

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Fluctuations of entropy production rate in turbulent thermal convection FRANCESCO ZONTA, Dept. of Elec., Manag., and Mechanical Engineering, University of Udine, Udine, Italy, SERGIO CHIBBARO, UPMC Univ Paris 06, UMR 7190, Institut Jean Le Rond d'Alembert, F-75005, Paris, France — We use Direct Numerical Simulation (DNS) to compute the entropy production rate (σ) in turbulent thermal convection. The overall entropy production rate is measured injecting a large number of pointwise lagrangian tracers within the flow and simultaneously sampling velocity and temperature fields along the tracers trajectory. For an isolated system, classical thermodynamics prescribes that σ always increases until equilibrium. However, we show here that the entropy production rate is characterized by large fluctuations and becomes often negative. We also discuss the fluctuations of σ averaged over a time lag τ in the framework of the fluctuation theorem.

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Date submitted: 30 Jul 2015

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