Report for Exercise 05

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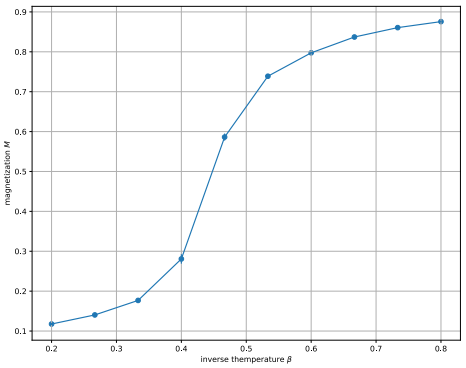
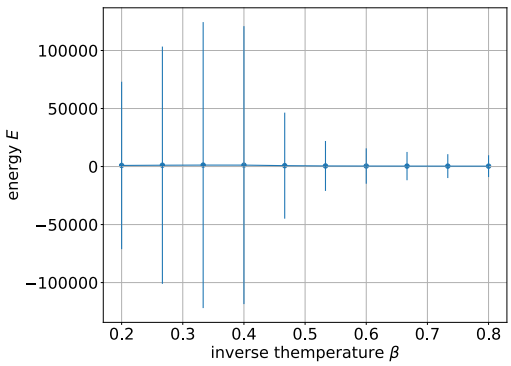
1 Task 1

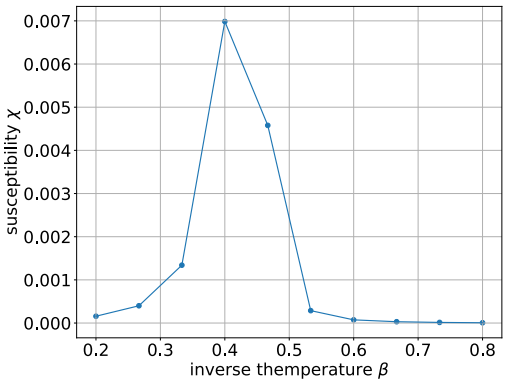
In Figure 1 one can see the plots for quantities obtained using the Metropolis algorithm on a three dimensional Heisenberg model.



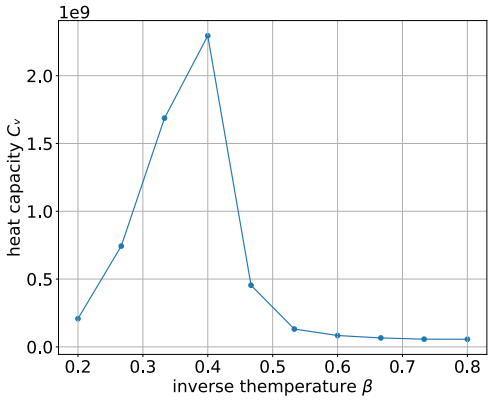
(a) plot of the liner magnetization over the inverse temperature



(b) plot of the liner energy over the inverse temperature



(c) plot of the liner susceptibility over the inverse temperature



(d) plot of the liner heat capacity over the inverse temperature

Figure 1: plots for different macroscopic quantities obtained from a metropolis simulation on a 3d Heisenberg model of size $L = 5$.

Something is wrong with the Energy plot but I was not able to fix it. One guess is that when computing the update energy ΔE we get big round off errors. Also I would expect the critical inverse temperature to be $b_c \approx 0.69$ where as the plots indicate it to be somewhere between 0.3 and 0.6.

2 Task 2 and Task 3

Unfortunately I was not able to do tasks 2 and 3 as my code for the wolf algorithm doesn't work and I didn't understand the solution because it is complicated to understand if you don't know c++. I think it would be nice if you could also provide a python solution such that it is easier to continue working on the exercises which depend on the previous ones.