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Coupled Hydrodynamic Instability Growth on Oblique Interfaces with a Reflected Rarefaction A.M. RASMUS, Los Alamos National Laboratory/University of Michigan, K.A. FLIPPO, C.A. DI STEFANO, F.W. DOSS, Los Alamos National Laboratory, J.D. HAGER, Lockheed-Martin, E.C. MERRITT, T. CARDENAS, D.W. SCHMIDT, J.L. KLINE, Los Alamos National Laboratory, C.C. KURANZ, University of Michigan — Hydrodynamic instabilities play an important role in the evolution of inertial confinement fusion and astrophysical phenomena. Three of the Omega-EP long pulse beams (10 ns square pulse, ∼14 kJ total energy, 1.1 mm spot size) drive a supported shock across a heavy-to-light, oblique, interface. Single- and double-mode initial conditions seed coupled Richtmyer-Meshkov (RM), Rayleigh-Taylor (RT), and Kelvin-Helmholtz (KH) growth. At early times, growth is dominated by RM and KH, whereas at late times a rarefaction from laser turn-off reaches the interface, leading to decompression and RT growth. The addition of a thirty degree tilt does not alter mix width to within experimental error bars, even while significantly altering spike and bubble morphology. The results of single and double-mode experiments along with simulations using the multi-physics hydro-code RAGE will be presented. This work performed under the auspices of the U.S. Department of Energy by LANL under contract DE-AC52-06NA25396. This work is funded by the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0002956. This material is partially supported by DOE Office of Science Graduate Student Research (SCGSR) program.

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