

## Least Square Fit - Sorawich Maichum - sm9cq

The problem is about reproduce pseudo data and do the least square fitting with the following equation

$$f(x) = a + b \cdot \log(x) + c \cdot \log(x)^2$$

I reproduce 1,000 times of pseudo experiments.

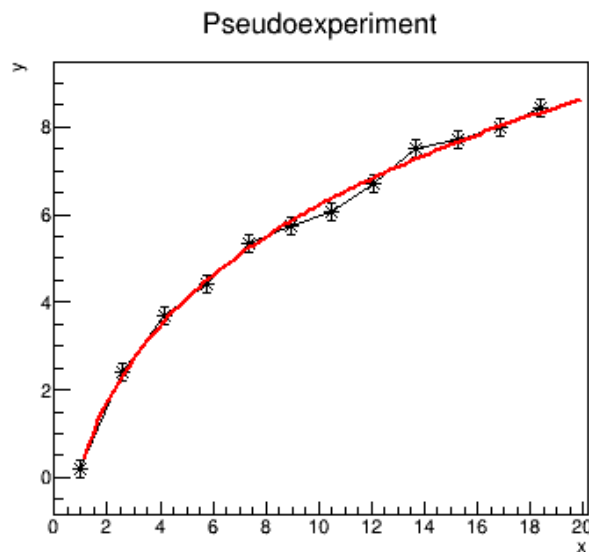


Figure 1 : The example of each pseudo experiment the point is the pseudodata and the redline is the least square fit of this experiment.

Then, repeat the experiment 1,000 times to get the distribution of a,b,c and Chi Square.

The distributions of a, b and c are like the gaussian distribution which means that is corresponding. At high number of repetitions make a Chi square converge to a gauss distribution as well which is agreed to theory of Central limit.

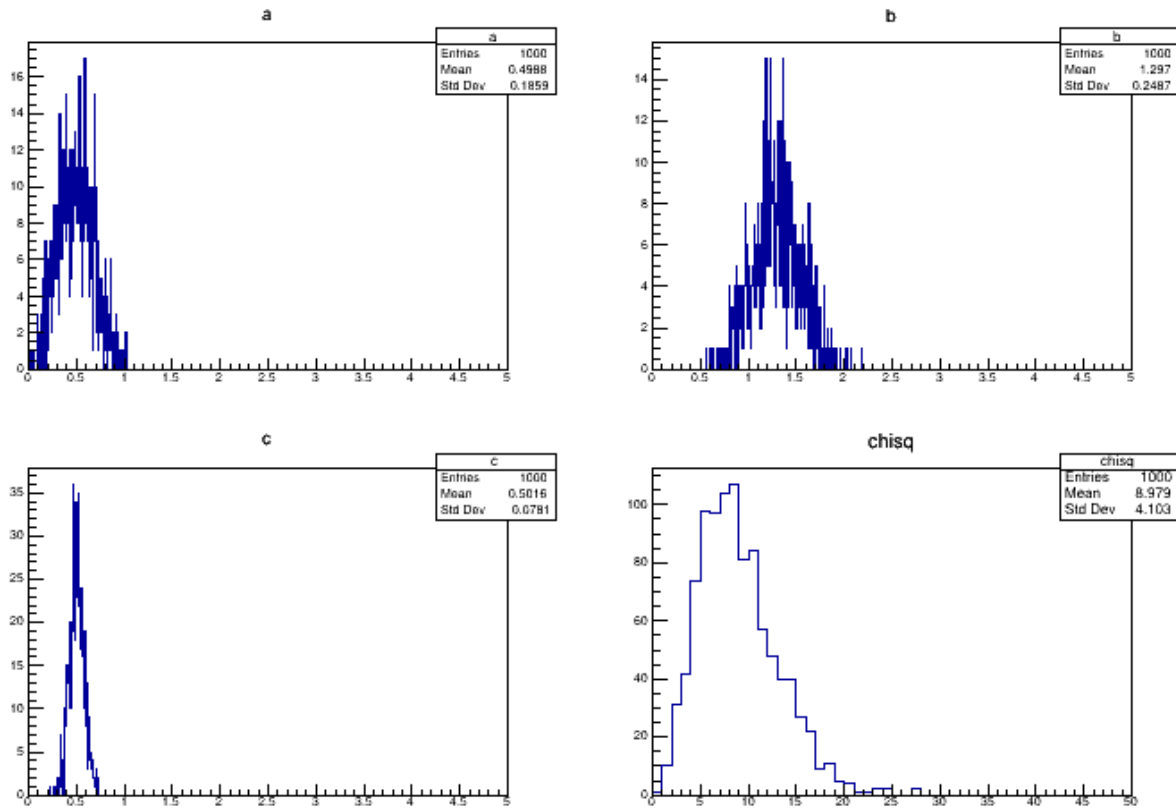


Figure 2 : The distribution of a, b, c and Chi square for 1,000 times pseudo experiment.

For the comparison of distribution between each of a, b and c is also a gaussian distribution in 2d These gaussians have different variance along with different axis.

The most importance is the reduced Chi square has a mean at 1 which is also agree with the prediction of the theorem.

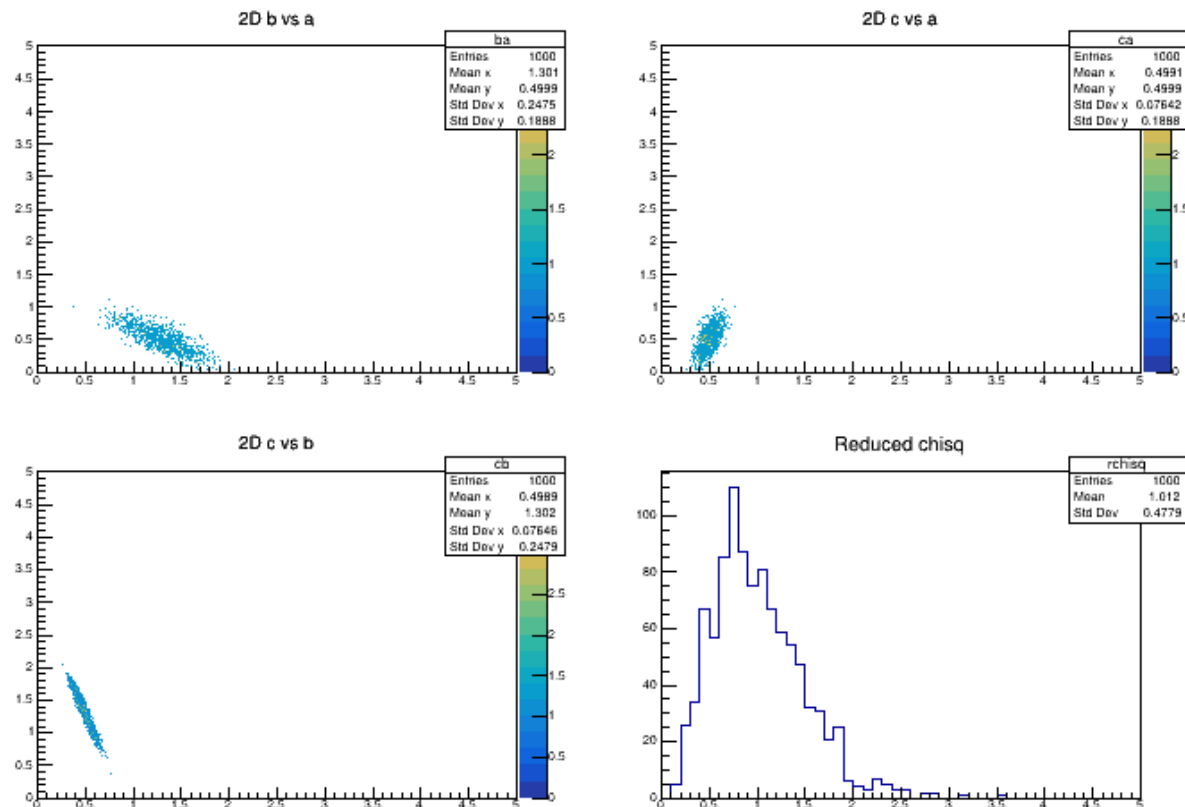


Figure 3 : These plots show the distribution of comparison of each parameters(a, b, c) which also show us the gaussian distributions. The fourth histogram show a converging to a gaussian distribution and its mean is around 1.