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Stochastic Coherent Adaptive Large Eddy Simulation of forced isotropic turbulence with variable thresholding[1] GIULIANO DE STEFANO, Seconda Universita Napoli, Italy, OLEG V. VASILYEV, University of Colorado at Boulder — In this talk we discuss the progress in the development of the novel methodology for the numerical simulation of turbulent flows, called Stochastic Coherent Adaptive Large Eddy Simulation (SCALES). SCALES is an extension of the Large Eddy Simulation approach that uses a wavelet filter-based dynamic grid adaptation strategy to solve for the most energetic coherent structures in a turbulent flow field, while modelling the effect of the less energetic background flow with a local dynamic subgrid-scale (SGS) model. In contrast to previous formulations that used a global relative wavelet threshold, in this study we explore the *spatially variable* wavelet thresholding strategy to ensure the adequate resolution of local flow characteristics. For example, the local wavelet thresholding level can be adjusted by ensuring a prescribed level of SGS dissipation with respect to the resolved viscous dissipation. A number of numerical experiments for linearly forced homogeneous turbulence are presented and the results are compared with pseudo-spectral reference solutions. The agreement holds not only in terms of global statistical quantities but also in terms of spectral distribution of energy and, more importantly, enstrophy all the way down to the dissipative scales.

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