## Joint Annual Meeting of the Swiss and Austrian Physical Society 2023



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## [151] Entanglement and thermo-kinetic uncertainty relations in coherent mesoscopic transport

Thursday 7 September 2023 17:00 (15 minutes)

Some aspects concerning coherence in open quantum systems remain poorly understood. On the one hand, coherence leads to entanglement and nonlocality. On the other, it leads to a suppression of fluctuations, causing violations of classical thermo-kinetic uncertainty relations. These represent its different manifestations, one depending only on the state of the system and one depending on two-time correlation functions. We employ these manifestations to determine when mesoscopic quantum transport through a double quantum dot can be captured by a classical jump model, and when such model breaks down implying nonclassical behavior. Quantum tunneling induces Rabi oscillations and results in both manifestations of coherence, indicating the breakdown of a classical description.

## **Theoretical Work**

Theory

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