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Comparison of the Effects of Mach Number on the Spatiotemporal Evolution of Turbulence and Mixing in Reshocked Richtmyer-Meshkov Instability[1] TIBERIUS MORAN-LOPEZ, National Nuclear Security Administration, OLEG SCHILLING, Lawrence Livermore National Laboratory —
The predictions of a multicomponent $K\epsilon$ Reynolds-averaged Navier-Stokes model applied to reshocked Richtmyer-Meshkov instability experiments with progressively larger incident shock Mach numbers are compared in detail. The model includes molecular dissipation and diffusion, mean and turbulent enthalpy diffusion, and closure models for pressure-dilatation and dilatation dissipation. This model was previously shown to give mixing layer widths in very good agreement with experimental data for a wide range of cases, including the Vetter-Sturtevant, Poggi et al., Leinov et al., and Houas-Chemouni experiments with Mach numbers ranging from 1.20 to 4.20. The spatiotemporal evolution of various statistics, fields, and transport equation budgets are compared among the cases considered here to quantify the effects of increasing Mach number on the intensity of turbulence and mixing both before and after reshock.

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