Monte Carlo simulation of Ising model

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Abstract

This is the abstract, write this last.

1 Introduction

This is the introduction

- motivate the study
- present our questions and goals
- present an outline of the report

2 Theory

- Ising model
- Phase transitions
- Analytical calculations for 2x2
- Onsagers result for infinite systems
- Critical exponents

3 Method

- MCMC
  - Boltzmann factor
  - Periodicity
- Burn in
- paralleization done at temp level
- what numerical experiments have we performed?

4 Results and Discussion

- Compare analytical to numerical results for T = 1
- Report the number of MC cycles necessary for good agreement
- Plot of ordered and disordered equilibration

- State the estimated burn in time
- Plot of e for 20x20 grid
- timing tests with parallellization
- Plots of e, m, X, Cv for L = 40, 60, 80, 100 around T = [2.1, 2.4]
- comment on phase transition
- report Tc, estimate Tc(L)
- estimate Tc(L = inf)

5 Conclusions

Write a conclusion.