

High Pressure Resistivity Measurements on the Heavy Fermion System CeAl₂

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An investigation on the heavy fermion system CeAl₂ is presented at high pressures and low temperatures (down to 20 mK). CeAl₂ is a well known heavy fermion compound which orders antiferromagnetically at low temperature. At ambient pressure it is antiferromagnetic below 3.8K, with antiferromagnetism thought to be due to the formation of a spin density wave (SDW).

Performing low noise four terminal resistivity measurements in a Diamond Anvil Cell we observe changes in CeAl₂ as the antiferromagnetism is suppressed until it reaches a quantum critical point at a critical pressure of 3.2GPa.

The conventional Fermi Liquid theory of matter at low temperatures has been observed to break down in previous measurements performed on CeAl₂ around the critical pressure¹. The nature of these deviations including a peak in the residual resistivity and the nature of the temperature dependence of the resistivity at the critical pressure are unclear. In our measurements we have performed a detailed study on higher quality samples around the quantum critical point to further investigate this unusual behaviour.

¹H. Miyagawa, G. Oomi, M. Ohashi, I. Satoh, T. Komatsubara, M. Hedo, and Y. Uwatoko. Physical Review B, **78**, August 2008.