Energy-Resolved Inelastic Electron Scattering off a Magnetic Impurity

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We investigate the loss of energy by an electron scattered off a magnetic impurity in a metal. If the initial electron energy E (measured from the Fermi level) is high compared to the Kondo temperature, then the scattering is predominantly inelastic. However, the characteristic energy loss in the scattering event is of the order of the Kondo energy scale (i.e., small compared to E). We find the full energy dependence of the corresponding scattering cross-section by relating it to the dissipative part of susceptibility of the magnetic impurity. Effects of a magnetic field and temperature on the energy-resolved scattering cross-section are fully characterized. This cross-section may be extracted from experiments with hot electrons in nanowires and quantum dots.