

# Dynamic Polarization and Relaxation of $^{75}\text{As}$ Nuclei in Silicon at High Magnetic Field and Low Temperature

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## Abstract

© 2017, Springer-Verlag Wien. We present the results of experiments on dynamic nuclear polarization and relaxation of  $^{75}\text{As}$  in silicon crystals. Experiments are performed in strong magnetic fields of 4.6 T and temperatures below 1 K. At these conditions donor electron spins are fully polarized, and the allowed and forbidden electron spin resonance transitions are well resolved. We demonstrate effective nuclear polarization of  $^{75}\text{As}$  nuclei via the Overhauser effect on the time scale of several hundred seconds. Excitation of the forbidden transitions leads to a polarization through the solid effect. The relaxation rate of donor nuclei has strong temperature dependence characteristic of Orbach process.

<http://dx.doi.org/10.1007/s00723-017-0875-z>

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