

Mini-lecture 1: Entropic fluctuations in quantum two-time measurement framework

Wednesday, January 31, 2024 2:00 PM (50 minutes)

Non-equilibrium statistical mechanics has seen some impressive developments in the last three decades, since the ground-breaking formulation of the transient and steady entropic Fluctuation Relations (FR) in the early nineties.

The extension of these results to the quantum setting has turned out to be surprisingly challenging and it is still an ongoing effort. Kurchan's seminal work (2000) showed quantum formulation of the transient version of FR is possible by introducing two time measurement framework.

In this mini course, we present some recent results where we attempt to introduce a quantum equivalent of steady entropic functional and compare it the transient version for open quantum system.

We consider both the case of idealised direct measurement on the reservoirs and experimentally accessible indirect measurement through coupling with an ancilla. We analyse in particular stability with respect to the initial state.

In order to deal with the thermodynamics limit and to have general results, we use methods of C^* -algebras and modular theory.

(Joint work with T. Benoist, L. Bruneau, V. Jakšić)

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