

Abstract Submitted  
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**Mach number effects on velocity and density measurements in Richtmyer-Meshkov mixing** BRANDON WILSON, RICARDO MEJIA-ALVAREZ, KATHY PRESTRIDGE, Los Alamos Natl Lab, LIUYANG DING, Arizona State University, Laboratory for Energetic Flow and Turbulence (LEFT) — Richtmyer-Meshkov (RM) mixing is sensitive to many parameters: incident Mach number, Atwood number, and initial interface perturbations. The correlation between turbulence and mixing quantities and these parameters is not well-understood. The Vertical Shock Tube (VST) at Los Alamos National Lab is designed to measure the spectrum of scales existing in RM mixing growth and transition to turbulence. We use density (PLIF) and velocity (PIV) diagnostics to understand the effects of Mach number on an air-SF<sub>6</sub> interface with multimode perturbations. We quantify Ma effects on the evolution of RM growth at large scales. We then statistically characterize the effect of shock strength on small scale turbulence and mixing (*e.g.* Favre-averaged Reynolds stresses, instantaneous dissipation rate, and vorticity) at specific times after first shock. First shock mixing appears to transition to turbulence, and we examine the conditions of this transition. We also use first measurements of tomographic PIV in the vertical shock tube to investigate RM mixing anisotropy.

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