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Evaluation of WENO Adaptation Modifications in DNS of Compressible Isotropic Turbulence Interacting with a Shock Wave ELLEN TAYLOR, PINO MARTIN, Princeton University — Weighted essentially non-oscillatory (WENO) methods have been developed to simultaneously provide robust shock-capturing in compressible fluid flow and avoid excessive damping of fine-scale flow features such as turbulence. Under certain conditions in compressible turbulence, however, numerical dissipation remains unacceptably high even after optimization of the linear component that dominates in smooth regions. We have therefore previously constructed and evaluated WENO schemes that also reduce dissipation due to two sources of *non*linear error: the smoothness measurement that governs the application of stencil adaptation away from the linear optimal stencil, and the general lack of synchronization between adaptive numerical stencils pertaining to up- and downwind interpolated convective fluxes. In the present work, we extend our tested flow configurations from direct numerical simulations (DNS) of one-dimensional Euler solutions and three-dimensional compressible isotropic turbulence to also include DNS of compressible isotropic turbulence interacting with a strong shock wave.

Ellen Taylor
Princeton University

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