

Abstract Submitted  
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**Initial conditions effects in shock-driven instabilities** SRIDHAR BALASUBRAMANIAN, B.J. BALAKUMAR, GREG ORLICZ, CHRIS TOMKINS, KATHY PRESTRIDGE, LANL — Recent work at LANL (Dimonte et al, Phys Fluids 2004, Ramaprabhu et al, JFM 2005) has shown that buoyancy-driven turbulence can be affected at late-time by initial conditions, and memory of the initial conditions is not lost. We study the initial condition parameters that impact the mixing and transition to turbulence in shock-driven, Richtmyer-Meshkov unstable flows. A detailed study of the impact of wavelength and amplitude of initial condition perturbations in a heavy gas curtain (air-SF6-air) is undertaken. Carefully controlled, membrane-free initial conditions with  $At=0.67$  and shock Mach number of 1.2 are used to examine the effect of varying the initial modes of the gas curtain. The temporal and spatial evolution of the flow is measured using simultaneous Particle Image Velocimetry (PIV) and Planar-Laser Induced Fluorescence (PLIF). This work is supported by the Los Alamos Laboratory Directed Research and Development Program.

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