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Quantum Criticality in the strongly correlated 3d electron system YFe_2Al_{10} L.S. WU, Stony Brook University, K. PARK, Y. JANSSEN, M.S. KIM, C. MARQUES, Brookhaven National Lab, M.C. ARONSON, Stony Brook University, Brookhaven National Lab — YFe_2Al_{10} has recently been identified as a strongly correlated 3d - electron system that is located very close to a quantum critical point (QCP). At low temperatures, divergences were found in the ac magnetic susceptibility ($\chi' \propto T^{-1.3}$) and magnetic specific heat ($C_M/T \propto T^{-0.47}$) based on the measurements carried out on single crystals. The magnetic Gruneisen ratio determined from these measurements ($\Gamma/H = -\frac{1}{T}\frac{\partial S/\partial B}{\partial S/\partial T} = -\frac{\partial M/\partial T}{C}$) also shows a strong divergence as $T \rightarrow 0$, which is suppressed in fields indicating a quantum critical point at B=0. When applying magnetic field, Fermi liquid like behavior with an enhanced magnetic susceptibility χ_0 and Sommerfeld coefficient C/T emerges at T<T_{FL}, and this enabled us to establish a field temperature (B-T) phase diagram with a crossover temperature T_{FL}(B) coming out from the QCP at B=0. This is very similar to the quantum critical behavior observed in many f-electron based heavy fermion (HF) systems, and it makes YFe_2Al_{10} an interesting 3d- electron candidate for studying quantum criticality.

[X] Prefer Oral Session
[ ] Prefer Poster Session

Liusuo Wu
lwu@bnl.gov
Stony Brook University

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