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**Signatures of non-universal large scales in conditional structure functions from eight different turbulent flows** GREG VOTH, DANIEL BLUM, Wesleyan University, EBERHARD BODENSCHATZ, MATHIEU GILBERT, HAITAO XU, MPI Goettingen, LAURENT MYDLARSKI, McGill University, ARMANN GYLFASON, Reykjavik University, P.K. YEUNG, Georgia Tech — We present a systematic comparison of conditional structure functions in eight turbulent flows. The flows studied include DNS of a periodic box, passive grid wind tunnel, active grid wind tunnel (in both synchronous and random driving modes), counter-rotating disks, oscillating grids, and the Lagrangian exploration module (in both constant and random driving modes). We compare longitudinal Eulerian second order structure functions conditioned on the instantaneous large scale velocity in order to assess ways in which the large scales affect the small scales in a wide variety of turbulent flows. Structure functions are shown to have larger values when the large scale velocity is large in all flows except the passive grid wind tunnel and DNS indicating that dependence on the large scales is typical in turbulent flows. The effects of the large scale velocity on the structure functions can be quite dramatic, with the structure function varying by up to a factor of 2 when the large scale velocity changes by 2 standard deviations. In general, the conditional dependence of the structure functions on the large scale velocity is similar at all scales which indicates large scale effects are scale independent.

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