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Quenching across a quantum critical point: non-trivial power laws in different topological sectors DIPTIMAN SEN, Indian Institute of Science, Bangalore, SMITHA VISHVESHWARA, University of Illinois, Urbana-Champaign — We study what happens when the Hamiltonian of a system with different topological sectors is quenched at a finite rate across a quantum critical point. We show that the quenching leads to a residual energy which scales as a power of the quenching rate, where the power depends on the topological sector in a non-trivial way. This generalises the idea of a Landau-Zener transition in two important ways: depending on the sector, the analysis may involve more than two states, and the effective Hamiltonian in the low-energy subspace may involve non-linear quenching even when the quenching of the original Hamiltonian is linear in time. We also discuss how one can dynamically evolve from one topological sector to another. As a specific example, we discuss all these ideas in the context of the Kitaev model defined on a two-leg ladder which can be studied by introducing Majorana fermions.

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