



Sonderseminar TRR 80

am Mittwoch, 11.07.2012

um 14:00 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 pattern of 1st and 2nd neighbor 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.

im Seminarraum 2224 im Physik-Department