

Workshop on Integrability



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Dynamics of charge-imbalance-resolved entanglement negativity after a quench in a free-fermion model

Thursday, 31 March 2022 09:00 (1 hour)

The presence of a global internal symmetry in a quantum many-body system is reflected in the fact that the entanglement between its subparts is endowed with an internal structure, namely it can be decomposed as sum of contributions associated to each symmetry sector. The study of the symmetry resolution of entanglement measures provides a formidable tool to probe the out-of-equilibrium dynamics of quantum systems.

As presented in the previous edition of this Workshop by my collaborator Gilles Perez, we initiated the study of the time evolution of the symmetry-resolved entanglement entropy after a global quench in the context of free-fermion systems. In this talk, I will present the results of our subsequent study of the time evolution of its counterpart for non-complementary subsystems, namely the charge-imbalance-resolved negativity, in the same setting. We find that the charge-imbalance-resolved logarithmic negativity shows an effective equipartition in the scaling limit of large times and system size, with a perfect equipartition for early and infinite times. We also derive and conjecture a formula for the dynamics of the so-called charged Rényi logarithmic negativities. We argue that our results can be understood in the framework of the quasiparticle picture for the entanglement dynamics, and provide a conjecture that we expect to be valid for generic integrable models.

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Track Classification: Participants Talks: Abstracts of Participants Talks