

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Oblique Shock Experiments on the OMEGA-EP Laser¹

JONATHAN HAGER, KIRK FLIPPO, FORREST DOSS, JOHN KLINE, Los Alamos National Laboratory, WESLEY WAN, CARLOS DI STEFANO, CAROLYN KURANZ, PAUL DRAKE, University of Michigan — In inertial confinement fusion (ICF), understanding the evolution of hydrodynamic instability growth is an essential part of designing an implosion target that is robust to mix between the cold target shell and the hot fusion core. Early in time, shocks traversing the target amplify seed modulations through the slow growing Richtmyer-Meshkov (RM) and Kelvin-Helmholtz (KH) instabilities. These instabilities seed the faster growing Rayleigh-Taylor (RT) instability during the acceleration and deceleration phases of the implosion. We present an experimental platform designed to investigate coupling between the RM and KH instabilities by launching a planar shock through a polyamide-imide cylinder on the OMEGA-EP laser. The rear surface of the target has a single mode sinusoidal seed modulation that is machined on an interface that is at an angle with respect to the planar shock, creating an oblique shock breakout. The evolution of the rear surface modulation is measured using side-on x-ray radiography with a spherical crystal imager backlight by a copper k-alpha source. Experimental data will be presented along with comparisons with 1-D and 2-D simulation predictions.

¹This work performed under the auspices of the U.S. Department of Energy by LANL under contract DE-AC52-06NA25396.

Jonathan Hager
Los Alamos National Laboratory

Date submitted: 09 Jul 2014

Electronic form version 1.4