

Abstract Submitted
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Quantum Criticality Due to Incipient Phase Separation in the Two-dimensional Hubbard Model¹ EHSAN KHATAMI, KARLIS MIKELSONS, Georgetown University, ALEXANDRU MACRIDIN, Fermi Lab, RICHARD SCALETTAR, University of California, Davis, DIMITRIOS GALANAKIS, JUANA MORENO, MARK JARRELL, Louisiana State University — We investigate the two-dimensional Hubbard model with next-nearest-neighbor hopping, t' , using the dynamical cluster approximation. We confirm the existence of a first order phase separation transition terminating at a second order critical point at filling $n_c(t')$ and temperature $T_{ps}(t')$. We find that as t' approaches zero, $T_{ps}(t')$ vanishes and $n_c(t')$ approaches the filling associated with the quantum critical point separating the Fermi liquid from the pseudogap phase. We propose that the quantum critical point under the superconducting dome is the zero temperature limit of the line of second order critical points.

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