Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Numerical Study of Richtmyer-Meshkov Instability with Re-Shock[1] MAN LONG WONG, Stanford University, DANIEL LIVESCU, Los Alamos National Laboratory, SANJIVA LELE, Stanford University — The interaction of a Mach 1.45 shock wave with a perturbed planar interface between two gases with an Atwood number 0.68 is studied through 2D and 3D shock-capturing adaptive mesh refinement (AMR) simulations with physical diffusive and viscous terms. The simulations have initial conditions similar to those in the actual experiment conducted by Poggi et al. [1998]. The development of the flow and evolution of mixing due to the interactions with the first shock and the re-shock are studied together with the sensitivity of various global parameters to the properties of the initial perturbation. Grid resolutions needed for fully resolved and 2D and 3D simulations are also evaluated. Simulations are conducted with an in-house AMR solver HAMeRS built on the SAMRAI library. The code utilizes the high-order localized dissipation weighted compact nonlinear scheme [Wong and Lele, 2017] for shock-capturing and different sensors including the wavelet sensor [Wong and Lele, 2016] to identify regions for grid refinement.

[1]First and third authors acknowledge the project sponsor LANL.

Man Long Wong
Stanford University

Date submitted: 31 Jul 2017 Electronic form version 1.4