Experimental magnetodynamics/quantum transport

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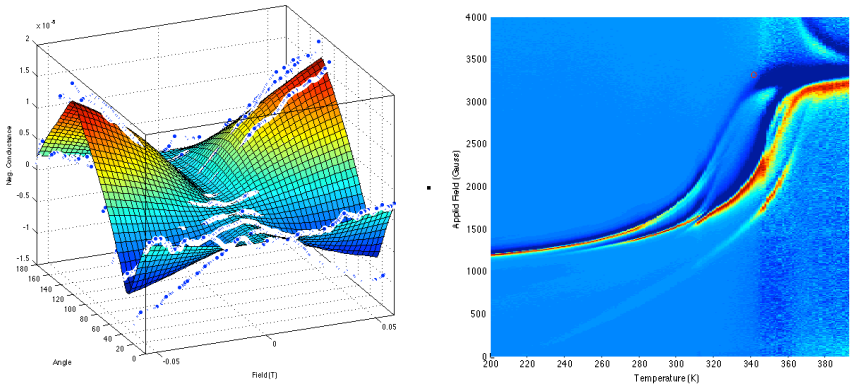
A short introduction:

The research of the experimental magnetodynamics/quantum transport group is focused on understanding the interplay between magnetisation, spin and charge currents at the nanoscale. We utilize ferromagnetic resonance (FMR) spectroscopy to understand how material, structure and charge/spin currents between different materials affect the magnetodynamic properties. We also utilize point contact spectroscopy for energy dependent studies of quantum interference effects such as weak localisation, weak anti localisation and universal conductance fluctuations (quantum transport properties).



Examples of research: Left: magnetoconductance of a point contact to graphite as function of angle, Right: Changes in the FMR induced adsorption of a magnonic film with change of perturbing potential (which scales with temperature)

Master/Project Assignments:

There is a possibility to make any assignment within the fields described (and other ones), please come in and discuss!

Examples of assignments are:

- **Point contact spectroscopy:** magnetoconductance of materials is used to understand energy dependence of scattering, coherence lengths and other iportsnat parameters of layered materials.
- **Magnonic structures**: The magnetodynamic response of a magnetic material can be tuned by control of the magnetic structure, where periodic variations will create magnonic materials. This assignment involves experimental studies of such materials in combination with either synthesis (thin film growth and structuring), or theoretical predictions.
- **Generation and detection of magnetodynamic waves**: Ferromagnetic thin films may be used to carry magnetodynamic waves, in this assignment you will generate and detects such waves and use them to characterise the fundamental transport properties of such waves.
- **Spin pumping at interfaces**: Most interaction in active spintronic devices is made through interaction of a spin current with an interface/material. In this assignment you use a thin ferromagnetic film to induce spin currents to map out the interaction with other thin films, such as ferromagnets, antiferromagnets or superconductors.
- **Instrument building**: The group is constantly designing and developing custom built instrumentation, mainly within two different lines of research: 1) STM:s for point contact spectroscopy at low temperatures and high magnetic fields . 2) High frequency instrumentation for evaluation of magnetodynamics.