Experimental measurement of power input fluctuation in a turbulent flow DANIEL LATHROP, BARBARA BRAWN, University of Maryland, NICOLAS MUJICA, Universidad de Chile — We study the power input fluctuations in a turbulent flow driven by body forces. The local velocity is measured in a system driven by a known pattern of Lorentz forces. The local power input is computed $P = \vec{F} \cdot \vec{v}$ and studied in the context of the Fluctuation-Dissipation theorem. This liquid sodium flow has a Reynolds number $R \sim 10^4$ leading to turbulent fluctuations in the local power inpug. The probability distribution of the power input is consistent with predictions from the Fluctuation-Dissipation theory, even though that should only apply to the spatially averaged input power. These results can be interpreted as suggesting a generalization to the theoretical ideas for far from equilibrium systems.

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