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# -*- coding: utf-8 -*-

import numpy
import random
import math
from matplotlib.pyplot import *
import ising2D

N = 30
ising = ising2D.Ising2D(N)
Tc = 2.0/(math.asinh(1.0))

"""ici on va calculer ((mean(m^2)-mean(m)^2)/T) pour different T """

def fox(k):
    M1=np.ones(k-1)
    M2=np.ones(k-1)
    raw=np.ones(k-1)
    a=np.ones(1000)
    for i in range(0,k-1):
        ising = ising2D.Ising2D(N)
        ising.temperature(1+(0.1*i))
        (mi,Mi,dM)=ising.boucle(1000)
        print(mi)
        print(np.size(mi))
        for k in range(0,np.size(mi)):""on calcul m^2 pour chaque donnee""
            a[k]=mi[k]*mi[k]
        M2[i]=np.mean(a) ""on en prend la moyenne""
        M1[i]=Mi*Mi ""on calcule mean(m)^2""
        raw[i]=((M2[i]-M1[i])/(1+0.1*i))""on calcule la susceptibilite pour un T""
    return M1,M2,raw

M1,M2,raw=fox(21)

T1=np.linspace(1,3,20)
plot(T1,raw,'g')
xlabel("T (temperature)")
ylabel("X (susceptibilité)")
title("X(t)")
savefig("X(t)3",format="png")

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