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High-resolution, time-resolved PIV measurements on the Richtmyer-Meshkov instability in a dual-driver vertical shock tube. KEVIN FERGUSON, EVEREST SEWELL, JEFFREY JACOBS, The University of Arizona — Experiments on the Richtmyer-Meshkov Instability (RMI) using Particle Image Velocimetry (PIV) in a dual driver vertical shock tube are presented. Two shock waves generated at opposite ends of a vertical shock tube travel in opposing directions, impacting a perturbed interface formed between Air and Sulfur Hexaflouride (SF_6). Perturbations are formed using a pair of voice coil driven pistons that generate Faraday waves on the interface. The incident shock wave arrives from the air side of the interface which initiates the RMI. Shortly afterward a second shock wave arrives from the SF_6 side which generates reshock. Shock strengths are chosen to result in halted interface motion after passage of the second shock wave, permitting a long observational window in which the instability can evolve and yielding a simplified optical and recording setup as compared to typical single-driver experiments. Four cameras are utilized in a tiled pattern to create a high-speed recording of each experiment with a greatly increased final vector resolution compared to previous experiments. Information on the growth of the RMI, including measurements of the growth exponent, θ, anisotropy, and turbulent kinetic energy decay are presented.

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