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Shock-Driven Mixing: Experimental Design and Initial Conditions GAVIN FRIEDMAN, KATHY PRESTRIDGE, RICARDO MEJIA-ALVAREZ, MEGAN LEFTWICH — A new Vertical Shock Tube (VST) has been designed to study shock-induced mixing due to the Richtmyer-Meshkov Instability (RMI) developing on a 3-D multi-mode interface between two gases. These studies characterize how interface contours, gas density difference, and Mach No. affect the ensuing mixing by using simultaneous measurements of velocity/density fields. The VST allows for the formation of a single stably-stratified interface, removing complexities of the dual interface used in prior RMI work. The VST also features a new diaphragmless driver, making feasible larger ensembles of data by reducing intra-shot time, and a larger viewing window allowing new observations of late-time mixing. The initial condition (IC) is formed by a co-flow system, chosen to minimize diffusion at the gas interface. To ensure statistically stationary ICs, a contoured nozzle has been manufactured to form repeatable co-flowing jets that are manipulated by a flapping splitter plate to generate perturbations that span the VST. This talk focuses on the design of the IC flow system and shows initial results characterizing the interface.

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