

## **Anisotropic exchange interactions in CuGeO<sub>3</sub> probed by electron spin resonance spectroscopy**

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### **Abstract**

The analysis of the anisotropy of the electron-spin resonance (ESR) linewidth in CuGeO<sub>3</sub> taken at different temperatures, allows one to obtain relations between the anisotropic exchange-interaction parameters. The anisotropy of the ESR linewidth can be understood purely in terms of the symmetric anisotropic exchange interaction. The intrinsic anisotropic exchange parameters of the copper spins are determined for intrachain and interchain interactions and their microscopic origin is explained. All conclusions about the nature of the anisotropy are in agreement with the reported crystal structure for CuGeO<sub>3</sub>. The temperature dependence of the anisotropic exchange parameters can be related to the lattice fluctuations as detected by other experimental techniques. An empirical formula for the temperature dependence of the ESR linewidth is suggested.

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