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Rayleigh Taylor Growth At An Embedded Interface Driven By A Radiative Shock[1] C.M. HUNTINGTON, H.-S. PARK, K.S. RAMAN, A.R. MILES, S.A. MACLAREN, D.H. KALANTAR, H.F. ROBEY, B.A. REMINGTON, Lawrence Livermore National Laboratory, F.W. DOSS, J.L. KLINE, K.A. FLIPPO, Los Alamos National Laboratory, C.C. KURANZ, W. WAN, R.P. DRAKE, University of Michigan — Radiative shocks are those where the radiation generated by the shock influences the hydrodynamics of the matter in the system. Radiative shocks occur during supernovae, as well as during the rebound phase of inertial confinement fusion (ICF) capsules. In the presence of a radiative shock, Rayleigh-Taylor (RT) growth at an unstable interface may be reduced relative to the growth from a purely hydrodynamic system. Using a 325 eV hohlraum on the National Ignition Facility (NIF), we are able to, for the first time, generate a radiative shock that traverses an RT-unstable interface. Because the generation of radiation at the shock front is a strong function of shock velocity ($\propto v^8$), the RT growth in the presence of fast and slow shocks were directly compared. We observe reduced RT spike development when the driving shock is expected to be radiative. The amplitude of the unstable embedded feature was in good agreement with 2D models for both the low-drive (225 eV) and high drive (325 eV) cases. This result has important implications for our understanding of astrophysical radiative shocks, as well as the dynamics of ICF capsules.

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