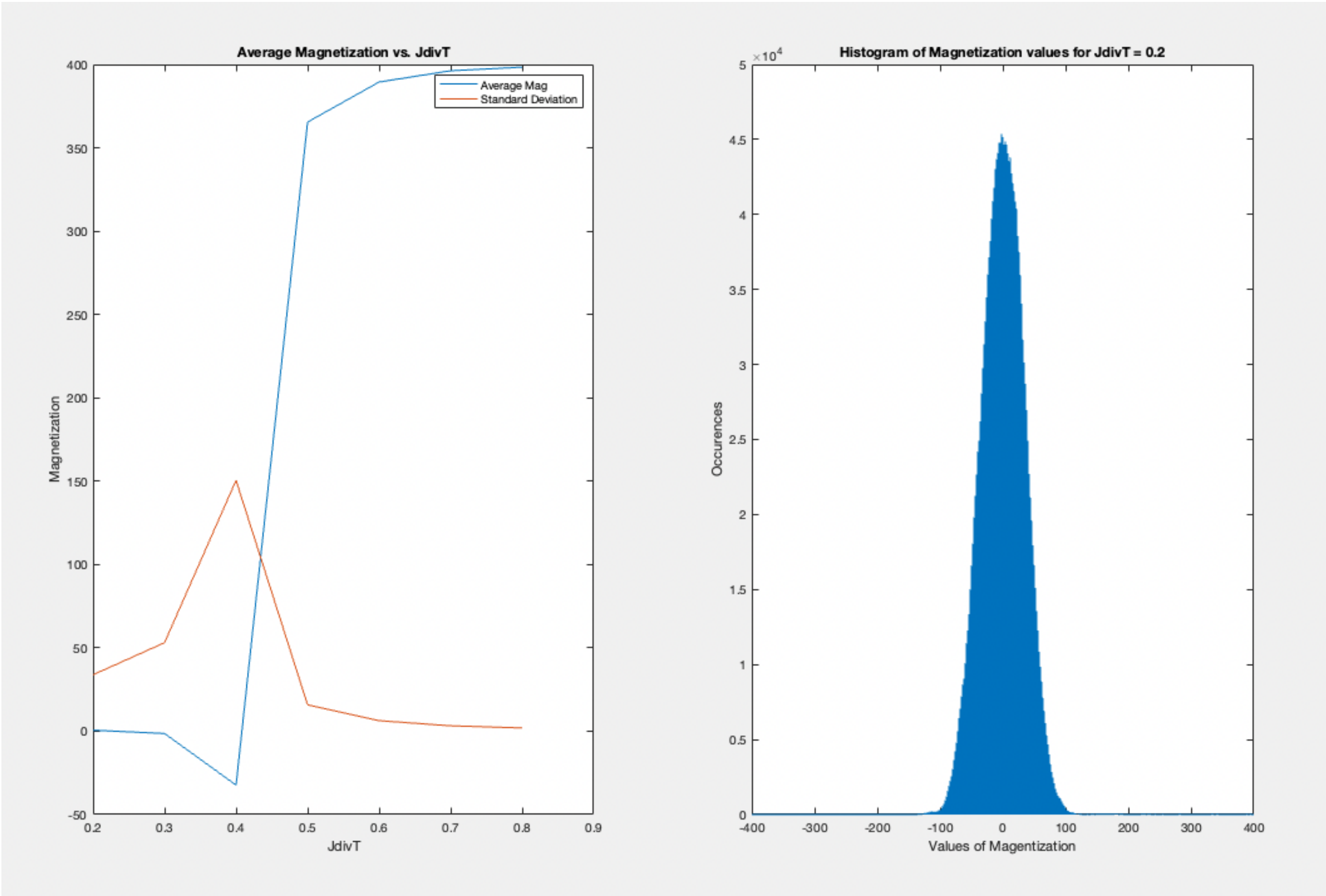
[Source Code:](#)



Average Magnetization vs. JdivT
Average Mag
Standard Deviation
Magnetization
JdivT
400
350
300
250
200
150
100
50
0
-50
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
Histogram of Magnetization values for JdivT = 0.2
×10^4
Occurences
Values of Magentization
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-400
-300
-200
-100
0
100
200
300
400

Let Γ_i be a set of N states $(\Gamma_1, \Gamma_2 \ldots)$. The Probability of being in the mth state is ρ_m.

Now, we define the metropolis transition matrix to be Π with elements π_{mn}, which applies to transitions from state m to n

$$\pi_{mn} \begin{cases} \alpha_{mn} & \rho_m \geq \rho_n \ (m \neq n) \\ (\rho_m / \rho_n)\alpha_{mn} & \rho_m \leq \rho_n \quad (m \neq n) \\ 1 - \sum_{m \neq n} \pi_{m'n} & \text{if } m = n \end{cases}$$

: If m likelihood > n likelihood, the transition element is just α_{mn}, an element of a symmetric attempt matrix α

First, we assume $\rho_m > \rho_n$

Now, according to our predefined rules:

$\pi_{mn} \rho_n = \alpha_{mn} \rho_n$ (m to n, greedy)

If we were to calculate the reverse transition instead:

$$\pi_{nm} \rho_m = \alpha_{nm} \frac{\rho_n}{\cancel{\rho_m}} \cancel{\rho_m}$$

$$\alpha_{nm} = \alpha_{mn} \quad \text{(because } \alpha \text{ is symmetric)}$$

$$= \alpha_{mn} \rho_n$$

Clearly, their flux is the same i.e. in a steady state.

If $\pi_{nm} \rho_m = \pi_{mn} \rho_n$, then we can say that $\Pi \rho = \rho$. This is because the flux from state $m \to n$ and state $n \to m$ cancel out, and ρ remains the same.