Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Effects of anisotropy on the fluctuating dissipation scale IAN MAY, LAKSHMI PRASAD DASI, Colorado State Univerisity — The invariance of the dissipation scale distribution, $Q(\eta)$, to local measures of anisotropy at high Reynolds number is a necessary condition to support the notion of a universal and isotropic small-scale structure of turbulence. We examine the effects of varying levels of anisotropy on $Q(\eta)$ using a monte-carlo approach to model correlated spatial gaussian velocity ensembles. Anisotropy was modeled as a linear variation in velocity rms in space as is the case locally in strongly anisotropic turbulence. $Q(\eta)$ calculated from isotropic simulations matched recent mathematical distributions from the equations of motion and the multifractal formalism. However $Q(\eta)$ in anisotropic cases, where spatially increasing rms was modeled, systematically deviated from the isotropic expectations. Peak locations of $Q(\eta/\eta_0)$ shift left with increasing anisotropy, however a significant reduction in Reynolds number can induce an overall right shift. These results illustrate contrasting effects between local anisotropy and low Reynolds number with respect to the small-scale structure of the dissipative scales of motion.

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Date submitted: 01 Aug 2013 Electronic form version 1.4