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Anomalous non-ergodic scaling in adiabatic multicritical quantum quenches SHUSA DENG, Department of Physics and Astronomy, Dartmouth College, GERARDO ORTIZ, Department of Physics, Indiana University, LORENZA VIOLA, Department of Physics and Astronomy, Dartmouth College — We investigate non-equilibrium dynamical scaling in adiabatic quench processes across quantum multicritical points. Our analysis shows that the resulting power-law scaling depends sensitively on the control path, and that anomalous critical exponents may emerge depending on the universality class. We argue that the observed anomalous behavior originates in the fact that the dynamical excitation process takes place asymmetrically with respect to the static multicritical point, and that non-critical energy modes may play a dominant role. As a consequence, dynamical scaling requires introducing new non-static exponents.

Shusa Deng
Department of Physics and Astronomy, Dartmouth College

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