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Anti-Kibble-Zurek behavior in Su–Schrieffer–Heeger (SSH) model with noisy coupling crossing the quantum critical point

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Abstract

In this paper we show that if we impose noise to the time varying coupling parameter of a closed system, then the system exhibits anti-Kibble-Zurek behavior leading to growth of excitations. Furthermore, our finding indicates that to minimize excitations, there is optimal ramp time, which is proportional to the noise strength but the exponent does not show agreement with the results of previous works. It is demonstrated there are restrictions of adiabatic protocols, like quantum annealing, and the rate of optimal ramp time is universal.

Keywords: Kibble-Zurek mechanism, Su–Schrieffer–Heeger (SSH) model

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