Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Unconventional Superconductivity near a Kondo Destroyed Quantum Critical Point JEDEDIAH PIXLEY, Rice University, LILI DENG, KEVIN INGERSENT, University of Florida, QIMIAO SI, Rice University — Heavy fermion metals serve as prototypical correlated materials to study antiferromagnetic quantum critical points (QCPs). Theoretical studies have identified a class of unconventional quantum critical points, in which Kondo destruction accompanies the onset of magnetic order. Whether or not such a QCP may promote superconductivity is an open question. Experimentally, there is strong evidence, e.g. from the heavy-fermion material $CeRhIn_5$, that such a QCP underlies unconventional superconductivity. With this in mind, we study the superconducting pairing susceptibility in the periodic Anderson model, within a cluster extended dynamical mean field theory (C-EDMFT). We find that the Kondo energy scale is continuously suppressed at the magnetic QCP. In addition, we find the pairing susceptibility to be strongly enhanced when the QCP is approached, both from the paramagnetic Kondo screened side and from the Kondo-destroyed magnetically ordered side. Our results point to a new form of unconventional superconductivity associated with both the magnetic fluctuations and a proximity to electronic localization.

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Date submitted: 15 Nov 2013 Electronic form version 1.4