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Energy-resolved inelastic electron scattering off magnetic impurities MARKUS GARST, LEONID GLAZMAN, Theoretical Physics Institute, University of Minnesota, PETER WÖLFLE, Institut für Theorie der Kondensierten Materie, Universität Karlsruhe — We study inelastic scattering of energetic electrons off a Kondo impurity. If the energy E of the incoming electron (measured from the Fermi level) exceeds the Kondo temperature T_K significantly then the differential inelastic cross-section $\sigma(E,\omega) \equiv d\sigma(E)/d\omega$, characterising scattering of an electron with a given energy transfer ω, is well-defined. We show that $\sigma(E,\omega)$ factorizes into two parts dependent on E and ω, respectively. The E–dependence is logarithmically weak and is due to the Kondo renormalization of the effective coupling. We are able to relate the ω–dependent factor to the spin-spin correlation function of the magnetic impurity. Using this relation, we find two different regimes in the σ *vs.* ω dependence: the cross-section grows as $\sigma \propto \omega$ at $\omega \ll T_K$, and upon reaching a maximum at $\omega \sim T_K$, starts falling off as $\sigma \propto [\omega \ln^2(\omega/T_K)]^{-1}$. At finite temperature the "scattering gap" for small ω is filled and only a broad peak at zero energy transfer remains for $T > T_K$. We also find $\sigma(E,\omega)$ in the presence of a magnetic field. The differential inelastic scattering cross section determines the relaxation of hot electrons injected in a metal with magnetic impurities.

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