NMR study of ⁸⁹Y and ¹³⁹La in perovskite Ti oxides

A. Najev¹, S. Hameed², D. Pelc^{1,2}, M. Greven², M. Požek¹

¹ Department of Physics, Faculty of Science, University of Zagreb

² School of Physics and Astronomy, University of Minnesota, Minneapolis

Trivalent rare-earth titanates RTiO₃



Nuclear Magnetic Resonance on single crystals $B_0 \parallel C$

NMR probes local magnetic and electric fields surrounding the nucleus by exciting its spin and measuring its relaxation.

What is measured?

Spectra reflect local static magnetic fields. If the nuclear spin is lager than ½, the quadrupolar contribution could give insight into local electric fields.

Time relaxations give information on dynamic susceptibilities and exchange dynamics.



 $\left(\frac{\gamma^2 k_B}{2\mu_B^2}\right) \sum \frac{A_q \, Im \, \chi(q, \omega)}{\omega}$ $\frac{1}{T_1T} = \left(\frac{1}{2}\right)$

- - T₁ (spin-lattice or longitudinal relaxation) describes the return of spin into equilibrium in the direction of external magnetic field.
 - T₂ (spin-spin or transverse relaxation) measures the decay of magnetization perpendicular to the external magnetic field and is influenced by field inhomogeneity.

- c-axis oriented parallel external field 11.85 T
- T_c=8.5 K, c-axis oriented parallel external field 11.3 T and 9 T

