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Quantum Quenches in Topological Systems[1] GRAHAM KELLS, National University of Ireland Maynooth, DIPTIMAN SEN, Centre for High Energy Physics, Indian Institute of Science, J.K. SLINGERLAND, National University of Ireland Maynooth, SMITHA VISHVESHWARA, University of Illinois at Urbana-Champaign — We study the non-equilibrium dynamics of quenching through a quantum critical point in topological systems, focusing on one of their characteristic features, namely, ground state degeneracies, and associated topological sectors. We present the notion of "topological blocking," experienced by the dynamics due to the mismatch in degeneracies between two phases. We demonstrate the interplay between quenching and topology in two extensively studied systems, the transverse Ising chain and the Kitaev honeycomb model. Casting these systems in the language of fermionic spinless p-wave paired superconductors enables us to cleanly address degeneracies, subtle issues of fermion occupation and parity, and mismatches between topological sectors. We show that several features of the quench, which are related to Kibble-Zurek physics, are sensitive to the topological sector being probed.

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