

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Phase diagram of the frustrated spin ladder OLEG STARYKH, University of Utah, TOSHIYA HIKIHARA, Hokkaido University, Japan — We re-visit the phase diagram of the frustrated spin-1/2 ladder with two competing inter-chain antiferromagnetic exchanges, J_{\perp} and J_{\times} . We suggest, based on the accurate renormalization group analysis of the low-energy Hamiltonian of the ladder, that marginal inter-chain current-current interaction plays central role in reducing the stability of the intermediate columnar dimer phase centered around the classical degeneracy line $J_{\perp} = 2J_{\times}$. Following this insight we then suggest that changing these competing inter-chain exchanges from the previously considered antiferromagnetic to the *ferromagnetic* ones eliminates the issue of the marginal interactions altogether and dramatically expands the region of stability of the columnar dimer phase. This analytical prediction is convincingly confirmed by the extensive density matrix renormalization group and exact diagonalization calculations.

Oleg Starykh
University of Utah

Date submitted: 19 Nov 2009

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