Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Application of a New Hybrid RANS/LES Modeling Paradigm to Compressible Flow TODD OLIVER, CLARK PEDERSON, SIGFRIED HAERING, ROBERT MOSER, Univ of Texas, Austin — It is well-known that traditional hybrid RANS/LES modeling approaches suffer from a number of deficiencies. These deficiencies often stem from overly simplistic blending strategies based on scalar measures of turbulence length scale and grid resolution and from use of isotropic subgrid models in LES regions. A recently developed hybrid modeling approach has shown promise in overcoming these deficiencies in incompressible flows [Haering, 2015]. In the approach, RANS/LES blending is accomplished using a hybridization parameter that is governed by an additional model transport equation and is driven to achieve equilibrium between the resolved and unresolved turbulence for the given grid. Further, the model uses an tensor eddy viscosity that is formulated to represent the effects of anisotropic grid resolution on subgrid quantities. In this work, this modeling approach is extended to compressible flows and implemented in the compressible flow solver SU2 (http://su2.stanford.edu/). We discuss both modeling and implementation challenges and show preliminary results for compressible flow test cases with smooth wall separation.

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Date submitted: 01 Aug 2017 Electronic form version 1.4