

# RKKY INTERACTION IN THE PRESENCE OF AN EXTERNAL MAGNETIC FIELD

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The Ruderman-Kittel-Kasuya-Yosida (RKKY) interaction has been extended for the case when the external magnetic field is taken into account. It has been shown that the RKKY hamiltonian should contain the Zeeman-like term in which the effective giromagnetic factor,  $g^{eff}$ , occurs. This  $g^{eff}$  factor contains, in addition to the usual giromagnetic factor connected with the localized spins,  $g_S$ , the correction term, which is linearly dependent on the contact potential,  $A$ , of the localized spin with the conduction electrons. The origin of this additional correction has been explained by the polarizing effect exerted by the external magnetic field on the electronic gas. Depending on the strength and sign of the contact potential  $A$ , the  $g^{eff}$  factor can be increased or decreased with respect to  $g_S$ , which gives a possibility for experimental study of the sign of the contact potential with the help of external field. As we know, in the conventional RKKY exchange interaction without the field, the information about the sign of the contact potential is hidden due to the quadratic relationship,  $J^{RKKY} \propto A^2$ , and hence this sign remains unknown. The numerical estimations indicate that the correction term in  $g^{eff}$  can be recognizable in some materials, for instance for Co embeded in Cu.

9.7 cm

13.4 cm

## Subject category :

6. Theory of Magnetism

## Presentation mode :

poster

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