

Irreversible entropy production in non-equilibrium quantum processes

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The characterization of irreversibility in general quantum processes is an open problem of increasing technological relevance. Yet, the tools currently available to this aim are mostly limited to the assessment of dynamics induced by equilibrium environments, a situation that often does not match the reality of experiments at the microscopic and mesoscopic scale. In this talk I will propose a theory of irreversible entropy production that is suited for quantum systems exposed to general, non-equilibrium reservoirs. I will illustrate the framework by addressing a set of physically relevant situations that clarify both the features and the potential of such an approach.