Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Entanglement Perturbation Theory for Antiferromagnetic Heisenberg Chains. LIHUA WANG, SUNG CHUNG, Western Michigan University — We use a novel method, Entanglement Perturbation Theory (EPT) to solve the Heisenberg chain comprehensively for both spin 1/2 and spin 1. A variety of quantities for xxx model and xxz model are calculated, including the ground state energies, the spin-spin correlation functions, and the first excited state energies relevant to a phase transition. EPT allows us to calculate systems with nearly one thousand sites and obtain spin-spin correlation functions over hundreds of sites with unprecedented accuracy. The successful application of EPT to the Heisenberg model shows that it is simple, general and exact for macroscopic quantum systems with translational symmetry.

Lihua Wang
Western Michigan University

Date submitted: 20 Nov 2008 Electronic form version 1.4