Radiation Hydrodynamics Simulations of Radiative Shear Experiments at the National Ignition Facility

XIYA WEI, MATTHEW TRANTHAM, University of Michigan, KIRK ADLER FLIPPO, CARLOS DI STEFANO, Los Alamos National Laboratory, ERIC JOHNSEN, CAROLYN KURANZ, University of Michigan — The Shock/Shear platform was developed at LANL to study turbulent mixing in high-energy-density systems. By using a radiative shock, we seek to develop a similar experiment, which explores effects of a radiation on the developing structure of the experiment. The shock tube containing a solid plastic ablator and various types of foam is irradiated by halfraum that will drive either a radiative shock or adiabatic shock into the foam material. The radiation hydrodynamic code, Hyades, was used to scope the experiment. We show the results of a parameter study to determine an optimal experiment design by varying the foam material (CRF and SiO2), the foam density, and ablator thickness. Our simulations provide plasma parameters under which a successful experiment is possible.

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