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Anisotropic grid adaptation in LES SIAVASH TOOSI, JOHAN LARSSON, University of Maryland — The modeling errors depend directly on the grid (or filter) spacing in turbulence-resolving simulations (LES, DNS, DES, etc), and are typically at least as significant as the numerical errors. This makes adaptive grid-refinement complicated, since it prevents the estimation of the local error sources through numerical analysis. The present work attempts to address this difficulty with a physics-based error-source indicator that accounts for the anisotropy in the smallest resolved scales, which can thus be used to drive an anisotropic grid-adaptation process. The proposed error indicator is assessed on a sequence of problems, including turbulent channel flow and flows in more complex geometries. The formulation is geometrically general and applicable to complex geometries.

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