

Abstract Submitted  
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**Assessment of Shock-Capturing Schemes and Subgrid-Scale Models for Large-Eddy Simulation of Highly Compressible Turbulence**

NATHAN GRUBE, PINO MARTIN, Princeton University — We assess recent weighted essentially non-oscillatory (WENO) schemes with lower dissipation for large-eddy simulations (LES) of highly compressible forced isotropic turbulence. In particular, we test both linearly [1] and linearly-nonlinearly [2] optimized WENO schemes. We compute dissipation budgets to compare the energy removal due to numerical dissipation with that due to the subgrid-scale terms. In addition, we assess traditional dynamic eddy viscosity and mixed models as well as approximate deconvolution models (ADM) [3] in highly compressible turbulence. Finally, the benefits and/or drawbacks of shock-confining filters to modify the LES filtering operation and avoid filtering across discontinuities are assessed. [1] Martin, M.P., Taylor, E.M., Wu, M., and Weirs, V.G., *J. Comp. Phys.* 220(1), 270-289, 2006. [2] Taylor, E.M., Wu, M., and Martin, M.P., *J. Comp. Phys.* 223(1), 384-397, 2007. [3] Stolz, S., Adams, N.A., and Kleiser, L., *Phys. Fluids* 13(10), 2985-3001, 2001. This work is sponsored by NASA Grant #NCC3-989.

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