Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

An improved numerical scheme for a dynamic LES model BRANISLAV BASARA, AVL List GmbH — Dynamic LES models are very popular nowadays. There are clear advantages in computing rather than prescribing the unknown coefficient that appear in a subgrid-scale model for Large Eddy Simulation (LES). Whatever is the origin of the model; these dynamic models usually impair the convergence rate when compared to the standard and well-known Smagorinski model. Although most of them provide physical bounds for the non-dimensional constant and with that numerically reasonable values for the unknown sub grid-scale stresses, strong gradients of these terms that can appear across the flow may introduce additional difficulties to the numerical simulations. In the present discretization scheme, we use a deferred-correction approach for the subgrid-scale stresses with the additional correction term, which all together ensure a more stable solution, but without negative effects on the accuracy. As a representative dynamic LES model, we choose the coherent structure model of Kobayashi (2005). Nevertheless, the conclusions derived here are applicable to other dynamic models as well.

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Date submitted: 31 Jul 2015 Electronic form version 1.4