

# An elementary introduction to the fluctuation theorem for chaotic dynamical systems.

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We present a general framework for deriving the fluctuation relation for deterministic and stochastic systems. After introducing some simple objects related to the entropy production, we show that the fluctuation relation as proposed by Evans-Searles, Gallavotti-Cohen, and Lebowitz-Spohn is a consequence of the large deviations principle (LDP). We next turn to a class of chaotic dynamical systems and study the validity of the LDP and fluctuation relation. Under rather general hypotheses allowing for phase transitions, we prove that the occupation measures satisfies an LDP with a convex good rate function for which a generalisation of the fluctuation relation holds.

This is a joint work with N. Cuneo, V. Jaksic and C.-A. Pillet.