SFB 608

Einladung zum Kolloquium

Ort: Universität zu Köln
II. Physikalisches Institut, Seminarraum 201

Zeit: 02. Mai 2007, 14:30 Uhr

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Thema: Magnetothermal transport in a spin-1/2 chain compound

A number of non-trivial effects were recently predicted for the spin thermal conductivity of the Heisenberg antiferromagnetic spin S=1/2 chain in external magnetic fields B. Here, we present experiments on the thermal transport in the S=1/2 chain compound copper pyrazine dinitrate $Cu(C_4H_4N_2)(NO_3)_2$. The heat conductivity shows a surprisingly strong dependence on the applied magnetic field B, characterized at low temperatures by two main features. The first one appearing at low B is a characteristic dip located at $\mu_B B \sim k_B T$, that may arise from Umklapp scattering. The second one is a plateau-like feature in the quantum critical regime, μ_B $|B-B_c|<k_B T$, where B_c is the saturation field at T=0. The latter feature clearly points towards a momentum and field independent mean free path of the spin excitations, contrary to theoretical expectations.
We also present recent data on the magnetothermal transport in the spin-1/2 two-leg ladder compound $(Hpip)_2CuBr_4$.

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