netic reference compound $LuRh_2Si_2$ in the temperature range between 30 mK and room temperature are presented and discussed within the framework of current theoretical models.

The high temperature transport properties are dominated by the transition from incoherent to coherent Kondo scattering and furthermore by the crystal electric field splitting of the Yb^{3+} ions, as the first excited doublet is situated at 200 K. The low temperature regime is governed by the strong NFL behavior due to the proximity of the antiferromagnetic instability.

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Single crystal growth and investigation of the magnetism of the alloy $CePd_{1-x}Rh_x$ for concentrations $x \geq 0.6$ — •M. Deppe[1], P. Pedrazzini[2], N. Caroca-Canales[1], C. Geibel[1], and J.G. Sereni[3] — [1]Max-Planck-Institute for Chemical Physics of Solids, Nöthnitzer Str. 40, 01187 Dresden, Germany — [2]DPMC-Université de Genève, Q. Ernest - Ansermet, 1211 Genève, Switzerland — [3]Lab. Bajas Temperaturas, Centro Atómico Bariloche (CNEA), 8400 S.C. de Bariloche, Argentina

In the orthorhombic alloy $CePd_{1-x}Rh_x$ the continuous decrease of the ferromagnetic ground state $T_C(x)$ can be followed over more than a decade in T, from 6.6 K for $x = 0$ to 0.25 K at $x = 0.8$. Additional low temperature measurements suggest a smeared ferromagnetic quantum-critical point (QCP) for x_{cr} between 0.87 and 0.9.
All these results were based on $CePd_{1-x}Rh_x$ polycrystals. In order to get a more precise insight into the magnetic behaviour in the critical region we grow $CePd_{1-x}Rh_x$ single crystals in the range $x \geq 0.6$. We used the Bridgman technique with a pulling rate of 3-5 mm. Differential thermoanalysis measurements indicate a low melting point $T_m = 1090 \pm 15$ °C. The lattice parameters were defined with X-ray powder diffraction and the composition was investigated with microprobe analysis. We performed specific heat and resistivity measurements down to 0.4 K and compare our results with the previous results on polycrystalline samples. Further we studied the decrease of the magnetic anisotropy with x by susceptibility and magnetization measurements. These results will be discussed in relation to the scenario for the critical concentration.

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Ultra-low-temperature specific heat of $CePd_{1-x}Rh_x$ – smeared ferromagnetic quantum phase transition — •Adam Pikul, Tanja Westerkamp, Robert Kuechler, Nubia Caroca-Canales, Philipp Gegenwart, Julian Sereni, and Christoph Geibel — Max-Planck-Institut für Chemische Physik fester Stoffe, Dresden

The $CePd_{1-x}Rh_x$ system exhibits a continuous evolution from ferromagnetic (FM) order in CePd ($T_C = 6.5$ K) to an intermediate–valence ground state in CeRh [1]. In the present contribution we report on results of low-temperature specific-heat measurements performed for polycrystalline samples of $CePd_{1-x}Rh_x$, with the compositions $0.8 \leq x \leq 0.95$, which are supposed to be close to a FM quantum critical point [1].

In contrast to $CePd_{0.2}Rh_{0.8}$, still demonstrating the FM phase transition at $T_C = 370$ mK, the $C(T)$ curve measured for $CePd_{0.15}Rh_{0.85}$ does not show any anomaly at least down to 70 mK. In the latter compound $C/T \sim -\ln T$, characteristic of a non-Fermi-liquid (NFL) system, and achieves a value of almost 1 J/(mol K^2) at 70 mK. Upon further increasing of the Rh-content the value of C/T decreases, but the NFL behavior is still well visible in the samples with $0.87 \leq x \leq 0.95$, for which $C/T \sim T^{-\alpha}$ ($\alpha \approx 0.5$). Upon applying magnetic fields FL behavior $C/T(T) \sim const.$ is recovered in all different samples.

The above-mentioned results indicate that the NFL behavior is observed down to mK-temperatures over an extended x-range ($0.85 \div 0.95$). This would be compatible with a smeared quantum phase transition.

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Hall effect near the quantum critical point of $CeCu_{6-x}Au_x$ — •M. Röger[1], M. Uhlarz[1], S. Putselyk[1], O. Stockert[2], and H. v. Löhneysen[1,3] — [1]Physikalisches Institut, Universität Karlsruhe (TH), D-76128 Karlsruhe — [2]Max-Planck-Institut für chemische Physik fester Stoffe, D-01187 Dresden — [3]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, D-76021 Karlsruhe

The heavy-fermion system $CeCu_{6-x}Au_x$ orders antiferromagnetically above $x_c = 0.1$. The quantum phase transition at x_c displays unusual features, e.g., low-dimensional spin fluctuations and locally critical slowing down of these spin fluctuations suggestive of a breakdown of the Kondo coupling between $4f$ and conduction electrons [1]. This breakdown should be reflected in the Hall effect [2]. The Hall effect of $CeCu_{6-x}Au_x$ ($0 \leq x \leq 0.2$) as measured in a finite field ($B = 0.3$ T) along the magnetically easy c axis has shown Fermi-liquid behavior at low T, i.e. a temperature-independent Hall constant R_H below ~ 0.3 K [3]. Applying the magnetic field parallel to the magnetically hard b-axis (anisotropy factor ~ 10) allows to detect the effect of magnetic order on R_H for $x = 0.2$ and of quantum criticality for $x = 0.1$.

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Experimental Study of the Hall Effect and Magnetoresistance in MnSi — •Andreas Neubauer, Christian Pfleiderer, Philipp Niklowitz, and Peter Böni — Physik Department E21, Technische Universität München, James-Franck-Strasse, D-85748 Garching, Germany

The itinerant-electron magnet MnSi orders magnetically at $T_c = 29.5$ K. The magnetic state is characterised by a helical modulation along the $\langle 111 \rangle$ space diagonal in the cubic B20 structure. Magnetic field suppresses the helical order above 0.6 T. The properties of MnSi are in various ways remarkable. The temperature dependence of the electrical resistivity suggests the emergences of an extended non-Fermi liquid phase above $p_c = 14.6$ kbar. Neutron scattering at ambient pressure shows an anomalous field dependence of helical fluctuations which may indicate certain similarities with the presence of partial magnetic order akin liquid crystals observed in a pocket of the NFL-phase. Here we report a detailed study of the Hall effect and the magnetoresistance of MnSi. We focus in particular on normal and anomalous contributions to the Hall effect and consider similarities and differences with conventional ferromagnets.

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Magnetocaloric effect and Grüneisen parameter of thespin-gap system $TlCuCl_3$ — •S. Stark[1], N. Johannsen[1], T. Zabel[1], O. Heyer[1], A. Oosawa[2], H. Tanaka[3], A. Vasiliev[4], and T. Lorenz[1] — [1]II. Physikalisches Institut, Universität zuKöln, Germany — [2]Advanced Science Research Center,Japan Atomic Energy Research Institute, Japan — [3]Dep. ofPhysics, Tokyo Institute of Technology, Japan — [4]LowTemp. Physics Dep., Moscow State University, Russia

$TlCuCl_3$ is a S = $\frac{1}{2}$ quantum system with a nonmagnetic singlet ground state and a small energy gap to the excited triplet states. A magnetic field $H > 6$ T induces 3D antiferromagnetic order with a staggered magnetization perpendicular to the applied field. This transition can be described by a Bose-Einstein condensation of magnons and represents an example for a field-induced quantum phase transition. We present a study of the magnetocaloric effect, the thermal expansion α, the specific heat c_p and the magnetostriction. There exist clear predictions for the behavior of these quantities near a quantum critical point [1]. The differential magnetocaloric effect $\theta = \frac{dT}{dB}$ and the Grüneisen parameter $\Gamma = \frac{\alpha}{c_p}$ are very convenient to determine a possible quantum critical behavior of $TlCuCl_3$, since one anticipates that both Γ and $\frac{\theta}{T}$ diverge ($\sim \frac{1}{T}$) for T $\rightarrow$ 0 and B $\rightarrow B_c$. Using Ehrenfest relations we also derive the uniaxial pressure dependence of the phase boundary [2]. We performed our measurements down to 0.3 K and compare our results to the existing theory.

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Bulk and Surface Photoemission in Ytterbium Compounds — •Stefan W. Schmidt[1], Friedrich Reinert[2], and Stefan Hüfner[1] — [1]Universität des Saarlandes, 7.2 Experimentalphysik, D-66041 Saarbrücken, Germany — [2]Universität Würzburg, Experimentelle Physik II, D-97084 Würzburg, Germany

We have investigated a broad range of intermetallic intermediate-valent Yb compounds with high-resolution UPS. The results lead to interesting correlations between the binding energy ε_0 and the linewidth Γ_0 of the near-E_F spectroscopic structure and the ytterbium valence υ_{Yb} in these systems, and we discuss the influence of crystal field effects to the interpretation of our data.

From an investigation of the first order valence phase transition observed in the $4f$- and $4d$-XPS data of the prototypical compound $YbInCu_4$ [1] and a comparison to existing PE data [2,3], we conclude that a surface-near region of thickness $d \approx$ 20–40 Å with different