SIMULTANEOUS EFFECTS OF POLARIZATION TRANSFER AND RELAXATION

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Modeling and describing the evolution of complex systems, containing various kinds of mutually coupled spins is essential for making use of rich sources of dynamic and structural information hidden in experimental data obtained by field cycling experiments. This lecture comprises a series of examples illustrating relevant aspects of the complex evolution of multi-spin systems. I shall discuss effects of quadrupole interactions and quadrupole spin relaxation on the behavior of neighboring dipolar spins. The discussion includes polarization transfer effects, field dependent relaxation processes of dipolar as well as quadrupole spins and combined results of both of them. I shall point out and comment different physical pictures of the spin evolution, depending on relative strengths of the spin interactions and motional conditions. Motional regimes required for spins to be involved in essentially different evolution pathways like polarization transfers or relaxation are illustrated by experimental examples.

3. D. Kruk, O. Lips, Field dependent nuclear relaxation of spins $\frac{1}{2}$ induced by dipole-dipole couplings to quadrupole spins: LaF$_3$ crystals as an example, J. Magn. Reson. – in press