

Electron paramagnetic resonance linewidth in a two-dimensional heisenberg antiferromagnet ($S = 1/2$) with skyrmeons

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Abstract

Electron magnetic relaxation was studied in a two-dimensional Heisenberg antiferromagnet ($S = 1/2$) with skyrmeons. The electron paramagnetic resonance (EPR) linewidth (Γ_{\perp}) was calculated at temperatures $T \leq J$ (J is the nearest-neighbor interaction constant). The magnitude of Γ_{\perp} caused by the Dzyaloshinskii-Moriya interaction is shown to grow as r_0/a with decreasing temperature, whereas the anisotropic symmetric interaction leads to the $(r_0/a)^3$ dependence, where r_0 is the average size of a skyrmeon and a is the lattice parameter. The results obtained agree qualitatively with calculations performed on the basis of a renormalization-group (RG) analysis of the nonlinear σ model at $T \ll J$. © 2000 MAIK "Nauka/Interperiodica".
