Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Exploring Model Assumptions Through Three Dimensional Mixing Simulations Using a High-order Hydro Option in the Ares Code[1]
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This work presents results from a large eddy simulation of a high Reynolds number Rayleigh-Taylor instability and Richtmyer-Meshkov instability. A tenth-order compact differencing scheme on a fixed Eulerian mesh is utilized within the Ares code developed at Lawrence Livermore National Laboratory. (LLNL) We explore the self-similar limit of the mixing layer growth in order to evaluate the k-L-a Reynolds Averaged Navier Stokes (RANS) model (Morgan and Wickett, Phys. Rev. E, 2015). Furthermore, profiles of turbulent kinetic energy, turbulent length scale, mass flux velocity, and density-specific-volume correlation are extracted in order to aid the creation a high fidelity LES data set for RANS modeling.

[1]Prepared by LLNL under Contract DE-AC52-07NA27344.

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Date submitted: 30 Jul 2015 Electronic form version 1.4