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Using the sf-model to describe spintronic devices

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Crystals containing rare earth atoms are interesting candidates for spintronic devices due to the fact that magnetism and the electric current are caused by different electron groups. The exactly solvable zero band-width limit of the sf-model is used to calculate the conduction electron spin polarization P(T,n), the chemical potential $\mu(T, n)$ and the 4f-magnetization m(T,n). The results confirm the existence of spin dependent electron transport properties in these materials. As an application to 4f-antiferromagnetism the alloy series $CeNi_{1-x}Co_xGe_2$ is investigated. It is shown that the susceptibility X(T) displays a peak at the Neel temperature T_N thereby indicating a transition into the paramagnetic phase. A numerical evaluation yields results in qualitative agreement with those of other authors.

Apply to be considered for a student ; award (Yes / No)?

No

Level for award;(Hons, MSc, PhD, N/A)?

N/A

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