

Abstract Submitted
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Real-time dynamics of spinons and holons in one-dimensional correlated electron systems H. ONISHI, Oak Ridge National Laboratory (ORNL), and Japan Atomic Energy Agency, I. GONZALEZ, ORNL and University of Tennessee, R. MELKO, University of Waterloo, E. DAGOTTO, ORNL and University of Tennessee — To clarify the properties of spin-charge separation in correlated electron systems, we study the real time evolution of wavepackets carrying spinons and holons in a one-dimensional Hubbard model, using the time-dependent density-matrix renormalization group method. In the bulk, while spinons and holons move with the same velocity in the non-interacting chain, it is observed that in the interacting Mott insulator they move in opposite directions each with its own individual velocity. Thus, spin-charge separation is clearly observed. On the other hand, when the Mott insulator is connected to a non-interacting chain, the wavepackets created in the Mott insulator moving toward the non-interacting region exhibit interesting reflection and transmission properties at the interface between the two regions, that will be discussed in this presentation. The differences between Mott and band insulators are also discussed.

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