



TRR 80 Sonderseminar

Am Dienstag, den 24. Juni um 13:00 Uhr

spricht

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über das Thema

Spinon excitations in doped and pressure-induced phases of quantum magnets

Low-dimensional quantum magnetism has long been at the center of attention in condensed matter physics. The primary reasons are the simplicity and beauty of such physical systems as well as adequate theoretical understanding behind them.

Here we describe two cases relating to emergence of spinons in quasi-one-dimensional systems.

In $\text{CuF}_2(\text{D}_2\text{O})_2(\text{pyz})$ (pyz=pyrazine) and at ambient pressure, the $S=1/2$ spins of Cu^{2+} ions form a square lattice, which originates mainly from the Jahn-Teller (JT) distortion defining orbital overlap and the magnetic exchange [1]. Evidence from bulk properties implies that above some critical pressure the system changes dimensionality due to a complete reorientation of the JT axis [2,3]. We were able to tune the system above the critical pressure and directly measure such a transition for the first time, employing inelastic neutron scattering.

SrCuO_2 is a model one-dimensional $S=1/2$ Heisenberg antiferromagnet, where spin-charge separation was observed in the pioneering work of Kim et al. [4]. We are investigating the low energy physics of this system upon doping of the spin-chain with non-magnetic and magnetic impurities (Co and Zn respectively). In the Co-substituted sample we observe a gapless excitation spectrum, in sharp contrast to recent work on the Ni-doped case [5].

- [1] P.A. Goddard et al., *New J. Phys.* 10, 083025 (2008).
- [2] G.J. Halder et al., *Angew. Chem. Int. Ed.* 50, 419 (2011).
- [3] S. Ghannadzadeh et al., *Phys. Rev. B* 87, 241102(R) (2013).
- [4] C. Kim et al., *Phys. Rev. Lett.* 77, 4054 (1996).
- [5] G. Simutis et al., *Phys. Rev. Lett.* 111, 067204 (2013).

Gäste sind herzlich willkommen.

Der Vortrag findet im Seminarraum von E21 / TU München in Garching statt.

Gastgeberin: Dr. Astrid Schneidewind
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