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Quantum quenching through a topological phase transition in a system with open boundaries VASUDHA SHIVAMOGGI, SMITHA VISHVESHWARA, University of Illinois, Urbana-Champaign, DIPTIMAN SEN, Indian Institute of Science — We study the effect of open boundaries on the non-adiabatic dynamics of a system driven across a topological phase transition. The closing of the bulk gap at the critical point implies that a quantum quench across the critical point necessarily results in a states with defects. The presence of mid-gap surface states in a topological phase modifies the usual Kibble-Zurek scaling used to describe the defect density. We investigate the phase transition in a 1D spinless p-wave superconductor between a non-topological phase and a topological phase with Majorana fermions localized at the ends. We calculate the non-adiabatic evolution of the ground state across the transition and the overlap of this state with the instantaneous ground state. We also discuss the consequences of the topologically protected edge states on defect production.

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