Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Comparative Study of the Predictions of Four-Equation Reynolds-Averaged Navier-Stokes Models Applied to Richtmyer-Meshkov Instability-Induced Mixing[1] OLEG SCHILLING, Lawrence Livermore National Laboratory — A multicomponent, weighted essentially nonoscillatory implementation of several four-equation K-ϵ and K-L based Reynolds-averaged Navier–Stokes models is used to simulate reshocked Richtmyer–Meshkov turbulent mixing at various Mach and Atwood numbers. One class of models is based on mechanical turbulence coupled to scalar variance and its dissipation rate, and the other is based on mechanical turbulence coupled to mass flux and the density–specific volume correlation. The predicted evolution of the mixing layer, molecular mixing and other quantities obtained from these models are systematically intercompared, as well as compared to experimental shock tube data. The relative advantages and disadvantages of the various models are discussed.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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Date submitted: 03 Aug 2012 Electronic form version 1.4