Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Turbulence characteristics of the mixing region in the planar Richtmyer-Meshkov Instability POOYA MOVAHED, SREENIVAS VARADAN, ERIC JOHNSEN, University of Michigan, Ann Arbor — The development of the turbulent mixing region at late times in the Richtmyer-Meshkov instability plays an important role in high energy density phenomena, specifically in Inertial Confinement Fusion and supernova explosion. A numerical investigation of the turbulence characteristics of the single-mode Mach 1.21 air(acetone)/SF6 shock tube experiment of Collins and Jacobs [JFM 2002] with reshock is performed using a second-order MUSCL-Hancock and several high-order WENO schemes. The effects of the grid-dependent numerical dissipation on small-scale features and efficiency of the methods are discussed for the multi-component Euler equations by considering the turbulent kinetic energy, turbulent Mach number, and enstrophy. Resolved simulations of the Navier-Stokes equations are performed at practical Reynolds numbers to evaluate the role of physical diffusion. A similar analysis of the Rayleigh-Taylor instability will be discussed. This research was supported in part by the DOE NNSA under the Predictive Science Academic Alliance Program by grant DEFC52-08NA28616.

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Date submitted: 13 Jul 2011 Electronic form version 1.4