

Intermediate-time dynamics in out-of-equilibrium spin chains

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I discuss some aspects of quench dynamics in quantum many-body systems. In the first part of the talk, I present an unusual mechanism of prethermalization. This is based on the presence of a symmetry of the pre-quench Hamiltonian which is spontaneously broken at zero temperature and is explicitly broken by the post-quench Hamiltonian.

In the second part of the talk, I focus on the non-equilibrium time evolution of piecewise homogeneous states. The inhomogeneity of the initial state gives rise to a peculiar intermediate-time dynamics that is captured by a hydrodynamic description. I present the solution to the dynamics in the XXZ spin-1/2 chain and describe some remarkable properties of the profiles of charges and currents.