

# Diverging thermal expansion of the spin-ladder system $(C_5H_{12}N)_2CuBr_4$

Fabrizio Anfuso, Köln

We present high-resolution measurements of the thermal expansion and magnetostriction of piperidinium copper bromide. The experimental data at low and intermediate temperatures are very well described by a two-leg spin-ladder Hamiltonian with rung and nearest neighbor leg couplings. The thermal expansion shows a complex behavior with various sign changes and approaches a "one-dimensional"  $1/\sqrt{T}$  quantum critical divergence at the critical fields. As a consequence of a two-coupling constants model, the magnetostriction and thermal expansion along arbitrary spatial directions are always representable as linear combination of two simple spin correlation functions. We compute these functions with numerical and analytical methods and we find remarkable quantitative agreement along the three crystallographic directions for all the temperatures measured (from  $400\text{ mK}$  up to  $8\text{ K}$ !).

Reference:

T. Lorenz et al., cond-mat/0711.1510, to be published in PRL.