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Multiscale correlations in highly resolved Large Eddy Simulations[1] LUCA BIFERALE, MICHELE BUZZICOTTI, MORITZ LINKMANN, Dept. Physics and INFN University of Rome Tor Vergata — Understanding multiscale turbulent statistics is one of the key challenges for many modern applied and fundamental problems in fluid dynamics. One of the main obstacles is the existence of anomalously strong non Gaussian fluctuations, which become more and more important with increasing Reynolds number. In order to assess the performance of LES models in reproducing these extreme events with reasonable accuracy, it is helpful to further understand the statistical properties of the coupling between the resolved and the subgrid scales. We present analytical and numerical results focussing on the multiscale correlations between the subgrid stress and the resolved velocity field obtained both from LES and filtered DNS data. Furthermore, a comparison is carried out between LES and DNS results concerning the scaling behaviour of higher-order structure functions using both Smagorinsky or self-similar Fourier sub-grid models.

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