

Advanced Comm. Theory Class Tutorial 3

November 22, 2021

1 Aims

1. To estimate the probability density function (pdf) of a signal from a set of data samples.

2 Data files

Data file “Ex03_Signal_Samples.mat” should be downloaded from ACT Classes Files.

3 Exercise: probability density functions

The provided data file “Ex03_Signal_Samples.mat” is a data file of $L = 1000$ complex samples of a white Gaussian signal $n(t)$. That is,

$$n(t) \sim \mathcal{CN}(\mu_n, \sigma_n^2) \quad (1)$$

1. Plot the magnitude (volts) of the signal $n(t)$;
2. Estimate the mean μ_n and the power σ_n^2 of the signal $n(t)$;
3. Write a MATLAB function to estimate and plot the pdf of the magnitude and the pdf of the phase of $n(t)$;
4. Compare the results of 3. with the theoretical pdfs.

4 Submission

Submission via OneNote Class Exercise. No later than Sunday 5th December.

5 Marking

Each tutorial submission will be marked as “Pass” or “Fail”: Pass = 1 mark; Fail = 0 mark.