Exercises for Computational Physics (physik760)
WS 2019/2020

B. Kostrzewa and C. Urbach

Exercises for the week from 7th to 10th of January 2020.

Ising Model

1: Ising Model:
During the last exercise you have implemented a Random-Walk Metropolis-Hastings algorithm for the Ising model at temperature T.
Implement in addidion the heat-bath algorithm and compare with Random-Walk Metropolis-Hastings algorithm in terms of autocorrelation times at fixed temperature T.

Slice Sampler

2: Consider the density

$$f(x) = \frac{1}{2} e^{-\sqrt{x}}$$

for $x > 0$. Implement a slice sampler for simulating this density. Generate a histogram of a large number of variates and compare to the density $f(x)$.
How does the efficiency of the slice sampler change if $\sqrt{x}$ is replaced with $x^{1/d}, \quad d > 2$ with increasing d.