Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Extending the dynamic slip-wall model to a compressible discontinuous-Galerkin method CORENTIN CARTON DE WIART, SCOTT MURMAN, NASA Ames Research Center — Standard equilibrium wall models suffer from both a strong dependence upon mesh resolution and the equilibrium turbulence assumption. Non-equilibrium wall models similarly have limitations for complex geometry due to the need for an auxiliary semi-structured mesh solver, and coupling between the LES and wall-model regions. Bose and Moin's dynamic slip-wall model[1] offers a new modeling paradigm that does not rely upon assumptions about the local flow physics and uses a dynamic procedure so that the results are independent of resolution. Despite this, the model has not gained significant traction and few independent implementations have been tested. The current work implements the dynamic slip-wall model in an entropy-stable Discontinuous-Galerkin spectral-element solver with a dynamic variational multiscale sub-grid model[2]. This involves both extending the model to a compressible formulation and to a different numerical method. The compressible model is outlined and tested on both attached and separated flows of aerodynamic interest.

[1]Bose and Moin, Phys. Fluids **26**(1), (2014)
[2]Murman *et al.*, AIAA 2016-1059

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Date submitted: 21 Jul 2016 Electronic form version 1.4