Session 26aC

Anomalous Hall Effect of Pyrochlore Mo Oxides with Spin Charlity 26aC1

Yoshinori Tokura[a]

Spin Superstructure Porject, ERATO, JST, c/o AIST, Tsukuba 305-0046, Japan
[a]Department of Applied Physics, University of Tokyo, Tokyo 113-8656, Japan

An electron hopping on non-colanar spin sites with spin chirality obtains a Berry phase that acts as an internal fictious magnetic field. The unconventioanl anomalous Hall effects observed in pyrocholre-type Nd2Mo2O7 and related compounds are shown to arise from this effect.

Charge ordering, phase separation and electron transport in manganites 26aC2

Maxim Yu. Kagan[a], Kliment I. Kugel[b], Alexander L. Rakhmanov[b]

[a]P.L.Kapitza Institute for Physical Problems, Kosygin street 2, 117334 Moscow, Russia
[b]Institute for Theoretical and Applied Electrodynamics, Izhorskaya street 13/19, Moscow, Russia

A simple model of CO is considered. It takes into account both the Coulomb repulsion at neighboring sites and the essential magnetic interactions. It is shown explicitly that at any deviation from half-filling ($n \neq 1/2$) the system is unstable with respect to phase separation into the regions corresponding to CO $n = 1/2$ and metallic regions with smaller electron or hole density. Possible structure of this phase-separated state (metallic droplets in the CO matrix) is discussed. We estimate the parameters of these droplets and construct the phase diagram. We calculate the conductivity, magnetoresistance and noise spectrum for the phase-separated state. The charge transfer in the system is assumed to occur due to the electron tunneling from one droplet to another.

26aC3 Anisotropy of energy transport and spin-phonon interaction in $S = 1/2$ chain cuprate $BaCu_2Si_2O_7$

A. V. Sologubenko[a], H. R. Ott[a], G. Dhalenne[b], A. Revcolevschi[b]

[a]*Laboratorium für Festkörperphysik, ETH Hönggerberg, CH-8093 Zürich, Switzerland*
[b]*Laboratoire de Physico-Chimie des Solides, Université Paris-Sud, 91405 Orsay, France*

The thermal conductivity κ of the spin-1/2 chain cuprate $BaCu_2Si_2O_7$ was measured along different crystallographic directions in the temperature region between 0.5 and 300 K. The thermal conductivity along the chain direction considerably exceeds that along perpendicular directions. Near the antiferromagnetic transition at $T_N = 9.2$ K the data indicates enhanced scattering of phonons by critical fluctuations in the spin system. Applying external magnetic fields as large as 6 T has little influence on the behaviour of $\kappa(T)$. The spin contribution to the energy transport is estimated from the anisotropy of $\kappa(T)$ and from the strength of the scattering of phonons near T_N.

26aC4 Peculiar Roles of Spins in the Thermal Conductivity of Pure and Doped La_2CuO_4: Comparison with $CuGeO_3$

Yoichi Ando, X. F. Sun, J. Takeya, Seiki Komiya

Central Research Institute of Electric Power Industry, Komae, Tokyo 201-8511, Japan

In magnetic materials, spin excitations can carry heat and scatter electrons and phonons, thereby affecting the thermal conductivity. Recent studies of the heat transport in low-dimensional cuprate systems [e.g. Y. Ando *et al.*, PRB **58** (1998) R2913] have demonstrated that the spin-related heat transport is very useful for extracting information on the peculiar spin systems in these compounds. In this talk, we report measurements of the anisotropic thermal conductivity κ of pure, hole-doped, and Zn-doped La_2CuO_4 single crystals, and discuss the roles of magnons and the spin stripes in the heat transport in these systems. Comparison with the heat transport in $CuGeO_3$, which shows similar $\kappa(T)$ behavior as that of La_2CuO_4, gives us a lesson of how the behavior of $\kappa(T)$ reflects the difference in the spin ground states.

26aC5 Magnetization rotation or generation of incoherent spin waves? Suggestions for a spin-transfer effect experiment.

Ya.B. Bazaliy[a], B.A. Jones[b]

[a]*Argonne National Laboratory, MSD, 9700 S. Cass Ave, Argonne, IL 60439, USA*
[b]*IBM Almaden Research Center, 650 Harry Road, San Jose, CA 95120, USA.*

"Spin-transfer" torque is created when electric current is passed through metallic ferromagnets and may have interesting applications in spintronics. So far it was experimentally studied in "collinear" geometries, where it is difficult to predict whether magnetization will coherently rotate or spin-waves will be generated. Here we propose an easy modification of existing experiment in which the spin-polarization of incoming current will no longer be collinear with magnetization and recalculate the switching behavior of the device. We expect that a better agreement with the magnetization rotation theory will be achieved. That can be an important step in reconciling alternative points of view on the effect of spin-transfer torque.