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Ramping through a topological critical point in two dimensions
MARIN BUKOV, PHILLIP WEINBERG, MICHAEL KOLODRUBETZ, Boston Univ — The recent realisation of Floquet Chern insulators has resulted in a prolific study of periodically driven models. In order to probe equilibrium physics, the driving protocol is gently ramped up, in the process of which the system undergoes a dynamical phase transition to a topologically non-trivial state. Since such transitions are controlled by closing and re-opening a band gap, the notion of adiabaticity inevitably breaks down and the system gets excited. In this talk, I shall present recent results based on scaling arguments within Kibble-Zurek theory to study the excitations due to a ramp through a topological critical point in 2 dimensions. I shall show convincing evidence that the occupation of the chiral edge modes follows similar universal scaling as the bulk as a function of the ramp speed and the system size. Further, I shall apply these results to study the build-up of magnetisation due to the non-adiabatic population of the edge states in Haldane's model of graphene, which has recently been proposed to detect the topological character of the state of the system. Finally, I shall show that the quantisation of magnetisation is robust against non-adiabaticity due to crossing the critical point.

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