

# Coherence and Fermi surface topology in models of heavy fermions.

F. F. Assaad

*Institut für Theoretische Physik und Astrophysik, Universität Würzburg, Am Hubland, D-97074  
Würzburg, Germany*

Below the coherence temperature, the paramagnetic state of heavy fermion systems is characterized by a large Fermi surface accounting for both the conduction electrons as well as the impurity spins. In this talk, we will present recent results aimed at understanding the evolution and breakdown of this Fermi surface when competing interactions are included. In particular we will concentrate on i) the magnetic order-disorder transition triggered by the competition between the RKKY interaction and Kondo screening [1] ii) the inclusion of a magnetic field [2] and iii) coupling to phonon degrees of freedom [3,4]. Our results are based on cluster DMFT calculations for the Kondo lattice and periodic Anderson models.

[1] L.C. Martin and F.F. Assaad, Phys. Rev. Lett. **101**, 066404 (2008)

[2] K. S. D. Beach and F.F. Assaad, Phys. Rev. B **77**, 205123 (2008)

[3] M. Raczkowski, P. Zhang, F. F. Assaad, T. Pruschke and M. Jarrell, preprint

[4] F. F. Assaad and T. Lang, Phys. Rev. B **76**, 035116 (2007).