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Hall effect and magnetoresistance at the quantum critical point in $YbRh_2Si_2$ — •Sven Friedemann[1], Niels Oeschler[1], Cornelius Krellner[1], Christoph Geibel[1], Silke Paschen[1,2], and Frank Steglich[1] — [1]Max Planck Institute for Chemical Physics of Solids, Noethnitzer Strasse 40, 01187 Dresden, Germany — [2]Vienna University of Technology, Karlsplatz 13, 1040 Wien, Austria

The heavy-fermion metal $YbRh_2Si_2$ exhibits pronounced non-Fermi liquid (NFL) behavior due to its vicinity to a quantum critical point (QCP). By applying small magnetic fields, $YbRh_2Si_2$ is driven from an antiferromagnetic state through the QCP towards the paramagnetic state. The field-dependent Hall effect as a measure of the Fermi volume is assumed to be the appropriate method to characterize the QCP in $YbRh_2Si_2$. As an extension to previous results [1] we present low temperature Hall-effect data of new high-quality samples which confirm a step in R_H for $T \to 0$. This finding is in contrast to the spin-density-wave behavior and supports the local scenario recently proposed by Si et al. [2]. The T dependence of the height and the width of the crossover are discussed. Corresponding features are also observed in the magnetoresistance.

([1] S. Paschen et al., Nature 432, 881 (2004)) ([2] Q. Si et al., Nature 413, 804 (2001))

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