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Balades Quantiques de le LPENS

Jeudi 29 Septembre 2022, 12 :45
LPENS, room L367
Domaines : cond-mat

Titre : *Symmetry breaking and Entanglement transitions in driven-dissipative systems*

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Résumé : *Quantum systems evolving unitarily and subject to quantum measurements exhibit various types of non- equilibrium phase transitions, arising from the competition between unitary evolution and measurements. Dissipative phase transitions in steady states of time-independent Liouvillians and measurement induced phase transitions at the level of quantum trajectories are two primary examples of such transitions. Investigating a many-body spin system subject to periodic resetting measurements, we argue that many- body dissipative Floquet dynamics provides a natural framework to analyze both types of transitions. We show that a dissipative phase transition between a ferromagnetic ordered phase and a paramagnetic disordered phase emerges for long-range systems as a function of measurement probabilities. A measurement induced transition of the entanglement entropy between volume law scaling and sub-volume law scaling is also present, and is distinct from the ordering transition. The two phases correspond to an error-correcting and a quantum-Zeno regimes, respectively. The ferromagnetic phase is lost for short range interactions, while the volume law phase of the entanglement is enhanced.*