

Corrected relaxation time

Axel Katona / TAUHO5

BME

20 January 2023

Abstract

This document is the corrected version of my semester project's relaxation-time measurement.

1 Relaxation time

To measure relaxation time of the (average) magnetization, I used $h = 0$, $K = 1$, $k_bT = 5$. Then I fitted an exponential to the first 1500 moves.

In the previous documentation, I did not mention that the 'relaxation time' I calculated, was the average of only a few measurements (4-5), and this is why the exponential form was not appropriate. Now, I have increased the number of measurements to 5000. For comparison, you can see the previous fitting on [1](#).

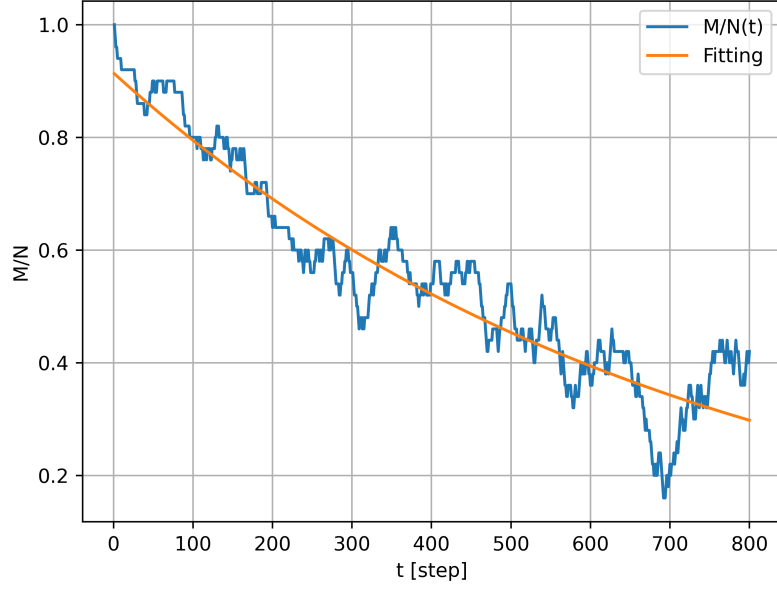


Figure 1: Fitting exponential- previous version, with only a few averaged measurements. In this setup I used $h = 1$ as external field. I also modified this value to $h = 0$ in the current version of the project.

With $N=5000$, the relaxation time I got was $(\tau = 214.7 \pm 0.4)$ time steps, and the fitting is on graph [2](#).

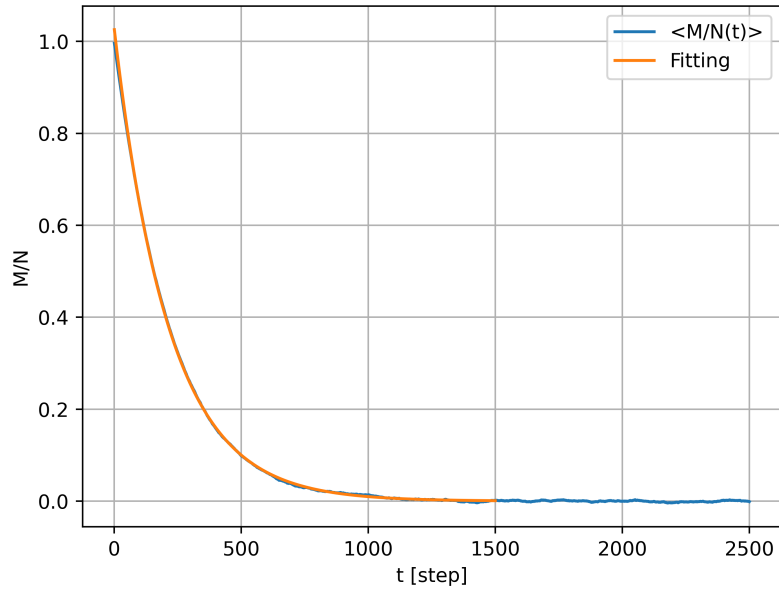


Figure 2: Fitting exponential- current version, with the average of $N=5000$ measurements.