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Crossover from non-Fermi liquid to Fermi liquid behavior: Amplitude of de Haas-van Alphen oscillations[1] PEDRO SCHLOTTMANN, Florida State University — Deviations from Landau's Fermi liquid behavior in numerous U, Ce and Yb based heavy fermion systems are known as non-Fermi liquid behavior and are frequently attributed to a quantum critical point (QCP). A nested Fermi surface together with the remaining interaction between carriers after the heavy bands are formed may give rise to itinerant antiferromagnetism. We consider an electron pocket and a hole pocket, with Fermi momenta k_{F1} and k_{F2}, respectively. The order can be suppressed by increasing the mismatch of the Fermi momenta and a QCP is obtained as $T_N \to 0$. For the tuned QCP the specific heat over T increases as the logarithm of the temperature as T is lowered [1] and the linewidth of the quasi-particles is linear in T and ω. [2] With increasing nesting mismatch and decreasing temperature the specific heat and the linewidth display a crossover from non-Fermi liquid ($\sim T$) to Fermi liquid ($\sim T^2$) behavior. [2] Using the quasi-particle linewidth the temperature dependence of the amplitude of the de Haas-van Alphen oscillations (corresponding to the pocket frequencies) is computed.
[1] P. Schlottmann, Phys. Rev. B **68**, 125105 (2003).
[2] P. Schlottmann, Phys. Rev. B **73**, 085110 (2006).

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Pedro Schlottmann
Florida State University

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