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Experimental platform for shock-driven Rayleigh-Taylor / Richtmyer-Meshkov evolution before and after re-shock[1] CHANNING HUNTINGTON, SABRINA NAGEL, JASON BENDER, KUMAR RAMAN, TED BAUMANN, STEPHAN MACLAREN, SHON PRISBREY, YE ZHOU, Lawrence Livermore National Lab — The growth of Richmyer-Meshkov and Rayleigh-Taylor instabilities at an interface that is impulsively accelerated, for example by the passage of a shock, have been studied in many laser-driven experiments. However, investigation of instability growth subject to a second shock ("reshock") has to date been limited to "classical" (non-high-energy-density) shock tubes. Here we describe the results of experiments, performed on the National Ignition Facility, to directly measure the growth *vs.* time of the non-linear instability at a planar interface before and after reshock. In this work the unstable mixing region is directly imaged with side-on x-ray radiography, and we highlight the unique advantages of laser-driven experiments over classical shock tubes. These include precise control over the initial conditions of the instability, as well as tailored x-ray opacity to ensure accurate measurement of the entire region of material interpenetration.

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