

Abstract Submitted  
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**Rectification in an idealized model junction of strongly correlated electrons**<sup>1</sup> FLORIAN SABOU, NATALIE BODINGTON-ROSEN, BRAD MARSTON, Brown University — Junctions of oppositely doped Mott insulators offer the possibility of rectification at extremely high frequencies. To simulate an idealized junction we use a model of spinless electrons moving in one dimension, the t-V chain, and control the chemical potential on the two halves of the chain to create a p-n junction. For short chains the many-body Schrodinger equation can be integrated forward in time numerically exactly, and we find that when subjected to an oscillating electric field the system rectifies by transferring charge in a preferred direction. Dissipation can be included in a phenomenological way by rotating time slightly off the real axis. The time dependent density-matrix renormalization-group may be used to extend the simulation to longer chains with spinning electrons.

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