WWU MÜNSTER

FACHBEREICH PHYSIK

›Allgemeines Physikalisches Kolloquium

> Donnerstag, 16.05.2019 um 16 Uhr c.t.

Dr. Vladislav Demidov

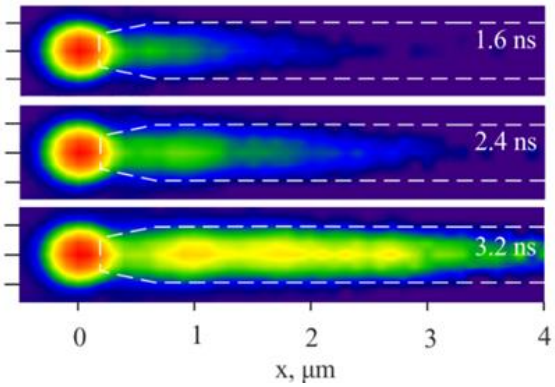
Westfälische Wilhelms-Universität Münster

Pure spin currents for nano-magnoics

Magnonics explores the mechanisms enabling nanoscale transmission and processing of information by using waves of magnetization – spin waves and their quanta – magnons. The unique controllability of spin wave characteristics by the magnetic field allows one to efficiently tune their phase, wavelength, and the propagation path, while the possibility to achieve nanometer wavelength at microwave frequencies makes these waves attractive for the implementation of nanoscale devices.

The recent advent of pure spin currents – flows of angular momentum (spin) not accompanied by the electric currents – have opened new horizons for the field of magnonics. Utilization of pure spin currents enables reversal of the relaxation of the angular momentum and allows one to utilize the sample lattice, which normally plays the role of the angular momentum sink, as its source. This provides a unique possibility to compensate the natural damping in the spin-system of conductive and insulating magnetic materials and enables development of essentially novel magnetic nanodevices for magnonic applications.

In this talk, I review our recent experimental studies of interaction of pure spin currents with magnetic oscillation and waves using micro-focus Brillouin light scattering spectroscopy, which allows the direct visualization of spin-wave propagation with the submicrometer spatial resolution. I demonstrate practical routes for the control of the magnetic relaxation and excitation of coherent magnetization auto-oscillations and propagating spin waves by pure spin currents.



[1] V. E. Demidov, et al., Nat. Commun. 7, 10446 (2016).
[2] M. Evelt, et al., Appl. Phys. Lett. 108, 172406 (2016).
[3] V. E. Demidov, et al., Phys. Rep. 673, 1 (2017).
[4] B. Divinskiy, et al., Adv. Mater. 30, 1802837 (2018).
[5] M. Evelt, et al., Phys. Rev. Appl. 10, 041002 (2018).

Kolloquiums-Kaffee
ab 16 Uhr vor dem Hörsaal

Wilhelm-Klemm-Straße 10
Institutsgruppe 1 Hörsaal HS 2

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