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Simulation and Analysis of Mixing Layer Evolution in Multi-Mode, Laser-Driven Rayleigh-Taylor Experiments[1] NATHAN HEARN, ASC Flash Center, University of Chicago, Chicago, Illinois, TOMASZ PLEWA, School of Computational Science, Florida State University, Tallahassee, Florida, R. PAUL DRAKE, Space Physics Research Laboratory, University of Michigan, Ann Arbor, Michigan, CAROLYN KURANZ — Recent experiments at the Omega laser facility have produced data of sufficient quality to investigate structural details of single- and multi-mode Rayleigh-Taylor instability growth. The FLASH hydrodynamics code has been used to model these experiments in two and three dimensions. We present a comparison between the experimental data and raytraced images of the three-dimensional simulations, and we also explore the effects of choosing different adiabatic indexes for our ideal-gas realizations of the two fluids. Finally, we contrast the simulated evolution of single- and double-mode perturbations in terms of their mixing layer growth and mass distributions. In accordance with theoretical expectations, we find that short-wavelength modes show the fastest initial growth, and that the structure of the mixing layer is eventually dominated by the longer modes.

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