How does the heavy electron decay at a quantum critical point?

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A series of new experiments on quantum critical points[1] begin to give us new insight into way the Fermi liquid evolves into a quantum critical point, and the nature of the break-up of the heavy electron quasiparticle at the quantum critical point. This talk will discuss how the recent observation of the constancy of the Kadawaki Woods[1] ratio in the field-tuned approach to a QCP indicates that the underlying scattering amplitudes are renormalized in energy, but contain no strong momentum dependence. This discovery definitively rules out a spin density wave scenario for the heavy fermion QCP. The talk will will discuss scenarios where a complete break-up of the heavy electron quasiparticle leads to a jump in the Hall constant at the heavy electron quantum critical point, and will outline the constraints this places on a future theory of this phenomenon.

References

[1] J. Custers, P. Gegenwart et al. , to be published.

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