

Abstract Submitted  
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**The local density of states of a finite quantum wire: New insights from DMRG and bosonization<sup>1</sup>** IMKE SCHNEIDER, MICHAEL BORTZ, ALEXANDER STRUCK, SEBASTIAN EGGERT, University of Kaiserslautern — We consider interacting Fermions on a finite one-dimensional lattice. By using an adapted DMRG algorithm we are able to calculate the energy and spatially resolved local density of states (LDOS) for the lattice model directly without using time-dependent correlations. We compare to analytic expressions for individual energy levels in systems with open boundary conditions from Luttinger Liquid theory. In this way, a detailed understanding of the LDOS for each individual energy level can be obtained in both fermionic and bosonic pictures. Certain degeneracies of the Luttinger Liquid spectrum are lifted in the lattice model by band curvature and interaction effects, leading to a large number of states and energy levels in the LDOS. The standing waves in the LDOS reveal the collective bosonic excitations explicitly.

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