

Inverting the time in spin diffusion processes:
Theory and applications

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Time reversal in spin-diffusion processes: Theory and Applications.

In a system of dipolar interacting spins, a local magnetization is created, by means of the NMR tool. We studied:

- how this local magnetization "diffuses" in the sample, because of the dipolar interaction processes;
- how this magnetization can be refocalized, inverting the sign of the dipolar hamiltonian, which is equivalent to invert the time !

This studies could:

- lead to a new analysis method for the structure and movements of molecules;
- be an interesting experimental support for the understanding of stochastic processes in many-body quantum interacting systems.

Note to the lector:

The solid-NMR-specialist might be able to dive into the following without get drowned. But for security reasons, it is strongly advised to have first a quick look at appendix 0: "an introduction to NMR and spin dynamics", and in particular the part "Relaxation processes".

It is not a hard job and introduces with all a set of characteristic words and concepts that might help the understanding.

Good luck !

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