

Abstract Submitted
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Dynamical non-ergodic scaling in continuous finite-order quantum phase transitions SHUSA DENG, GERARDO ORTIZ, LORENZA VIOLA, Dartmouth College — We investigate the emergence of universal dynamical scaling in quantum critical spin systems adiabatically driven out of equilibrium, with emphasis on quench dynamics which involves non-isolated critical points (i.e., critical regions) and cannot be a priori described through standard scaling arguments nor time-dependent perturbative approaches. Comparing to the case of an isolated quantum critical point, we find that non-equilibrium scaling behavior of a large class of physical observables may still be explained in terms of equilibrium critical exponents. However, the latter are in general non-trivially path-dependent, and detailed knowledge about the time-dependent excitation process becomes essential. In particular, we show how multiple level crossings within a gapless phase may completely suppress excitation depending on the control path. Our results typify non-ergodic scaling in continuous finite-order quantum phase transitions.

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