

Post-Quantum Quench Growth of Renyi Entropies in Perturbed Luttinger Liquids

Friday, 27 May 2022 10:00 (1 hour)

The growth of Renyi entropies after the injection of energy into a correlated system provides a window upon the dynamics of its entanglement properties. We provide here a scheme by which this growth can be determined in Luttinger liquids systems with arbitrary interactions, even those introducing gaps into the liquid. This scheme introduces the notion of a generalized mixed state Renyi entropy. We show that these generalized Renyi entropies can be computed and provide analytic expressions thereof. Using these generalized Renyi entropies, we provide analytic expressions for the short time growth of the second and third Renyi entropy after a quantum quench of the coupling strength between two Luttinger liquids, relevant for the study of the dynamics of cold atomic systems. For longer times, we use truncated spectrum methods to evaluate the post-quench Renyi entropy growth.

Presenter: KONIK, Robert (Brookhaven National Laboratory)