
Quantum quench for the nonlocal Luttinger model

Zhituo Wang^{*1}

¹Center for Mathematical Sciences in Shanghai (CMSS) – China

Abstract

I shall talk about some aspects of the nonequilibrium dynamics of the Luttinger model with non-local interaction. We consider the time evolution of an inhomogeneous state with a localized Fermion added to the non interacting ground state.

In absence of interaction the averaged density has two peaks moving in opposite directions with constant velocities. If the state is evolved with the interacting Hamiltonian two main effects appear. The first is that the peaks have velocities which are not constant but vary between a minimal and maximal value. The second is that a dynamical ‘Landau quasi-particle weight’ appears in the oscillating part of the averaged density, asymptotically vanishing with time, as a consequence of the fact that Fermions are not excitations of the interacting Hamiltonian. These result are found with the method of Lieb-Mattis. I shall also talk about the rigorous Bosonization method which is mathematically rigorous and is an easier way to obtain these results.

*Speaker