High-temperature signatures of quantum criticality in heavy fermion systems

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We propose a new criterion for distinguishing the Hertz-Millis (HM) and the local quantum critical (LQC) mechanism in heavy fermion systems with a magnetic quantum phase transition (QPT). The criterion is based on our finding that the spin screening of Kondo ions can be completely suppressed by the RKKY coupling to the surrounding magnetic ions even without magnetic ordering and that, consequently, the signature of this suppression can be observed in spectroscopic measurements above the magnetic ordering temperature. We apply the criterion to high-resolution photoemission (UPS) measurements on CeCu$_{6-x}$Au$_{x}$ and conclude that
the QPT in this system is dominated by the LQC scenario.