

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Quantum Criticality and Neutron Scattering Solutions for a Spin-1/2 Ladder Model¹ JUSTIN COHEN, JEREMIAH BARRY, MARK MEISEL, University of Florida — Exact solutions for a two dimensional, $S = 1/2$ quantum spin ladder model are obtained through mapping the Hamiltonian and correlation functions onto those of a one dimensional Ising chain model [1]. These solutions include a three dimensional ground state phase diagram, establishing states of ladder rung singlets, triplets, and alternating singlets and triplets in terms of interaction parameters and applied magnetic field. Evidence of quantum criticality is uncovered for select regions of the phase diagram through explorations into ladder site correlations and correlation lengths. Neutron scattering solutions for scattering intensities provide insight into the energy spectra associated with various rung spin configurations.

[1] J. H. Barry and M. W. Meisel, *Phys. Rev. B* **58**, 3129 (1998).

¹This work was supported, in part, by the National Science Foundation via DMR-0701400 and grants for the NHMFL and UF Physics REU Summer 2007 Programs.

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Date submitted: 26 Nov 2007

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