Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Quantitative analysis of three-dimensional reshocked Richtmyer-Meshkov instability-induced mixing using different orders of WENO flux reconstruction MARCO LATINI, California Institute of Technology, OLEG SCHILLING, University of California, Lawrence Livermore National Laboratory, WAI-SUN DON, Brown University — The formally high-order, Eulerian, shock-capturing weighted essentially non-oscillatory (WENO) method is applied to a three-dimensional model of the Mach 1.5 air/SF_6 Vetter-Sturtevant shock tube experiment with reshock. Results from fifth-, ninth- , and eleventh-order simulations are compared to quantitatively investigate the dependence of the dynamics and flow structure (including time-evolution of the mixing layer width, global and local mixing statistics, and spectra) on the order of flux reconstruction. Some of the benefits of high-order methods are discussed, including implications for assessing turbulent transport and mixing models for complex hydrodynamic flows. This work was performed under the auspices of the U.S. Department of Energy by the University of California Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48. This work was also supported by the Caltech ASC-Alliance Program. UCRL-ABS-214353.

Oleg Schilling
Lawrence Livermore National Laboratory

Date submitted: 12 Aug 2005 Electronic form version 1.4