Università di Genova

Exercise 1

Group 36

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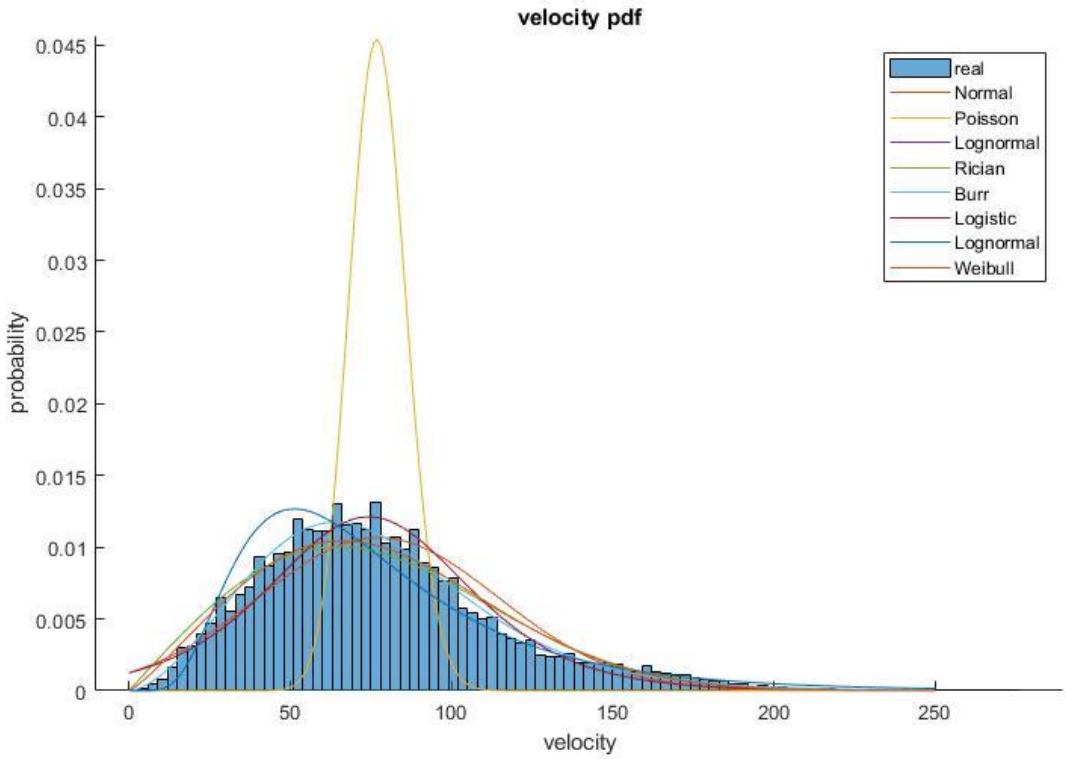
1. By evaluating mean, standard deviation and PDF of the ‘85m_max’data related to the wind velocity.

mean= 77.317 and std= 37.3569 ,

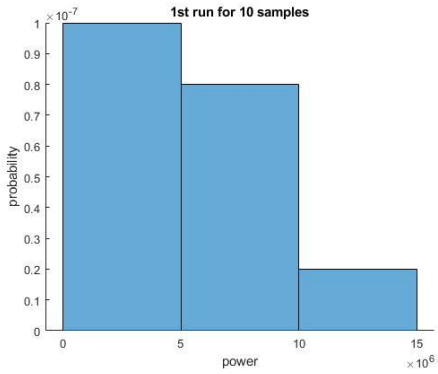
Then we fitted some different distributions on data so the best result is burr

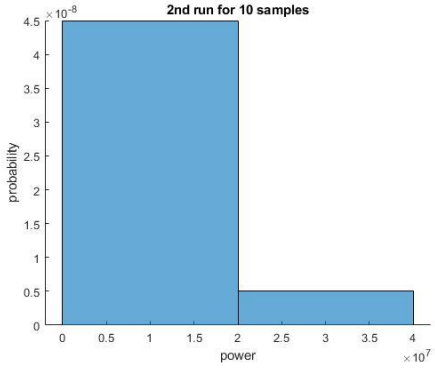


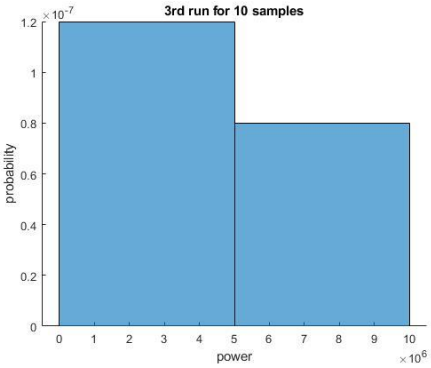
2 . By running the MC considering variables, wind velocity = 85m_max , A = 100m ± 0.2m and fixed variables, Cp=0.39 ρ = 1,225 kg/m3 as regards the PDF and other parameters founded at point1 with a different number of sampling (10, 10^3, $10^{5)}$. For each run of

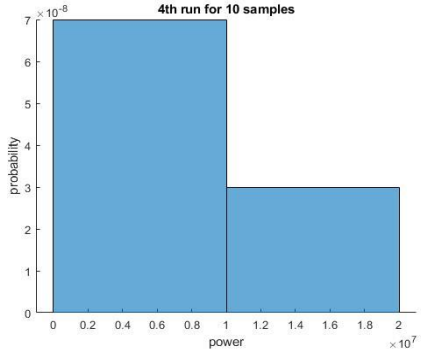
$$P = C_p \frac{1}{2} \rho A V^3$$

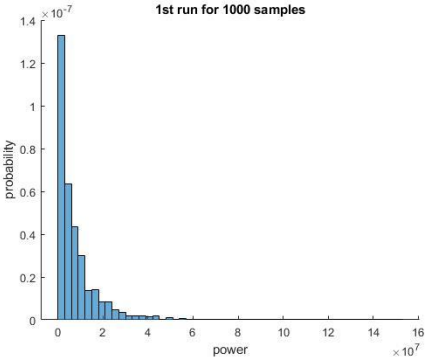
The purpose is to analyze the effect of different number of sampling and find the best sample which lead to the best result, we have these diagram as results

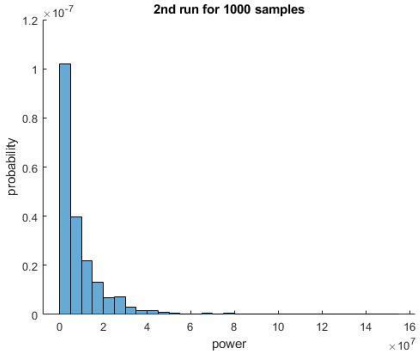

1st run for 10 samples
probability
power
×10^-7
×10^6

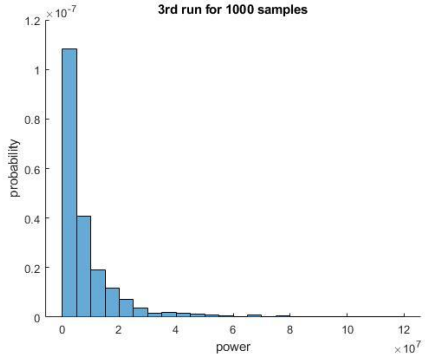

2nd run for 10 samples
probability
power
×10^-8
×10^7

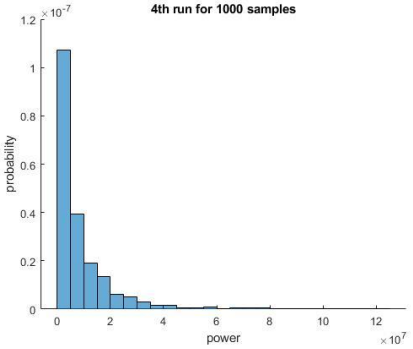

3rd run for 10 samples
probability
power
×10^-7
×10^6

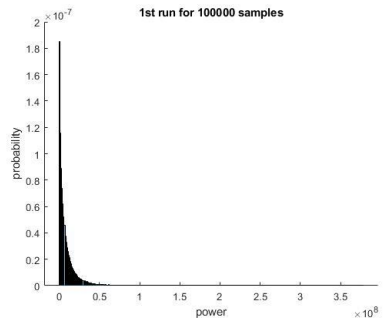

4th run for 10 samples
probability
power
×10^-8
×10^7

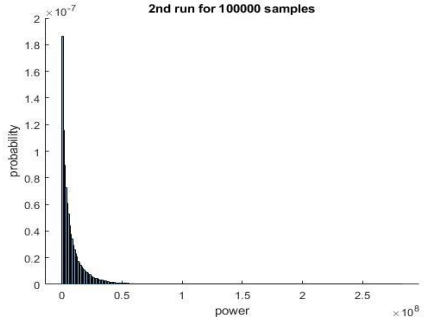

1st run for 1000 samples
probability
power
×10^-7
×10^7

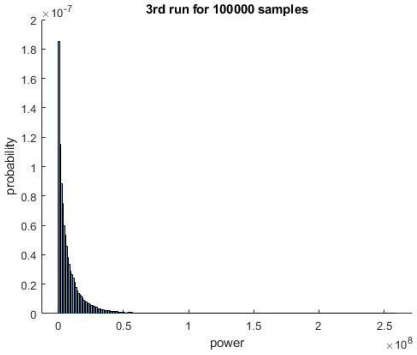

2nd run for 1000 samples
probability
power
×10^-7
×10^7

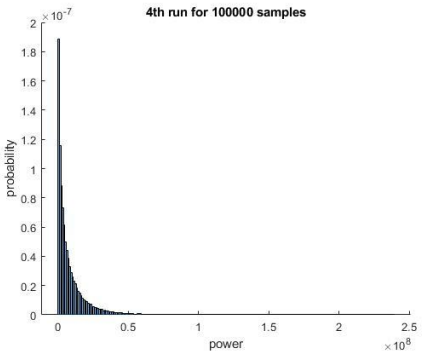

3rd run for 1000 samples
probability
power
×10^-7
×10^7


4th run for 1000 samples
probability
power
×10^-7
×10^7





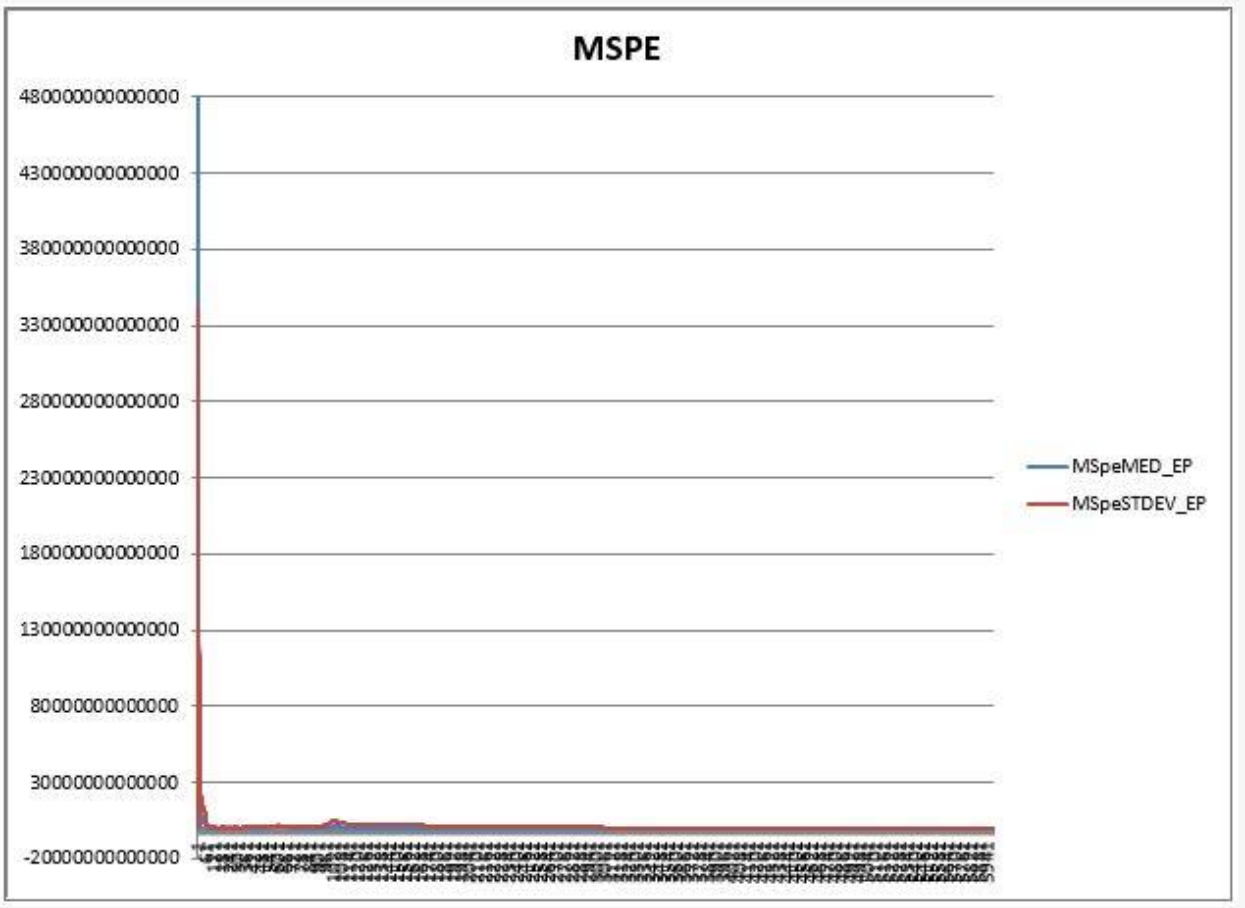




Mean & Sigma								
number of sampling	run . 1		run . 2		run . 3		run . 4	
	Mean	Sigma	Mean	Sigma	Mean	Sigma	Mean	Sigma
10	4850390.98	3044168.57	10586790.2	11774293.6	3489075.97	3300421.44	8354879.72	6457051.1
1000	7636785.83	10291001.2	8863217.96	12005560.7	8426356.65	12162566.1	8356280.09	11707354.9
100000	8649508.77	11986957.8	8650286.73	11884851.6	8666363.35	12011599.8	8692808.45	12147345.4

The table, depicts mean and sigma so as can be seen, the values of 10000, are close together which have the best and reasonable result of our tests.

3. As can be seen, by evaluating through the MSPE, the amount of error came together and decreased to zero and shows our chosen sample (10000) is correct


MSPE
480000000000000
430000000000000
380000000000000
330000000000000
280000000000000
230000000000000
180000000000000
130000000000000
80000000000000
30000000000000
-20000000000000
MSpeMED_EP
MSpeSTDEV_EP