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**Hybrid WENO/Central Difference Navier-Stokes Simulation of Reshocked Richtmyer-Meshkov Instability**[1] OLEG SCHILLING, Lawrence Livermore National Laboratory, WAI SUN DON, Brown University — A new hybrid WENO/central finite-difference method has been developed for the high-resolution, multi-dimensional, efficient simulation of turbulent mixing induced by interfacial hydrodynamic instabilities. Multi-resolution analysis is used to dynamically determine regions in which large gradients or discontinuities exist (where upwinding is applied) and regions in which the flow is smooth (where central differencing is applied). This method is used to solve the dissipative fluid dynamics equations describing reshocked Richtmyer–Meshkov unstable flow in the Mach 1.3 Jacobs–Krivets and Mach 1.5 Vetter–Sturtevant shock tube experiments. The mixing layer widths are shown to be in good agreement with experimental data on the growth of the layer. Additional quantities not measured in the experiment, such as local and global molecular mixing parameters, energy spectra, and statistics are also calculated and compared (when possible) to previously obtained results using monotone-integrated large- eddy simulation and implicit large-eddy simulation methods.

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