



TRR 80 Sonderseminar

Am Mittwoch, den 12. März um 13:30 Uhr

spricht

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über das Thema

Magnetic soft modes in the distorted triangular antiferromagnet α -CaCr₂O₄

α -CaCr₂O₄ is a spin-3/2, distorted triangular lattice Heisenberg antiferromagnet. It develops long-range magnetic order below $T_N=42$ K where the angles between nearest neighbor spins are 120° on the triangular planes. The symmetric magnetic structure masks the complex pattern of exchange interactions [1]. The magnetic excitation spectrum has been measured for the first time using inelastic neutron scattering on powder and single crystal samples. It reveals unusual low energy modes, which can be explained by linear spin-wave theory assuming a complex set of 1st and 2nd neighbor exchange interactions. [2-3] The fitted exchange interactions correlate well with the Cr³⁺-Cr³⁺ distances and are in agreement with other chromium delafossite compounds. The mode softening is due to the instability of the 120° structure. This is supported by the calculated magnetic phase diagram, where the fitted exchange parameters put α -CaCr₂O₄ close to the phase boundary of the 120° structure in exchange parameter space.

References:

- [1] S. Toth, B. Lake et. al., Phys. Rev. B, 84, 054452 (2011)
- [2] S. Toth, B. Lake et. al., Phys. Rev. Lett., 109, 127203 (2012)
- [3] D. Wulferding, K. Choi et al., J. Phys.-Condens. Mat., 24, 435604 (2012)

Gäste sind herzlich willkommen.

Der Vortrag findet im Seminarraum S-403 / Institut für Physik, Universität Augsburg statt.

Gastgeber: Michael Schmidt
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