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The Role of Radiation in Shock-Driven Shear Instabilities[1]
SONYA DICK, GRIFFIN CEARLEY, MATTHEW TRANTHAM, CAROLYN KURANZ, ERIC JOHNSEN, University of Michigan - Ann Arbor — Although the hydrodynamics of interfacial instabilities has been the object of numerous studies in high-energy-density physics, the role of radiation on perturbation growth is poorly understood. We present a computational study of the role of radiation on shock-driven shear instabilities. Using CRASH, a block-adaptive Eulerian radiation-hydrodynamics code with flux-limited multigroup diffusion, we conduct two-dimensional simulations based on the shock-shear experiments of [1]. We consider two different laser drive profiles to isolate the effect of radiation on the growth of the mixing layer. The low-drive case gives rise to primarily hydrodynamic growth. In the high-drive case, the radiative precursor preheats the upstream material before the arrival of the shock, thus slowing the mixing layer growth. [1] K. A. Flippo, et al., Phys. Plasmas 25, 056315 (2018).

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