

# Spin Diffusion in Pure Multiple-Pulse NQR

G. B. Furman, S. D. Goren, A. M. Panich, and A. I. Shames

Department of Physics, Ben-Gurion University of the Negev, 84105 Be'er-Sheva, Israel

Reprint requests to Dr. G. B. F.; Fax: +917-7-647-29-03; E-mail: gregoryf@bgumail.bgu.ac.il

Z. Naturforsch. **55 a**, 54–60 (2000); received August 25, 1999

*Presented at the XVth International Symposium on Nuclear Quadrupole Interactions, Leipzig, Germany, July 25 - 30, 1999.*

We present a detailed theoretical and experimental NQR multiple-pulse spin-locking study of spin-lattice relaxation and spin diffusion processes in the presence of paramagnetic impurities in solids. The obtained diffusion equation allows to find the time dependence of the magnetization in the effective field. The spin lattice relaxation times were calculated, both for direct and diffusion regimes, as functions of the correlation time and multiple-pulse parameters. Measurements of relaxation times in rotating frame allow to determine the diffusion coefficient and the radius of the diffusion barrier in  $\gamma$ -irradiated polycrystalline samples of NaClO.

*Key words:* NQR; Paramagnetic Impurities; Spin Diffusion.