

Computational Physics (physics760)

Exercise 1

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1 Simulation of the 1D Ising Model

1. J is the interaction coefficient, and determines the strength of interaction between two adjacent lattice points. It's apparent from the Hamiltonian that $J = 0$ corresponds to a system in which there's no interaction between different points in the lattice. In such cases, the Hamiltonian has only one possible non-zero contribution, which is from the energy due to the external field. Further, $J > 0$ corresponds to ferromagnets, where the spins desire to be aligned (neighbouring spins have same signs). And, $J < 0$ corresponds to antiferromagnets, where the spins desire to anti-aligned (neighbouring spins have opposite signs).