Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Observation of Recurring Phase-Inversions in Radiatively Heated Single-Mode Sinusoidal Perturbations N.E. LANIER, J. WORKMAN, S.D. CROCKETT, R.L. HOLMES, R.N. MULFORD, B. PATTERSON, D. SCHMIDT, D. SWIFT, Los Alamos National Laboratory, P. GRAHAM, A. MOORE, Atomic Weapons Establishment — Experiments studying the hydrodynamic evolution of radiatively heated single-mode perturbations have been conducted at the OMEGA laser facility. An epoxy layer with a sinusoidal interface is embedded in foam and heated with tin *L*-shell radiation. As the epoxy expands, an optional shock, with independently controlled strength and timing, is introduced. The resulting hydrodynamic behavior is radiographically. Experimental data along with three-dimensional RAGE simulations are used to generate a more complete picture of this preheat-induced evolution. When preheated, the initial expansion of the sinusoidal perturbation forms a complex set of shocks and an interface that quickly becomes nonlinear. The interaction of these preheat-induced shocks result in density gradients, whose phase, with respect to the initial perturbation, oscillates in time. In this experiment, when the shock propagates through the evolving layer, these density gradients are the dominant influence on post-shock hydrodynamic behavior. This work is sponsored by U. S. DOE under Contract No. DE-AC52-06NA25396.

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Date submitted: 17 Sep 2007 Electronic form version 1.4