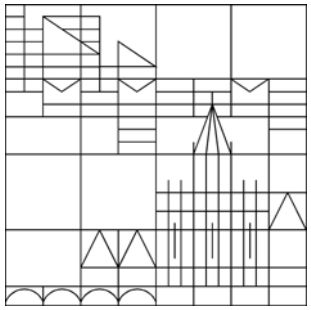

Universität Konstanz

Fachbereich Physik

ANTRITTSVORLESUNG

Montag, den 06. Juli 2009, 17:15 Uhr, R 513

Vortragender: **PD Dr. Mathias Kläui**

Institut: Universität Konstanz, ERC Research Group Nanomagnetism, FB Physik

Thema:

Spin currents in magnetic nanostructures - high resolution imaging and transport

When combining transport with magnetic materials on the nanoscale, a range of exciting and novel phenomena emerge. It was found that the magnetization configuration influences strongly the transport due to spin-dependent scattering in ferromagnets (e.g. domain wall magnetoresistance).

Conversely the reciprocal effect of the spin polarized currents on the magnetization also exists. This “spin transfer torque” effect leads to current-induced domain wall motion, which has become the focus of intense research in the last few years due to a strong interest in the fundamental interaction between spin – polarized currents and the magnetization in ferromagnets.

Furthermore for applications, it has recently become possible to replace the conventional field-induced reversal by current-induced switching, which exhibits are more favourable scaling behaviour with decreasing lateral dimensions. It has become possible to engineer the domain wall spin structure in device, which then allows controlled switching by wall displacement opening up a novel avenue towards storage, logic and sensing devices.

While the field of current-induced domain wall motion (CIDM), where due to a spin torque effect, electrons transfer angular momentum and thereby push a domain wall is now well established, we have recently started to take the next step, that is use pure diffusive spin currents with no associated net charge currents.

Within a project funded by the European Research Council Starting Independent Researcher Grant we separate spin and charge currents and generate pure diffusive spin currents by spin injection. These show a surprisingly strong interaction with the magnetization when absorbed by a ferromagnet, which opens a novel avenue to ultra-low power dissipation switching. Using the recently acquired Scanning Electron Microscope with Polarization Analysis, we can carry out high resolution imaging of the magnetization and spin accumulation, which will then serve to quantitatively determine the spin currents.

Ab 16:45 Uhr, findet ein kleiner Empfang vor dem Hörsaal statt.

Der Fachbereichssprecher