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Quantifying the Effects of Large Scale Intermittency in Turbulence DANIEL BLUM, GREG VOTH, Wesleyan University — We report on the effect of fluctuating energy at the largest scales on various turbulence statistics. Measurements were made in a flow between oscillating grids which contains nearly homogeneous turbulence in an 1,100 l tank which produces R_lambda= 285. By modulating the oscillating grid frequency we can introduce temporal variations in the injected energy which allows us to control the level of large scale intermittency. We measure the effects of this large scale intermittency by conditioning Eulerian structure functions on the large scale velocity. With constant oscillating grid frequency, the conditional functions show a clear dependence on the large scale velocity, but increasing the large scale intermittency (by increasing the frequency modulation) substantially increases this dependence. Such control allows us to quantify the effects of large scale intermittency on the various length scales of the structure functions, down to the small scales.

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