allow for a diffusion of energy via resonant flip-flop processes. This contribution is expected to be much smaller than that due to phonons. In search of such a contribution we have performed measurements on two planar glass samples which contain holes of different size on a triangular lattice that serve as extra scatterers for phonons. For measuring thermal conductivity of such diminutive magnitude we used a SQUID-based contact-free technique because of its extremly small parasitic heating. Our results show that the thermal conductivity varies roughly with T^3 down to about 50 mK as expected for phonons in the boundary scattering regime. Below this temperature, the thermal conductivity follows a weaker power law. Though this is expected for thermal transport via mutually interacting tunneling systems the absolute value appears to be surprisingly high compared to theoretical predictions. Therefore it remains an open question whether the observed deviation is indeed caused by a non-phononic contribution, or whether this is a consequence of the wave length of the phonons becoming larger than the lattice constant of the array of holes.

TT 21.14 Wed 14:00 Poster A

Numerical simulation of the influence of nuclear moments on two- pulse polarization echoes in glassy glycerol — •Gudrun Fickenscher[1], Masoomeh Bazrafshan[1], Kathrin Reinhold[1], Marek Bartkowiak[2], Herbert Zimmermann[3], Andreas Fleischmann[1], and Christian Enss[1] — [1]Kirchhoff-Institut für Physik-Universität Heidelberg — [2]Forschungszentrum-Rossendorf-Dresden — [3]Max-Plank-Institut für Medizinische Forschung-Heidelberg

At low temperatures - below a few Kelvin - the properties of glasses are dominated by the tunneling motion of atomic tunneling systems in a double well potential. A few years ago it was shown that tunneling particles having a nuclear qudrupole moment experiencing electric field gradient cause magnetic field effects in non-magnetic glasses. This effect is observed using the method of two pulse polarization echoes, looking at the magnetic field dependence as well as the time dependence of echo amplitude. Recently, we observed that the presence of interacting magnetic dipole moments leads to qualitatively similar effects on a smaller magnetic scale. In this work we developed numerical techniques to simulate the amplitude of the two- pulse polarization echo, having flexibility of including any number of dipole and quadrupole moments corresponding to H and D atoms in partially deuterated samples. The simulations are done assuming a specific microscopic model of tunneling motion with specific distributions for tunneling parameters. The results of such simulations are presented comparing to experimental data.

TT 21.15 Wed 14:00 Poster A

Electronic transport properties of C-doped Mn_5Si_3 films — •B. Gopalakrishnan[1], Christoph Sürgers[1], and Hilbert v. Löhneysen[1,2] — [1]Physikalisches Institut, Universität Karlsruhe, D-76128 Karlsruhe — [2]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, D-76021 Karlsruhe

The incorporation of carbon into the antiferromagnetic Mn_5Si_3 compound gives rise to ferromagnetic order with a Curie temperature above room temperature. The microscopic origin of the C-induced ferromagnetism still needs to be explored. Here we report on the electronic transport properties of 100-nm thick $Mn_5Si_3C_x$ ($0 \leq x \leq 1.2$) films prepared by simultaneous magnetron sputtering of elemental Mn, Si, and C [1]. We observe distinct differences in the temperature dependence of the resistance R, magnetoresistance, and Hall effect of the ferromagnetic C-doped films compared to antiferromagnetic Mn_5Si_3. In particular, for films with an optimum doping level $x = 0.8$ inferred from previous magnetization measurements, we observe a metallic behavior of R and the lowest residual resistivity. At temperatures below 20 K a behavior $R \propto -\ln T$ is found, reminiscent of electron-electron interaction or weak-localization effects, although the films are much thicker than all relevant scattering lengths.

[1] C. Sürgers et al., Phys. Rev. B **68**, 174423 (2003)

TT 21.16 Wed 14:00 Poster A

Thermally and Optically Switched Spin States in $[Fe(pmd)(H_2O)\{Au(CN)_2\}_2] \cdot H_2O$. A revised phase diagram — Vladimir Gnezdilov[1], •Peter Lemmens[2], Patric Scheib[2], Yuri Georgii Pashkevich[3], Karina V. Lamonova[3], Elena S. Zhitlukhina[3], Virgine Niel[4], and Jose A. Real[4] — [1]Institute for Low Temperature Physics and Engineering, NASU, Kharkov, Ukraine — [2]Institut für Physik der kondensierten Materie, TU-Braunschweig, Braunschweig — [3]Donetsk Phystech, NASU, Ukraine — [4]Institut de Cienca Molecular / Departement de Química Inorg ànica, Iniversitat de València

Raman scattering in the spin-crossover $[Fe(pmd)(H_2O)\{Au(CN)_2\}_2] \cdot H_2O$ reveals a complex three-step spin-state transitions in contrast to observations in magnetization measurements. The switching between different spin states is recorded as function of temperature and irradiation with electromagnetic radiation in the visible spectral range. Work supported by DFG topical research center "Molecular Magnets" and ESF-HFM.

TT 21.17 Wed 14:00 Poster A

Analysis of mechanical loss processes of low loss materials for interferometric gravitational wave detectors in the low temperature range — •Daniel Heinert[1], Anja Zimmer[1], Ronny Nawrodt[1], Wolfgang Vodel[1], Andreas Tünnermann[2], and Paul Seidel[1] — [1]Institut für Festkörperphysik, FSU Jena, Helmholtzweg 5, 07743 Jena — [2]Institut für Angewandte Physik, FSU Jena, Albert-Einstein-Straße 15, 07745 Jena

Thermal noise introduced by mechanical losses is one main limitation in the detection frequency band of interferometric gravitational wave detectors. Cooling of the optical components could produce a relief insofar as materials featuring low mechanical losses at cryogenic temperatures are used. Influences of different loss mechanisms on the mechanical quality factor are presented, especially under consideration of the excited mode shape.

This work was supported by the DFG under contract SFB Transregio 7.

TT 21.18 Wed 14:00 Poster A

Mechanical Loss Measurements on Calcium Fluoride Bulk Material at Low Temperatures — •Christian Schwarz[1], Ronny Nawrodt[1], Anja Zimmer[1], Sandor Nietzsche[1], Wolfgang Vodel[1], Andreas Tünnermann[2], and Paul Seidel[1] — [1]Friedrich-Schiller-University Jena - Institute of Solid State Physics, Helmholtzweg 5, 07743 Jena, Germany — [2]Friedrich-Schiller-University - Institute of Applied Physics, Albert-Einstein-Straße 15, 07745 Jena, Germany

Interferometric gravitational wave detectors are one of the most sensitive devices ever developed. The detectors currently in use are limited by different kinds of noise. One of the fundamental noise sources is thermal noise. To lower thermal noise within the detection band it is necessary to use low mechanical loss materials as optical components.

One promissing candidate as a low loss material is calcium fluoride. Detailed measurements of the mechanical loss of single crystal calcium fluoride samples (Dia. 76.2 $mm \times 75$ mm) are presented within a temperature range from 5 to 300 K. The lowest loss was observed at 65 K as 3.6×10^{-9}. Possible damping mechanisms are discussed and compared with the experimental results.

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TT 21.19 Wed 14:00 Poster A

Soft phonon modes in phase change materials — •Dominic Lencer[1], Blazej Grabowski[2], Jörg Neugebauer[2], and Matthias Wuttig[1] — [1]I. Physikalisches Institut (1A), RWTH Aachen, D-52056 Aachen — [2]Max-Planck-Institut für Eisenforschung, Max-Planck-Straße 1, D-40237 Düsseldorf

Among the candidates for non-volatile memories succeding Flash *phase change RAM (PCRAM)* is attracting much interest from basic and industrial research groups. It is based on reversible electrically induced switching of small cells between an amorphous and crystalline state.

In general, the employed metastable crystalline phases of alloys used for PCRAM devices resemble slightly distorted cubic structures. In order to investigate the particular distortions, phonon dispersions were calculated for the symmetric cubic phases of GeTe, Sb_2Te_3 and $GeSb_2Te_4$ using density functional calculations using both the linear response and a direct method. Soft phonon modes were identified and sampled to yield models for the distorted phases. Properties of both undistorted and distorted phases are presented and compared to experimental data.

TT 21.20 Wed 14:00 Poster A

Low-temperature phonon dispersion in 2H-$NbSe_2$ by inelastic neutron scattering and ab-inito calculations — •Karin Schmalzl[1,2], Arno Hiess[2], Dieter Strauch[3], and Helmuth Berger[4] — [1]Forschungszentrum Juelich, 52425 Juelich, Germany —