

TRR Guest Scientist Lecture / Seminar

Date/Time: Thursday, 25.10.2018 / 12:15 Uhr
Location: TU Dortmund University, Otto-Hahn-Str. 4
Room P1-02-110

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Low temperature nuclear spin-lattice relaxation in n-GaAs

Abstract:

In this presentation main focus will be on a progress made in studying the nuclear-spin lattice relaxation in n-type GaAs bulk and microstructure samples with different electron concentrations. All results are obtained using a method based on the optical orientation technique. It will be revealed that in both insulating, where electrons are localised, and metallic phase, where electrons are free and mobile, nuclear spin relaxation is strongly enhanced at low magnetic fields. The origin of this effect could reside in the quadrupole interaction between nuclei and fluctuating electron charges, that has been proposed to govern nuclear spin dynamics at low magnetic fields. With an increase in the magnetic field, nuclear spin relaxation becomes suppressed and it is confirmed that at stronger magnetic fields the main relaxation channel is diffusion limited hyperfine interaction for dielectric samples and hyperfine scattering of itinerant electrons (Korringa mechanism) for metallic sample.

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