

THZ SPECTROSCOPY OF THE QUANTUM CRITICALITY IN A TRANSVERSE FIELD ISING CHAIN COMPOUND CoNb_2O_6

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The one-dimensional Ising chain in a transverse magnetic field is an ideal example of a system that undergoes an order-disorder transition at a quantum critical point. The columbite CoNb_2O_6 has been proposed as a good model system of the transverse field Ising chain allowing us to investigate the finite-temperature effects on quantum fluctuations near its quantum critical point [1]. We studied the Ising chain material CoNb_2O_6 using THz spectroscopy in high magnetic fields up to 17 T and down to 0.1 K. The system shows a softening of the spectrum as one approaches the quantum critical point at about 5.5 T from the ferromagnetic side. This collapse of energy scales is compared to predictions for quantum criticality in the 1D Ising model tuned by transverse field.

References

1. Coldea, R *et al.*, "Quantum Criticality in an Ising Chain: Experimental Evidence for Emergent E8 Symmetry", *Science*, **327**, 5962, pp. 177-180, 2010



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