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Dynamic Quantum Phase Transitions in Holographic Superconductors MOON JIP PARK, MATTHEW GILBERT, Univ of Illinois - Urbana — A non-equilibrium quench that crosses a quantum critical point is known to exhibit distinct behavior from trivial quench. This is readily apparent via examination of the Loschmidt echo that contains the Yang-Lee (YL) zeros in the non-equilibrium quench within the vanishing returning rate of ground state when the quantum critical point is crossed. While previous studies on the dynamical quenches are restricted within non-interacting systems, we use of the Loschmidt echo to understand quenches within strongly interacting conformal field theories using holographic mapping. We show that the free energy of the gravitational dual possesses YL zeros at the superconducting critical temperature. We argue that, on the gravitational side, the presence of YL zeros implies that the free energy is invariant under a set of discrete deformations of the metric characterized by the time at which the returning rate vanishes. We illustrate these ideas using a holographic superconductor constructed via the coupling of AdS gravity with a Maxwell field and charged scalar.

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