Seminar talk, Martin Borchart (Master student at FHI)

February 1st, at 9 a.m. in Seminar room B, R. 2.6

Magnetorestive Effects at THz Frequencies

Conventional electronics is based on the charge of electrons, while spintronics additionally considers the spin degree of freedom. We will discuss the three elementary operations: transport, manipulation and detection of spin-polarised electrons. Recently, there has been a paradigm change from exploring and utilizing classical spintronic effects to relativistic spintronic effects such as Spin-Orbit-Coupling (SOC). The Anisotropic Magnetoresistance (AMR) effect is a prominent member of this category, and the main focus of this talk.

We aim to push spintronics, in particular the AMR to the terahertz range and determine whether or not there is a frequency dependence. These magnetoresistive effects are probed in THz radiation transmission experiments with light from femtosecond laser driven table-top THz radiation sources.

So far, a working method to measure even and odd magnetoresistive effects in the range between 0.2 and 30 THz, in particular AMR, has been established. We present our current state of research in which we show a frequency independent AMR for thin-film permalloy in the range from 0.2 to 2 THz, quantitatively identical to corresponding DC AMR values.