

field-dependent in the vicinity of B_c below T_N . This signals (in a simple single-band picture) an increase of the effective carrier concentration when B exceeds the critical field B_c of antiferromagnetic order. Our data will be compared to recent experiments on YbRh_2Si_2 , where a kink of the Hall coefficient R_H at B_c was inferred for $T \rightarrow 0$ from the gradual change of slope of $\rho_{xy}(B)$ for finite T , becoming more pronounced for $T \rightarrow 0$ [2].

- [1] H. v. Löhneysen et al., Eur. Phys. J. B **5** (1998) 447
 [2] S. Paschen et al., Nature **432** (2004) 881.

TT 20.12 Wed 14:00 Poster A

DC-Susceptibility of $\text{CeCu}_{6-x}\text{Au}_x$ at very low temperatures — ●ANDREAS HAMANN¹, TIHOMIR TOMANIC¹, HILBERT V. LÖHNEYSSEN^{1,2}, and OLIVER STOCKERT³ — ¹Physikalisches Institut, Universität Karlsruhe, 76128 Karlsruhe — ²Forschungszentrum Karlsruhe, Institut für Festkörperphysik, 76021 Karlsruhe — ³MPI für chemische Physik fester Stoffe, 01187 Dresden

CeCu_6 is a prototype heavy-fermion system that is rather well described by Fermi liquid (FL) theory. Au doping introduces long-range incommensurate antiferromagnetism for $x > x_c \approx 0.1$. In the vicinity of the quantum critical point x_c significant deviations from FL theory have been observed in measurements of the specific heat, magnetic susceptibility and the electrical resistivity. In addition, highly unusual features were observed in inelastic neutron scattering [1,2]. In particular, the energy integrated dynamical as well as the static susceptibility could be described by $\chi^{-1} \propto (\theta(q))^\alpha + cT^\alpha$ with $\alpha = 0.75$ [1]. We report measurements of the low-field dc-susceptibility $\chi(T)$ of $\text{CeCu}_{5.9}\text{Au}_{0.1}$ and $\text{CeCu}_{5.85}\text{Au}_{0.15}$ down to temperatures around 40 mK. Our data for $x = 0.1$ show for $T \lesssim 200$ mK deviations from the above χ^{-1} expression signaling a crossover for a smaller exponent α than previously found for higher T and B . For $x = 0.15$ we see clear experimental evidence for the sharp onset of antiferromagnetic order below $T_N \approx 82$ mK for $x = 0.15$. We compare our data in detail with the previous work [1].

- [1] A. Schröder et al., Nature **407**, 6802 (2000)
 [2] O. Stockert et al., Phys. Rev. Lett. **80**, 5627 (1998)

TT 20.13 Wed 14:00 Poster A

Quantenphasenübergänge in NbFe_2 — ●CARSTEN ALBRECHT¹, MANUEL BRANDO², WILL DUNCAN¹, DENNIS MORONIKLEMENTOWICZ¹, DANIEL GRÜNER², RAFIK BALLOU³, BJORN FAK⁴, GUIDO KREINER² und F. MALTE GROSCHKE¹ — ¹Dept. of Physics, Royal Holloway, University of London, Egham, UK — ²MPI-CPfS, Nöthnitzer Str. 40, Dresden — ³CNRS, Grenoble — ⁴CEA DRFMC, SPSMS, Grenoble

Was geschieht mit metallischen Ferromagneten bei Annäherung an ihren quantenkritischen Punkt (QKP), wenn der magnetische Übergang kontinuierlich unterdrückt wird?

In einigen bisher untersuchten Fällen, insbesondere den stöchiometrischen Verbindungen MnSi und ZrZn_2 , verdeckt die Wandlung zu Phasenübergängen 1. Ordnung den erwarteten QKP. Ein anderes Szenario wird möglicherweise in dem verwandten System NbFe_2 realisiert: NbFe_2 existiert dicht an der Schwelle zum Ferromagnetismus, erkennbar an seinem stark erhöhten Stonerfaktor $\simeq 120$ (bezogen auf die gerechnete Zustandsdichte), nimmt aber unterhalb von etwa 20 K vermutlich eine bisher nicht genau identifizierte Spindichtewellenordnung an. Sowohl leichter Fe- als auch leichter Nb- Überschuss im Bereich von einem Prozent führen zu itinerantem Ferromagnetismus. Unsere Untersuchungen an Proben aus den bisher identifizierten Bereichen des Zusammensetzungs-Phasendiagramms sowie eine Reihe von Hochdruckmessungen weisen darauf hin, dass in NbFe_2 der ferromagnetische QKP durch Wandlung von Ferromagnetismus zu langwellig modulierter Spindichtewellen- bzw. Spiralordnung verdeckt wird.

TT 20.14 Wed 14:00 Poster A

Magnetic-field-induced Change of the Fermi Surface in CeBiPt — ●M BARTKOWIAK¹, B BERGK¹, Y SKOURSKI¹, J WOSNITZA¹, I OPAHLE², S ELGAZZAR², M RICHTER², H V LÖHNEYSSEN^{3,4}, T YOSHINO⁵, and T TAKABATAKE⁵ — ¹Hochfeld-Magnetlabor Dresden (HLD) FZ Dresden-Rossendorf, 01328 Dresden — ²IFW Dresden, PO Box 270116, 01171 Dresden — ³Physikalisches Institut, Universität Karlsruhe — ⁴Institut für Festkörperphysik, FZ Karlsruhe — ⁵Department of Quantum Matter, ADSM, Hiroshima University

Comparative experiments between the two semimetals CeBiPt and LaBiPt reveal changes of the Fermi surface in CeBiPt with respect to temperature, applied magnetic field and chemical composition. It must be concluded that the strong temperature dependence of the

Shubnikov-de Haas (SdH) frequency as well as the change of carrier concentration above a sample dependent critical field are associated with the $4f$ electrons introduced by the Ce atoms. We present Hall and magnetoresistance measurements up to 70 T obtained at our new pulsed high magnetic field laboratory in Dresden. We observe the disappearance of the SdH signal and a change of the Hall coefficient above a sample-dependent threshold field. Rather than at 25 T, as reported previously, we measured a threshold field of ≈ 40 T demonstrating the strong dependence of the Fermi surface on stoichiometry.

TT 20.15 Wed 14:00 Poster A

Inelastic Neutron Scattering on the Antiferromagnetic Half-Heusler Alloy CeBiPt — ●GERNOT GOLL¹, OLIVER STOCKERT², TOBIAS UNRUH³, PETER LINK³, K. SHIGETOH⁴, and T. TAKABATAKE⁴ — ¹Physikalisches Institut, Universität Karlsruhe, 76128 Karlsruhe — ²Max-Planck-Institut CPfS, 01187 Dresden — ³ZWE FRM-II, Technische Universität München, 85747 Garching — ⁴Hiroshima University, Higashi-Hiroshima, Japan

CeBiPt is a semimetal with a rather low charge carrier concentration $n = 7.7 \cdot 10^{17} \text{ cm}^{-3}$. Below $T_N \approx 1$ K antiferromagnetic order occurs as evidenced by sharp maxima in the thermodynamic properties. Neutron diffraction experiments have revealed an AF-type I structure with a propagation vector $\tau = (1\ 0\ 0)$ and moments also along $[1\ 0\ 0]$. The ordered moment $\mu \approx 0.6 \mu_B$ is much lower than the effective moment determined from the Curie-Weiss behavior of the susceptibility at higher T . Crystal-electric field (CEF) splitting of the Ce^{3+} level might be one origin of a lowered ordered moment. We performed inelastic neutron scattering experiments on TOFTOF at the FRM-II with energy of the incident neutrons $E_i = 2.7, 5.7,$ and 16.9 meV and on PANDA with $E_i = 5.6$ meV at $2.8 < T < 50$ K. We found only one CEF excitation at $\hbar\omega \approx 9.5$ meV at $T = 2$ K in line with previous measurements on SV29 at FRJ-2 with fixed $E_i = 30$ meV. This excitation has been identified with the transition between a Γ_7 doublet and a Γ_8 quartet state. No further inelastic excitations have been observed except for a quasielastic contribution which increases in width with increasing temperature.

TT 20.16 Wed 14:00 Poster A

Kondo effect in low-carrier systems — ●ROBERT HAGER and RALF BULLA — Theoretische Physik III, Elektronische Korrelationen und Magnetismus, Institut für Physik, Universität Augsburg

Recent experiments on dilute U impurities in semiconducting CaB_6 show typical Kondo phenomena with a Kondo temperature $T_K \approx 2$ K (G.A. Wigger *et al.*, Europhys. Lett. **68**, 685 (2004)). This observation is rather unusual for magnetic moments due to $5f$ electrons because of the large hybridization between impurities and the conduction electrons. We perform numerical renormalization group calculations for an Anderson impurity model with a low concentration of conduction electrons, believed to be the relevant model for $(\text{U,Ca})\text{B}_6$. We present results for thermodynamic and dynamic quantities for various carrier concentrations and investigate the crossover from mixed-valent to Kondo behaviour upon decreasing the filling of the conduction band.

TT 20.17 Wed 14:00 Poster A

Strong inhomogeneities and non-Fermi liquids in randomly depleted Kondo lattices — ●MATTHIAS VOJTA¹ and RIBHU KAUL² — ¹Institut für Theoretische Physik, Universität Köln — ²Physics Department, Harvard University

We discuss the low-temperature behavior of Kondo lattices upon random depletion of the local f moments. For a large range of intermediate doping levels, between the coherent Fermi liquid of the dense lattice and the single-impurity Fermi liquid of the dilute limit, we find strongly inhomogeneous states that exhibit distinct non-Fermi liquid characteristics. In particular, the interplay of dopant disorder and strong interactions leads to rare weakly screened moments which dominate the bulk susceptibility. Our results are relevant to compounds like $(\text{Ce,Lu})\text{CoIn}_5$.

TT 20.18 Wed 14:00 Poster A

Unusual Single Ion Behavior in $\text{CeNi}_{8.6}\text{Cu}_{0.4}\text{Ge}_4$ near a Quantum Critical Phase Transition — ●LUDWIG PEYKER¹, ERNST-WILHELM SCHEIDT¹, WOLFGANG SCHERER¹, STEPHAN KEHREIN², and HERWIG MICHOR³ — ¹Chemische Physik und Materialwissenschaften, Universität Augsburg, 86159 Augsburg, Germany — ²Fakultät für Physik, LMU München, 80333 München, Germany — ³Institut für Festkörperphysik, TU Wien, 1040 Wien, Austria