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Results of a supersonic, single-mode, shockwave-driven Kelvin-Helmholtz instability experiment W.C. WAN, University of Michigan, USA, G. MALAMUD, Nuclear Research Center, Israel, C.A. DI STEFANO, M.R. TRANTHAM, S.R. KLEIN, University of Michigan, USA, A. SHIMONY, D. SHVARTS, Nuclear Research Center, Israel, C.C. KURANZ, R.P. DRAKE, University of Michigan, USA — The Kelvin-Helmholtz instability is a hydrodynamic process that causes mixing at an interface with shear flow. It is prevalent in many high-energy-density systems such as fusion research, core-collapse supernovae, and protoplanetary disks. Although it is common to simplify the Euler equations by assuming incompressibility, this assumption does not account for the inhibited growth rate found in supersonic flows. Here, we present the first laboratory observations of single-mode, compressible Kelvin-Helmholtz instability growth. This experiment was performed at the OMEGA-EP facility using three beams stitched into a 28 ns square pulse to sustain a shockwave in low-density foam. The shockwave generated shear along the interface between the foam and a high-density plastic, seeded with a precisely machined single-mode sinusoidal perturbation. The system was diagnosed using radiography with a spherically bent crystal. This work is funded by the U.S. Department of Energy, through the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0001840, the National Laser User Facility Program, grant number DE-NA0000850, and the Laboratory for Laser Energetics, University of Rochester by the NNSA/OICF under Cooperative Agreement No. DE-FC52-08NA28302

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