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Experimental Investigation of Velocity Evolution in the Richtmyer-Meshkov Instability DANIEL REESE, JASON OAKLEY, DAVE ROTHAMER, RICCARDO BONAZZA, University of Wisconsin — The present work describes the evolution of the Richtmyer-Meshkov instability through a focus on the development of velocity fluctuations. In the Wisconsin Shock Tube Laboratory at the University of Wisconsin, a broadband, shear-layer initial condition is created at the interface between helium and argon. This shear layer is seeded with particulate TiO_2 , which is used to track the flow and allow for the Mie scattering of light. Once impulsively accelerated by a $M=1.4$ shock wave, the interface is imaged twice in close succession using planar laser imaging to create particle image pairs. Velocity fields are obtained from these particle images using the Insight 4G software package from TSI. This process is repeated, capturing a total of four different times in the development of the instability, allowing for the study of velocity development in the RMI. For each post-shock time, velocity field structure is investigated, and probability density functions of velocity fluctuations are compared. Using known length scales from previous studies, these newfound RMS velocity values are also used to give an estimate of the Reynolds number.

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