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On discretization errors and subgrid scale model implementations in Large Eddy Simulations BERNARD KNAEPEN, AXELLE VIRÉ, Université Libre de Bruxelles — We analyze the impact of discretization errors on the performance of the Smagorinsky model in Large Eddy Simulations (LES). To avoid difficulties related to solid boundaries, we focus on decaying homogeneous turbulence. It is shown that two numerical implementations of the model in the same finite volume code lead to significantly different results in terms of kinetic energy decay, time evolutions of the viscous dissipation and kinetic energy spectra. In comparison with spectral LES results, excellent predictions are however obtained with a novel formulation of the model derived from the discrete Navier-Stokes equations. We also highlight the effect of discretization errors on the measurement of physical quantities that involve scales close to the grid resolution.

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