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【7】Quantum Criticality and Dimensionality in Quasi-2D Spin-Dimer Systems

Tuesday 28 June 2022 12:15 (30 minutes)

Spin-dimer systems are an ideal testbed to study criticality because a quantum phase transition from a disordered to a magnetically ordered phase can be induced by a magnetic field. To determine the spin Hamiltonians of the spin-dimer compounds BaCuSi2O6 and Ba0.9Sr0.1CuSi2O6 inelastic neutron scattering experiments are performed at zero field and the magnetic order in BaCuSi2O6 is investigated using neutron diffraction up to 25.9 T. The phase boundary of Ba0.9Sr0.1CuSi2O6 is obtained by NMR and the critical exponent is determined using Bayesian inference. Quantum Monte Carlo simulations of the phase boundaries agree excellently with the form of both measured phase boundaries.

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