MAGNETIC QUANTUM PHASE TRANSITIONS IN DIMERIZED ANTIFERROMAGNETS

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S u m m a r y

A magnetic quantum phase transition (QPT) induced by a magnetic field in the system of exchange-coupled spin $S = 1/2$ dimers, forming a singlet in the ground state, has been considered theoretically. It has been shown that the transition of the system into a quantum antiferromagnetic (AFM) phase under the action of a magnetic field has a critical behavior. A spontaneously appeared spin polarization of the dimer is the order parameter of this phase transition. It has been shown that the absolute values of average spins of the sublattices in the quantum AFM phase depends on the magnetic field, whereas the magnetic susceptibility remains constant. It has also been demonstrated that, in the framework of the isotropic spin-spin interaction model, a transition between the quantum AFM and Néel phases is possible.