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Simulations of Rayleigh Taylor Instabilities in the presence of a Strong Radiative shock[1] MATTHEW TRANTHAM, CAROLYN KURANZ, DOV SHVARTS, R. P. DRAKE, University of Michigan — Recent Supernova Rayleigh Taylor experiments on the National Ignition Facility (NIF) are relevant to the evolution of core-collapse supernovae in which red supergiant stars explode. Here we report simulations of these experiments using the CRASH code. The CRASH code, developed at the University of Michigan to design and analyze high-energy-density experiments, is an Eulerian code with block-adaptive mesh refinement, multi-group diffusive radiation transport, and electron heat conduction. We explore two cases, one in which the shock is strongly radiative, and another with negligible radiation. The experiments in all cases produced structures at embedded interfaces by the Rayleigh Taylor instability. The weaker shocked environment is cooler and the instability grows classically. The strongly radiative shock produces a warm environment near the instability, ablates the interface, and alters the growth. We compare the simulated results with the experimental data and attempt to explain the differences.

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