THERMAL-EXPANSION IN THE SHASTRY-SUTHERLAND COMPOUND $SrCu_2(BO_3)_2$

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Thermal-expansion experiments in the Shastry-Sutherland compound $SrCu_2(BO_3)_2$ were performed. $SrCu_2(BO_3)_2$ is a quasi-two dimensional system with a singlet dimer ground state. The geometrical frustration of the spin lattice results in very localized triplet excitations that crystallize at high magnetic fields.

Recent ESR [1] and specific heat [2] experiments at low temperatures and high magnetic fields cannot be explained unless an extra intra-dimer Dzyaloshinsky-Moriya interaction term, that violates the tetragonal crystal symmetry, is introduced in the Hamiltonian. [3]

To investigate a possible transition to a lower symmetry crystal structure we performed thermal-expansion measurements. Clearly, Figure 1 shows a peak in the linear thermal-expansion coefficient around 7.65 K along both crystallographic axis (**a** and **c**), very close to the temperature below which ESR and specific heat results need of that extra DM term to be explained. Ongoing neutron scattering experiments are being carried out to check if this peak in the thermal-expansion is related to a structural phase transition.

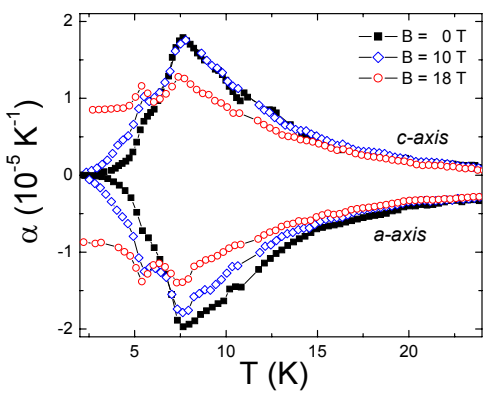

Figure 1 – Linear thermal-expansion coefficient along the c and a axis for different applied magnetic fields.

References

[1] Nojiri, H., *et al*., J. Phys. Soc. Jpn., **72**, 3243 (2003).
[2] Jorge, G., *et al*., cond-mat/0309534.
[3] El Shawish, S., to appear in Phys. Rev. B.