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Non-adiabaticity and irreversible entropy production in the quantum regime

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Finite-time thermodynamic transformations typically lead to the generation of energetic coherence in the out-of-equilibrium state of a quantum system; indeed, it is possible to identify a contribution to the irreversible entropy production that is due to coherence generation.
On the other hand, coherence is connected also to the non-adiabaticity of a processes, for which it gives the dominant contribution for slow-enough transformations. With the help of fluctuation theorems, we will provide a full characterization of the irreversible
entropy generated because of deviation from adiabaticity (i.e., diabatic transition), and because of coherence production.

Theme

Theme 2. Quantum effects in energy processes and materials

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Track Classification: Theme 1. Energy advantage and cost of quantum technology