shell before it is imploded. Accurate timing of these shocks is critical to target performance. We report on experiments on the OMEGA Laser where up to four spherical shocks were observed in directly driven spherical targets filled with liquid deuterium. The measured shock velocity profiles exhibit the coalescence times of those shock and contain the first observations of convergence effect (pressure increase with decreasing radius) and the highest shock velocity observed in liquid deuterium (135 km/s). Simulations of these experiments accurately model the shock velocities and timing when a non-local electron transport model is used for heat conduction. These experiments are the basis for tuning campaigns performed on the National Ignition Facility to tune laser pulse shape to achieve the specifications for ignition targets. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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Date submitted: 15 Feb 2011 Electronic form version 1.4