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Richtmyer-Meshkov Instability in Thin Fluid Layers: Turbulent Mixing, Mach Number and Reshock Effects GREGORY ORLICZ, B.J. BALAKUMAR, DEVESH RANJAN, CHRISTOPHER TOMKINS, KATHY PRESTRIDGE, Los Alamos National Laboratory — A thin air-SF6-air gas curtain is impulsively accelerated by planar shock waves of varying strength (Mach 1.2-1.5) and investigated experimentally using simultaneous concentration field visualization and particle image velocimetry measurements. A novel nozzle design is used to create highly repeatable and flexible initial conditions that allow for isolation of effects on the flow structure due to Mach number and initial modal composition. The effective position of the end wall is also varied to re-shock the evolving structure, accelerating the transition of the flow to a turbulent regime. Turbulence statistics are compared between a single mode varicose curtain, and a multi-mode curtain. These true-ensemble averaged statistics are the first such measurements in variable density turbulent flows in thin fluid layers, and can be used for code validation.

Gregory Orlicz
Los Alamos National Laboratory

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