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Experiments and simulations of Richtmyer-Meshkov Instability with measured, volumetric initial conditions. EVEREST SEWELL, KEVIN FERGUSON, JEFFREY JACOBS, The University of Arizona, JEFF GREENOUGH, Lawrence Livermore National Laboratory, VITALIY KRIVETS, The University of Arizona — We describe experiments of single-shock Richtmyer-Meshkov Instability (RMI) performed on the shock tube apparatus at the University of Arizona in which the initial conditions are volumetrically imaged prior to shock wave arrival. Initial perturbations play a major role in the evolution of RMI, and previous experimental efforts only capture a single plane of the initial condition. The method presented uses a rastered laser sheet to capture additional images throughout the depth of the initial condition immediately before the shock arrival time. These images are then used to reconstruct a volumetric approximation of the experimental perturbation. Analysis of the initial perturbations is performed, and then used as initial conditions in simulations using the hydrodynamics code ARES, developed at Lawrence Livermore National Laboratory (LLNL). Experiments are presented and comparisons are made with simulation results.

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