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Experimental observation of Rayleigh-Taylor growth as a function of wavelength in the warm dense matter regime[1] C.M. HUNTINGTON, A. ARSENLIS, B.R. MADDOX, H.-S. PARK, S.T. PRISBREY, S.V. WEBER, C.E. WEHRENBERG, B.A. REMINGTON, Lawrence Livermore Natl Lab — "Classical" Rayleigh-Taylor (RT) growth is characterized by a growth rate $\gamma = \sqrt{kgA_n}$, where k is the wavelength of the unstable mode, g is the acceleration, and the Atwood A_n number characterizes the magnitude of the density jump at the interface. Here we present the results of a set of experiments using face-on x-ray radiography to measure RT growth in a plastic rippled sample. Acceleration of the sample is provided by the stagnation of a releasing shocked plastic "reservoir," which is directly driven by approximately 1 kJ of laser energy at the OMEGA facility. The growth of pre-imposed ripples is recorded using transmission x-ray radiography of a vanadium He_α source, where the opacity of the sample is calibrated to the ripple amplitude. We report the results of experiments at 30 μm and 60 μm initial wavelengths, and compare the data to 2D hydrodynamic simulations.

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Channing Huntington
Lawrence Livermore Natl Lab

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