

Abstract Submitted
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High resolution experimental measurements of Richtmyer-Meshkov turbulence in fluid layers after reshock KATHERINE PRESTRIDGE, B.J. BALAKUMAR, GREGORY ORLICZ, CHRIS TOMKINS, LANL — We present true ensemble-averaged turbulence measurements of density, velocity and density-velocity cross-statistics in a reshocked Richtmyer-Meshkov unstable layer. The experiment is a layer of SF₆ embedded in air that is accelerated by a Mach 1.2 shock in a gas shock tube and then reshocked with the reflected shock. Reshock of the gas curtain drives transition to turbulence. We capture instantaneous density and velocity fields simultaneously in two dimensions using Particle Image Velocimetry (PIV) and Planar Laser-Induced Fluorescence (PLIF). Ensembles of density and velocity fields are collected through repetition of the experiment and close monitoring to ensure identical initial conditions between experiments. Initial conditions of the curtain are perturbed using fixed sinuous and/or varicose nozzles, and the impact of initial condition modes on the resulting turbulence statistics is studied. Data and error analysis, as well as correlation methods, will be presented.

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