

In the name of God

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STOCHASTIC PROCESSES

Exercise Set 2

(Date Due: 1396/12/13)

1. PDF transformation:

A : Suppose to have Maxwell-Boltzmann distribution for velocity as $p(v) \sim \exp\left(-\frac{mv^2}{2kT}\right)$. Now write the PDF for energy ($p(E)$).

B : We made an harmonic oscillator inside a Black box. We open the door of black box randomly and take a snapshot from the position of oscillator. The recorded data at each snapshot makes a random series of the position of oscillator. Determine the probability density function of position of oscillator. Explain your result.

2. Using Box-Muller algorithm make a random Gaussian series. Based on simple method for computing PDF, compute PDF of generated data and compare it with a typical Gaussian function.

Good luck, Movahed
