

Neutron Scattering Studies on Quantum Spin Systems - Spin Excitations in KCuCl_3 and NaV_2O_5 -

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We present the results of inelastic neutron scattering experiments on quantum spin systems KCuCl_3 and NaV_2O_5 . Both compounds show non-magnetic singlet ground state behaviour at low temperature. An important insight into the origin of the spin excitation gap can be obtained by looking at the wave vector dependence of the magnetic excitations in these systems without a Néel order. KCuCl_3 turns out to be a weakly coupled dimer system, in contrast to the initially assumed zig-zag chain or ladder system. NaV_2O_5 on the other hand was first thought to be a linear chain system undergoing a spin-Peierls transition, but it turns out to be most likely a zig-zag charge ordered ladder system at low temperature.

KEYWORDS: KCuCl_3 , NaV_2O_5 , quantum spin system, spin excitations, neutron scattering