



Universität Leipzig
Fakultät für Physik und
Geowissenschaften
Institut für Theoretische Physik

Gemeinsames

NTZ-DFH-UFA - Kolloquium

Am Donnerstag, dem 06.12.2012 um 17:00 Uhr spricht

Herr A. Barasinski
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über

“Magnetization-based assessment of correlation energy in canted Single-Chain Magnets”

We demonstrate numerically that for the strongly anisotropic homometallic $S = 2$ canted single chain magnet [1] described by the quantum antiferromagnetic Heisenberg [2] model the correlation energy and exchange coupling constant can be directly estimated from the in-field-magnetization profile found along the properly selected crystallographic direction. In the parameter space defined by the spherical angles (φ, θ) determining the axes orientation, four regions are identified with different sequences of the characteristic field-dependent magnetization profiles representing the antiferromagnetic, metamagnetic and weak ferromagnetic type behavior. These sequences provide a criterion for the applicability of the anisotropic quantum Heisenberg model to a given experimental system. Our analysis shows that the correlation energy decreases linearly with field and vanishes for a given value H_{cr} which defines a special coordinates in the metamagnetic profile relevant for the zero-field correlation energy and magnetic coupling. For the single chain magnet formed by the strongly anisotropic manganese(III) acetate meso-tetraphenylporphyrin complexes coupled to the henylphospinate ligands [3], the experimental metamagnetic-type magnetization curve in the c direction yields an accurate estimate of the values of correlation energy $\Delta\xi / k_B = 7.93$ K and exchange coupling $J/k_B = 1.20$ K.

Ort: ITP, Raum 210

Interessenten sind herzlich eingeladen!