

Abstract Submitted
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Simultaneous PIV/PLIF measurements of Richtmyer-Meshkov Instabilities from single- and multi-mode perturbed interfaces RICARDO MEJIA-ALVAREZ, BRANDON WILSON, KATHY PRESTRIDGE, Los Alamos National Laboratory, EXTREME FLUIDS TEAM — To support validation of RANS and LES codes for single-interface Richtmyer-Meshkov mixing, the Extreme Fluids Team at Los Alamos National Laboratory commissioned a Vertical Shock Tube. This facility has the capability of generating statistically stationary single- and multi-mode spatial perturbations on the fluid interface prior to shock-interface interaction. The present study focuses on comparing the evolution of shock-driven mixing under two different spatial perturbation conditions after interacting with a $M=1.2$ shock wave. High resolution simultaneous PIV and PLIF are used for capturing 2D instantaneous realizations of velocity and density at different stages of the evolving interface. Multiple realizations of the flow at each one of these evolution stages are obtained to characterize the flow statistically. Also, a modal analysis via Singular Value Decomposition is performed on the density and velocity fields to elucidate the role of initial flow scales content on the transition to turbulent mixing.

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