

Entropy Production and Fluctuation Theorems

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Most dynamic processes in nature are nonequilibrium (NEQ) processes, which include key processes in biological cells and social networks, as well as usual physical phenomena. Recently, there has been a considerable progress on the issue of the thermodynamic second law, which is known as the law of entropy increase or irreversibility. In particular, theorists now can predict how often NEQ processes violate the law of entropy increase. Violations disappear in the thermodynamic limit, but can be observed reasonably well in small systems. In this talk, I will briefly introduce the fluctuation theorems and discuss some experiments.