

## RKKY-reminiscent interaction in a "net fractal systems"

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Within the RKKY model the effective, magnetic interaction arises due scattering of the uniformly distributed electrons on the magnetic moments of the impurity ions. This picture is valid provided that the dopant ions are randomly distributed within a metallic-like matrix. However, in many cases the dopant magnetic ions show tendency towards clustering. These spontaneously patterned structures can be assembled in various geometries. The resulting clusters immersed within the matrix often show fractal symmetry. In this case the restrictive assumption of an isotropic surrounding that validates the RKKY model doesn't hold. That's why different concepts that account the effect of reduced geometry on magnetic interactions are still under debate. In our contribution, with the use of logarithmic coordinates, we show that in "net fractals", a specific class of fractals [1], the indirect exchange mediated by itinerant electrons can be presented in the form that is reminiscent of the RKKY interaction in a system of fractional spectral dimensionality [2]. Finally, we prove that in spite of reduced geometry the long range magnetic order is possible.

[1] Z. Bak, Phase Transitions **80**, 79 (2007).

[2] Z. Bak, R. Jaroszewicz, W. Gruhn: J. Mag. Mag. Mater. **213**, 340 (2000).

9.7 cm

13.4 cm

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