

Abstract Submitted
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LES of Supersonic Turbulent Channel Flow at Mach Numbers 1.5 and 3¹ SRIRAM RAGHUNATH, GILES BRERETON, Michigan State University — LES of compressible, turbulent, body-force driven, isothermal-wall channel flows at Re_τ of 190 and 395 at moderate supersonic speeds (Mach 1.5 and 3) are presented. Simulations are fully resolved in the wall-normal direction without the need for wall-layer models. SGS models for incompressible flows, with appropriate extensions for compressibility, are tested *a priori* with DNS results and used in LES. Convergence of the simulations is found to be sensitive to the initial conditions and to the choice of model (wall-normal damping) in the laminar sublayer. The Nicoud–Ducros wall adapting SGS model, coupled with a standard SGS heat flux model, is found to yield results in good agreement with DNS.

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