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Investigating shock-driven Richtmyer-Meshkov Rayleigh-Taylor ripple evolution before and after re-shock[1] SABRINA R. NAGEL, CHANNING M. HUNTINGTON, TED BAUMANN, JASON D. BENDER, STEPHAN A. MACLAREN, KUMAR S. RAMAN, PING WANG, YE K. ZHOU, Lawrence Livermore National Laboratory — Late-time Rayleigh-Taylor(RT)/Richtmyer-Meshkov(RM) instabilities in a planar geometry at high-energy-densities are investigated using a shock-tube containing a pre-machined interface between dense and light materials. The platform uses the NIF laser to indirectly drive a strong shock which turns the initially solid target into a plasma and the material boundary into a fluid interface with the imprinted initial condition. The interface evolves by action of the RT and RM instabilities, and the growth is imaged with backlit x-ray radiography. We present data from experiments using sinusoidal interface perturbations driven from the heavy to the light side. Late-time radiographic images show the initial conditions reaching the deeply nonlinear regime, and an evolution of fine structure consistent with a transition to turbulence. The evolution after re-shock, including a possible loss of initial conditions, and comparisons with post-shot numerical simulations are also discussed.

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Sabrina Nagel
Lawrence Livermore National Laboratory

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