Talk 24: 14:00–

High-field ESR spectroscopy of the heavy-fermion system $YbRh_2Si_2$

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$YbRh_2Si_2$ is a Kondo–system with a Kondo temperature $T_K \sim 25\,\mathrm{K}$ [1]. It is located very close to a quantum critical point related to a very weak antiferromagnetic order below $T_N = 65\,\mathrm{mK}$ and a critical magnetic field of $B_C = 0.06\,\mathrm{T}$ at ambient pressure. Surprisingly an ESR signal typical of a local Yb^{3+} spin has been observed below T_K at fields $B \leq 0.7\,\mathrm{T}$ [2]. The occurrence of the ESR signal is unexpected because at $T \ll T_K$ the Yb^{3+} moments should be screened. In order to obtain a deeper insight in this unusual behavior we have performed ESR measurements on single crystals of $YbRh_2Si_2$ at much higher fields (1.8 to 7.5 T) at temperatures from 1.8 to 30 K, i.e. in the region where one expects a crossover from a Non–Fermi liquid(NFL) to a Fermi–liquid (FL) phase [3]. We observe a strongly anisotropic signal which can be assigned to Yb^{3+} moments. The signal exhibits a pronounced dependence on temperature and the magnetic field. We discuss the puzzling controversy between the observation of ESR which shows properties characteristic of a local Yb^{3+} moment and the Kondo state of $YbRh_2Si_2$.

References

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