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On reliable quantification of Richtmyer-Meshkov flows[1] NORA SWISHER, Carnegie Mellon University, MILOS STANIC, Technical University of Munich, ROBERT STELLINGWERF, Stellingwerf Consulting, JASON OAKLEY, RICCARDO BONAZZA, University of Wisconsin-Madison, SNEZHANA ABARZHI, Carnegie Mellon University — We report an integrated study including experiments, Smooth Particle Hydrodynamics simulations, and theoretical and data analyses to reliably quantify Richtmyer-Meshkov (RM) flows induced by moderate shocks. The RM evolution is analyzed for realistic gases with different densities (Atwood numbers 0.68, 0.95) driven by moderate shocks (Mach 2.86, 1.95) in case of relatively small amplitude of the initial perturbation (0.06, 0.08 of the perturbation wavelength). Our study includes the systematic consideration of the effects of gamma, the initial perturbation amplitude, and the interference of the perturbation waves. We analyze quantitative and qualitative features of RM dynamics, including the vector and scalar flow fields, the bulk and interface velocities, the large-scale interfacial structures and small-scale non-uniformities (reverse jets, hot spots) in the bulk. We argue that a systematic interpretation of RM dynamics from the data and a reliably quantification the RM evolution requires a synergy of the experiments, simulation, and theory.

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