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Tunneling Signatures of a Majorana Chain at the Quantum Spin Hall Edge VASUDHA SHIVAMOGGI, University of California, Berkeley, GIL REFAEL, California Institute of Technology, JOEL MOORE, University of California, Berkeley — A 1D chain of Majorana fermions can be created using an array of ferromagnetic and superconducting regions at the quantum spin Hall edge. By mapping the system to the transverse-field Ising spin chain, it is possible to study the behavior of thermodynamic and transport quantities at the random critical point. We examine critical transport properties of the Majorana chain by using a real-space renormalization group method, with each step expressed as a unitary transformation on the Hamiltonian of the Majorana chain. Successive steps transform the weakly interacting chain to multiple copies of the two-Majorana problem. The density of states and the tunneling along the chain are calculated from the universal distribution of the formed pairs. This approach can be generalized to weakly dimerized Majorana chains, and can be equally used to obtain transport properties of the random transverse-field Ising model.

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