

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Sorting Category: 24. (C)

On Implicit LES for Predictive Material Turbulent Mixing FERNANDO GRINSTEIN, BOB GREENE, ADAM WACHTOR, Los Alamos National Laboratory — Implicit LES relies on the use of subgrid modeling and filtering provided implicitly by *physics capturing* numerics. For regimes driven by large scale flow features – which LES is designed to model, implicit models associated with such methods have been shown to be capable by themselves to emulate subgrid physics effects on statistics of turbulent velocity fluctuations. A major research focus is on evaluating the extent to which subgrid physical material mixing effects can be implicitly modeled, recognizing when additional material treatments are needed, and developing a sound conceptual framework for designing effective strategies using *mixed* explicit-implicit subgrid modeling contributions acting in effective *collaborative* (rather than competitive) fashion. We report our progress on ILES studies of non-stationary turbulent mixing. Studies of non-passive mixing driven by Richtmyer-Meshkov instabilities (RMI) are examined. The RMI adds the complexity of shock waves and other compressible effects to the basic physics associated with mixing. The unique combination of shock and turbulence emulation capabilities supports direct use of ILES as an effective simulation *ansatz* in RMI mixing research. This possibility is demonstrated in the current paper in the context of prototypical case studies for which available laboratory and/or previous LES data can be used to test and validate ILES.

☒ Prefer Oral Session
☐ Prefer Poster Session

Fernando Grinstein
fgrinstein@lanl.gov
Los Alamos National Laboratory

Date submitted: 05 Aug 2008

Electronic form version 1.4