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Edge state contributions to the Loschmidt echo in topological insulators and superconductors NICHOLAS SEDLMAYR, Institute of Mathematical and Theoretical Physics, Michigan State University, ELIO KÖNIG, ALEX LEVCHENKO, Department of Physics, University of Wisconsin-Madison — Non-analytic behavior in the time evolution of a quantum system at critical times can be seen in the Loschmidt echo, the overlap between a time evolved state and an initial state. This is referred to as a dynamical phase transition, an analogue of the non-analytic behavior in the free energy across temperature driven phase transitions. In particular it has been demonstrated that in topological systems a quench across the topological phase transition and dynamical phase transitions are intimately related. Here we look at the contribution to the Loschmidt echo of the topologically protected edge states of 1D topological insulators and superconductors. These edge state have already been shown to have interesting contributions to the fidelity and entanglement entropy, which can also be useful for characterizing the topological phases and phase transitions.

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