Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Thermodynamics of the quantum critical point at finite doping in the two-dimensional Hubbard model studied via the dynamical cluster approximation KARLIS MIKELSONS, EHSAN KHATAMI, Georgetown University, DIMITRIOS GALANAKIS, Louisiana State University, ALEXANDRU MACRIDIN, Fermilab, JUANA MORENO, MARK JARRELL, Louisiana State University — We study the thermodynamics of the two-dimensional Hubbard model within the dynamical cluster approximation. We use continuous time quantum Monte Carlo as a cluster solver to avoid the systematic error which complicates the calculation of the entropy and potential energy (double occupancy). We find that at a critical filling, there is a pronounced peak in the entropy divided by temperature, S/T, and in the normalized double occupancy as a function of doping. At this filling, we find that specific heat divided by temperature, C/T, increases strongly with decreasing temperature and kinetic and potential energies vary like $T^2 \ln T$. These are all characteristics of quantum critical behavior.

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Date submitted: 18 Nov 2009 Electronic form version 1.4