Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Modeling of the subgrid scale viscous/scalar dissipation in compressible turbulence NAVID S. VAGHEFI, SUNY at Buffalo, MEHDI B. NIK, PATRICK PISCIUNERI, PEYMAN GIVI, University of Pittsburgh, CYRUS K. MADNIA, SUNY at Buffalo — Results are presented of subgrid scale (SGS) viscous/scalar dissipation models using *a priori* analysis of compressible turbulent flows. This is done via assessment of DNS of several turbulent flow configurations at varying compressibility levels, Reynolds and Schmidt numbers. These models will be used as sub-closures in the LES via FDF of compressible turbulence. Optimum model parameters are calculated by maximizing the correlation coefficients between the SGS exact and modeled terms, and optimal estimators are used to verify the results. The effects of the filter width are also assessed for sub-closures. Different methods for calculating the model coefficients are evaluated and it is shown that a dynamic procedure based on the global SGS equilibrium between the production and dissipation produces the best results.

Navid S. Vaghefi
SUNY at Buffalo

Date submitted: 03 Aug 2012 Electronic form version 1.4