which is induced by the external magnetic field.

Low temperature measurements of the frequency-shift, damping and static deflection of the cantilever in a variable external magnetic field are used to access the horizontal and vertical components of the magnetic moment of the tip. Amplitude and orientation of the magnetic moment is calculated quantitatively based on the analytic model of a harmonic oscillator.

The new characterisation technique is applied on hard- and soft-magnetic cantilevers, i.e. a whisker- type and a Co-coated MFM tip.

[1] T. Mizoguchi, Jpn. J. Appl.Phys. 43 (2004) 4610.

MA 33.47 Fri 11:00 Poster B1

Conical magnetic structure in the kagome-related Swedenborgite CaBaFe4O7 — •Navid Qureshi, Martin Valldor, and Markus Braden — II. Physikalisches Institut, Universität zu Köln, Zülpicher Straße 77, 50937 Köln

Recently, a new type of metal oxides with magnetic kagome substructure was discovered, being closely related to the Swedenborgite mineral. Valldor et al. were able to synthesise the structural homologue YBaCo4O7 [1] and the spin-spin correlation proved to be strong and antiferromagnetic, which immediately raised the question about geometrical frustration in the magnetic Co substructure. Late last year, a new Swedenborgite homologue only containing Fe has been discovered: CaBaFe4O7 [2]. Macroscopic measurements showed that this compound undergoes a magnetic transition at 270 K into a ferrimagnetic state and a spin reorientation at 200 K into a multi-k structure, which could be confirmed by our neutron single crystal diffraction experiment. The temperature dependent investigation of the magnetic reflections (h k 0), (0 0 l) and (h+d k l) yielded first conclusions concerning the magnetic structures. At Tc the Fe magnetic moments order along the c axis with a small component within the a-b plane which does not break translation symmetry. Rietveld analysis shows that the c-component of the moments alternate between the Fe layers. Below 200 K the a-b component becomes modulated by k=(1/3 0 0) resulting in an interesting conical magnetic structure.

[1] Valldor et al., Solid State Sci. 2002, 4, 923 [2] Raveau et al., Chem. Mater. 2008, 20, 6295

MA 33.48 Fri 11:00 Poster B1

Structural and magnetic chirality of the transition metal silicides $Fe_{1-x}Co_xSi$ and $Mn_{1-x}Fe_xSi$ — •Dirk Menzel[1], Vadim Dyadkin[2], Sergey Grigoriev[2], Dmitry Chernishov[3], Vladimir Dmitriev[3], Evgeny Moskvin[2], Daniel Lamago[4], Thomas Wolf[5], Joachim Schoenes[1], Sergey Maleyev[2], and Helmut Eckerlebe[6] — [1]Institut für Physik der Kondensierten Materie, TU Braunschweig, Germany — [2]Petersburg Nuclear Physics Institute, Gatchina, Russia — [3]Swiss-Norwegian Beamline, ESRF Grenoble, France — [4]Laboratoire Léon Brillouin, Saclay, France — [5]Institut für Festkörperphysik, KIT Karlsruhe, Germany — [6]GKSS Forschungszentrum, Geesthacht, Germany

The crystallographic structure and the spin helix chirality of $Fe_{1-x}Co_xSi$ ($0.1 \le x \le 0.5$) and $Mn_{1-x}Fe_xSi$ ($0.06 \le x \le 0.29$) single crystals were determined by X-ray diffraction using synchrotron radiation and polarized neutron small angle diffraction, respectively. A close relationship between the crystalline and the magnetic structures is observed: A left-handed structural configuration found in $Fe_{1-x}Co_xSi$ corresponds to a right-handed magnetic helix and, vice versa, a right-handed structural helix reveals a left-handed spin helix. On the contrary, in $Mn_{1-x}Fe_xSi$ a left (right) handedness of the atomic structure coexists with a left (right) handedness of the spin helix. The origin of the complementary behavior is the sign of the Dzyaloshinsky-Moriya interaction which for a left-handed crystallographic configuration is positive in the $Fe_{1-x}Co_xSi$ system and negative in the $Mn_{1-x}Fe_xSi$ compound.

MA 33.49 Fri 11:00 Poster B1

Spin-waves decay in a helicoidal magnetic. — •Dmitri Efremov and Giniyat Khaliullin — MPIFKF, Stuttgart

We investigate Heisenberg magnetic with ferromagnetic nearest J_1, and antiferromagnetic next-nearest J_2 and next-next-next nearest J_4 spin interactions. We show that the phase diagram consists on several phases: ferromagnetic, Neel antiferromagnetic, A-, helicoidal phases. We argue that spin waves in the helicoidal phase near to a transition point are highly damped. We compare the obtained results with the experiments on inelastic neutron scattering study of iron perovskite oxides such as $CaFeO_3$.

MA 33.50 Fri 11:00 Poster B1

The S=1/2 Heisenberg model on the 2D orthorhombic lattice: A numerical study — •Mohammad Siahatgar, Burkhard Schmidt, and Peter Thalmeier — Max-Planck-Institut für Chemische Physik fester Stoffe, Dresden, Germany

The ground state properties and finite temperature behavior of the $S = 1/2$ frustrated Heisenberg model on the 2D orthorhombic lattice are studied using exact diagonalization. This model, named as the $J_{1a,b} - J_2$ model, can be used to describe the low energy spin excitation of the parent compounds of newly discovered iron based superconductors, as well as two classes of layered vanadium phosphate, based on the data obtained from inelastic neutron scattering. Using the finite temperature Lanczos method, the ground state energy and the temperature dependence of the specific heat, magnetic susceptibility and staggered magnetization are calculated. For the latter different lattice sizes and geometries are used to investigate the finite size effect.

MA 33.51 Fri 11:00 Poster B1

Magnetic Properties of the quasi-2D S=1/2 Heisenberg antiferromagnet $[Cu(pyz)_2(HF_2)]PF_6$ — •Mykhaylo Ozerov — Hochfeld-Magnetlabor Dresden (HLD), Forschungszentrum Dresden - Rossendorf, Dresden, Germany

We report on electron spin resonance, high-field magnetization, and specific-heat studies of $[Cu(pyz)_2(HF_2)]PF_6$ single crystals, identified as a quasi-two-dimensional spin-1/2 Heisenberg antiferromagnet. Our measurements revealed $J_{inter}/J_{intra} \le 0.063$ and $A/J \sim 0.003$, where J_{inter}, J_{intra}, J are the interplane, intraplane and mean exchange interactions, respectively, and A is the anisotropy constant. It is argued that the magnetic properties of this material (including high-magnetic-field magnetization and the temperature-field phase diagram) are strongly affected by two-dimensional spin fluctuations, despite of onset of 3D long-range magnetic ordering at $T_N \approx 4.4$ K. The ESR magnetic excitation spectrum in the 3D ordered phase is studied in detail.

The work was made in collaboration with E. Čižmár, R. Beyer, M. Uhlarz, Y. Skourski, S.A. Zvyagin J. Wosnitza, J.L. Manson, J.A. Schluter.

MA 33.52 Fri 11:00 Poster B1

Stability of ferromagnetic order in monoatomic transition-metal nanowires : A first-principles study of the effective exchange interactions between local moments — •Muhammad Tanveer, Pedro Ruiz Diaz, and Gustavo Pastor — Institut für Theoretische Physik, Universität Kassel, Heinrich Plett Straße 40, 34132 Kassel, Germany

A first principles study of the stability of the magnetism in transition-metal (TM) nanowires (NW) is presented. Constrained spin moment calculations of the effective exchange interactions between local moments in V, Fe and Co nanowires are performed in the framework of a generalized gradient approximation (GGA) to density-functional theory (DFT). In the case of V wires, ferromagnetic (FM) order is stable at the equillibrium nearest neighbor (NN) distance of the free standing wire. However, very small changes in the NN distance render FM order unstable. A transition from FM to spiral spin-density wave (SDW) order is found upon a contraction of about 1%. This remarkable result is interpreted in terms of the distance dependance of the effective exchange intractions J_{ij} between first, second, and third NN moments. Results are also given for the electronic density of states as a function of wave vector q of the spiral SDW state, which could be observed in STM experiments. Finally, the V results are contrasted with ongoing studies on Fe and Co wires.

MA 33.53 Fri 11:00 Poster B1

Magnetic fluctuations in FeRh. — •Leonid Sandratskii — Max Planck Institute of Microstructure Physics, Halle, Germany

FeRh experiences a first-order phase transition antiferromagnet-ferromagnet at about 350 K and can be treated as a natural magnetic multilayer system where large magnetoresistance can be easily realized. Recent time-resolved pump and probe experiments have shown an ultra-fast transition to the ferromagnetic state within femtosecond time scale. Despite much efforts devoted to the study of FeRh the nature of the phase transition remains the matter of debates. Although it is now clear that the Rh moments play crucial role in the stabilization of the ferromagnetic phase there is no consensus with respect to the selection of the magnetic degrees of freedom to describe the thermodynamical equilibruium. Some researches assume that the Rh moments