GROUND STATE PROPERTIES OF ANTIFERROMAGNETIC CHAINS WITH UNRESTRICTED SPIN ;

INTEGER SPIN CHAINS AS REALISATIONS OF THE O(3) NON-LINEAR SIGMA MODEL.

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Abstract

A continuum limit treatment of planar spin chains with arbitrary S is presented.
The difference between integer and half-integer spins is emphasised. While isotropic
half-integer spin chains are gapless, and have power-law decay of correlations at $T = 0$
with exponent $\eta = 1$, integer spin systems have a singlet ground state with a gap
for $S = 1$ excitations and exponential decay of correlations. The easy-plane to
easy-axis transition is described.

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