

Abstract Submitted  
for the DFD13 Meeting of  
The American Physical Society

**Dependence of Single-Interface Richtmyer-Meshkov Mixing on Mach Number using Simultaneous PIV and PLIF Measurements** BRANDON M. WILSON, RICARDO MEJIA-ALVAREZ, KATHY P. PRESTRIDGE, Los Alamos National Laboratory — Richtmyer-Meshkov mixing is dependent upon initial interface perturbations, incident shock Mach number, Atwood number, and other fluid properties. The correlation between turbulence quantities and mixing parameters with these properties is not well-understood. The Vertical Shock Tube (VST) at Los Alamos National Lab is designed to measure turbulence and mixing from the Taylor micro-scale to the largest scales (mix width). We use simultaneous velocity (PIV) and density (PLIF) diagnostics to understand the effects of incident Mach number on statistically-invariant, multimode perturbations of an air-SF<sub>6</sub> interface (Atwood number corrected for acetone diagnostic is  $A = 0.57$ ). We quantify Ma effects on mixing at both large and small scales by measuring the time evolution of various mixing parameters (*e.g.* mixing width, Favre-averaged Reynolds stresses, and vorticity), and we compare these results to previous studies. Late mixing after the first shock resembles a turbulent flow, and we examine the nature of the turbulence and condition of turbulent transition.

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Date submitted: 30 Jul 2013

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