

## Unconventional anisotropic superexchange in $\alpha'$ -NaV<sub>2</sub>O<sub>5</sub>

Eremin M., Zakharov D., Eremina R., Deisenhofer J., Krug Von Nidda H., Obermeier G., Horn S., Loidl A.

*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

---

### Abstract

The strong line broadening observed in electron spin resonance on NaV<sub>2</sub>O<sub>5</sub> is found to originate from an unusual type of the symmetric anisotropic exchange interaction with simultaneous spin-orbit coupling on both sites. The microscopically derived anisotropic exchange constant is almost 2 orders of magnitude larger than the one obtained from conventional estimations. Based on this result we systematically evaluate the anisotropy of the ESR linewidth in terms of the symmetric anisotropic exchange only, and we find microscopic evidence for precursor effects of the charge ordering already below 150 K. © 2006 The American Physical Society.

<http://dx.doi.org/10.1103/PhysRevLett.96.027209>

---