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Dephasing by Kondo impurities

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We calculate the dephasing rate due to magnetic impurities in a weakly disordered metal as measured in a weak localization experiment. If the density n_S of magnetic impurities is sufficiently low and the (non-magnetic) disorder sufficiently small, the dephasing rate $1/\tau_\varphi$ is a universal function, $1/\tau_\varphi = (n_S/\nu) f(T/T_K)$, where T_K is the Kondo temperature and ν the density of states. We show that inelastic vertex corrections with a typical energy transfer ΔE are suppressed by powers of $1/(\tau_\varphi \Delta E) \propto n_S$. Therefore the dephasing rate can be calculated from the *inelastic cross section* proportional to $\pi\nu$ Im $T - |\pi\nu T|^2$, where T is the T-matrix which is evaluated numerically exactly using the numerical renormalization group.

Keywords : dephasing, Kondo, disorder