

Quantum martingale theory for entropy production along quantum jump trajectories

Gonzalo MANZANO - Scuola Normale, Pisa & ICTP

We develop a martingale theory to describe fluctuations of entropy production for open quantum systems in nonequilibrium steady states. Using the formalism of quantum jump trajectories, we identify a decomposition of entropy production into an exponential martingale and a purely quantum term, both obeying integral fluctuation theorems. An important consequence of this approach is the derivation of a set of genuine universal results for stopping-time and infimum statistics of stochastic entropy production. Finally we complement the general formalism with numerical simulations of a qubit system.