

ALPS Assignment

International summer school on Computational Methods for Quantum Materials
Sherbrooke, 2014

Task

Simulate spin-1/2 Heisenberg ladders having ferromagnetic couplings on the rungs J_1 with Quantum Monte Carlo.

Investigate the magnetic susceptibility as a function of temperature for the following lattices and couplings:

- Simulate both the two-legged ladder and the three-legged ladder.
- Change the coupling along the chain J_0 to be either ferromagnetic and antiferromagnetic.

Always use couplings of equal strength, i.e. $|J_0| = |J_1| = 1$.

Send the resulting figure with the 4 curves to Ecole.Physique@USherbrooke.ca with “Last name, First name; ALPS” as a subject before Friday, June 13th. Comment on the physical interpretation of the results for $T \rightarrow 0$.

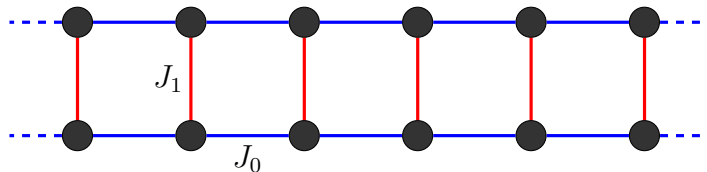


Figure 1: Example of the ladder system with J_0 couplings along the chains and J_1 on the rungs.