

Abstract Submitted  
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**Neutron scattering study of strong- and weakly-coupled, spin-1/2 spin-ladders** BELLA LAKE, S. NOTBOHM, D.A. TENNANT, Hahn-Meitner Institut, T.G. PERRING, C.D. FROST, R.I. BEWLEY, P. MANUEL, K.P. SCHMIDT, G.S. UHRIG, P. RIBEIRO, C. SEKAR, R. KLINGELER, C. HESS, G. KRABBES — This presentation will discuss two-leg spin-ladders where the magnetic ions have spin-1/2 moments and antiferromagnetic exchange interactions. In the limit of strong rung coupling, the magnetic spectrum is dominated by the gapped magnon mode of an antiferromagnetic dimer, introduction of leg coupling modulates this mode. In the limit of weak rung coupling the excitations are similar to the multi-spinon continuum of the one-dimensional, spin-1/2, Heisenberg antiferromagnet, although the gap remains in the presence of infinitesimal rung coupling. Cyclic exchange interactions are often found in spin-ladders and reduce the gap size. Inelastic neutron scattering measurements will be presented for two ladders.  $\text{La}_4\text{Sr}_{10}\text{Cu}_{24}\text{O}_{41}$  has strong rung coupling and excitations consisting of a gapped one-magnon mode and a two-magnon continuum. In contrast  $\text{CaCu}_2\text{O}_3$  has a weak rung interaction and a substantial cyclic exchange which drives the system gapless and quantum critical. The excitations are similar to a multi-spinon continuum of a spin-1/2 chain, however the presence of rung coupling is revealed by a modulation parallel the rung at low energies.

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