

In the name of God

Department of Physics
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COMPUTATIONAL PHYSICS

Exercise Set 3

(Date Due: 1393/07/30)

1. Compute the PDF of Random generator of computer.
2. Generate 1000 particles in a box containing the velocity corresponds to Maxwell-Boltzmann PDF.
3. Using simple method for generating random number with Gaussian pdf, make such data.
4. Using Box muller method, generate Gaussian random data. Check the correlation as well as pdf of two generated data sets.
5. Simulate a particle based on Langevin equation. Compute, variance of velocity, position and pdf of velocity and compare them with theoretical prediction.
6. Using data "*marks.txt*" and compute the PDF of these data sets. Then use a gaussian Kernel to smooth it. Use various values of σ for your kernel.
7. For random walk in $1D$, compute $\langle x(N) \rangle$ and σ_N^2 for following cases:
A: Suppose each steps coming form random variable with flat PDF.
B: Suppose the probability of step value is a gaussian and to be random.

Good luck, Movahed
