Effect of interactions in a system with quenched hopping rates and periodic boundaries

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Abstract

We study the non-equilibrium steady state in a system with periodic boundaries consisting of interacting particles obeying exclusion principle with quenched hopping rate. Using Simple Mean Field approach (SMF) wherein all correlations between the particles are neglected, it is observed that the results drastically deviate from that obtained by Monte Carlo Simulations (MCS). We wish to obtain answers to the following questions. What advanced theory can be applied to obtain the dynamics of such a system? Do the qualitative properties of the system change with the inclusion of the interactions? Can the shock, that appears in a non-interacting system, be smoothed out by the interactions?

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