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# Nuclear magnetic relaxation in rare-earth compound crystals due to fluctuations of hyperfine magnetic fields

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## Abstract

Some results on NMR and relaxation studies of the Van Vleck paramagnet TmES (thulium ethylsulphate) and the Ising ferromagnet DyES are summarized. Complicated but regular quasistatic internal magnetic fields are created by Tm and Dy ions in these compounds. These fields fluctuate due to the thermal excitation of tne ions and the energy transfer from one ion to another. Fluctuations give rise to NMR line shifts, broadening of the lines and spin-lattice relaxation, the shifts, linewidth and spin-lattice relaxation rate being proportional to exp(-Δ/kT) at low temperatures (kT≪Δ, Δ is an excitation energy). Pre-exponential factors depend on fluctuating fields in a definite but complicated manner, so estimates of the correlation time (electron spin-spin relaxation time) can be obtained from measurements of nuclear relaxation rates. 

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