Abstract Submitted
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Current reversals and metastable states in the infinite Bose-Hubbard chain with local particle loss[1] MAXIMILIAN KIEFER-EMMANOUILIDIS, University of Kaiserslautern, Kaiserslautern, Germany, JESKO SIRKER, University of Manitoba, Winnipeg, Canada — Many-body interactions lead to unexpected effects in the open Bose-Hubbard model. When the model is subjected to local loss, particle currents are induced. Away from the dissipative site the currents start to reverse their direction at intermediate and long times. This leads to a metastable state with a total particle current pointing away from the dissipative site. We studied the model numerically by combining a quantum trajectory approach with a density-matrix renormalization group scheme. An alternative equation of motion approach based on an effective fermion model shows that the reversal of currents can be understood qualitatively by the creation of holon-doublon pairs at the edge of the region of reduced particle density. The doublons are then able to escape while the holes move towards the dissipative site.

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