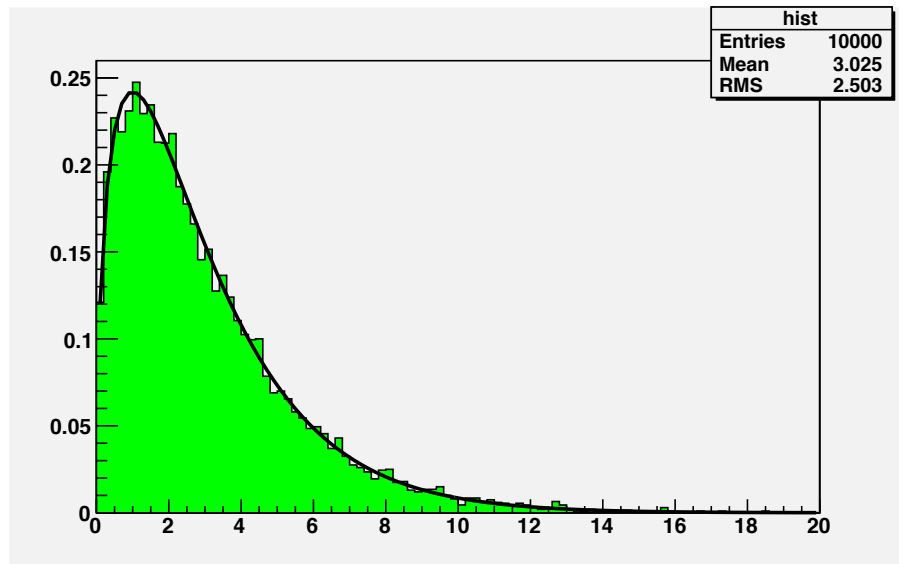


Computational Physics

Homework - May 06

Korea University
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I. In the class, we discussed the chi-square distribution and its meaning to the chi-square fits.



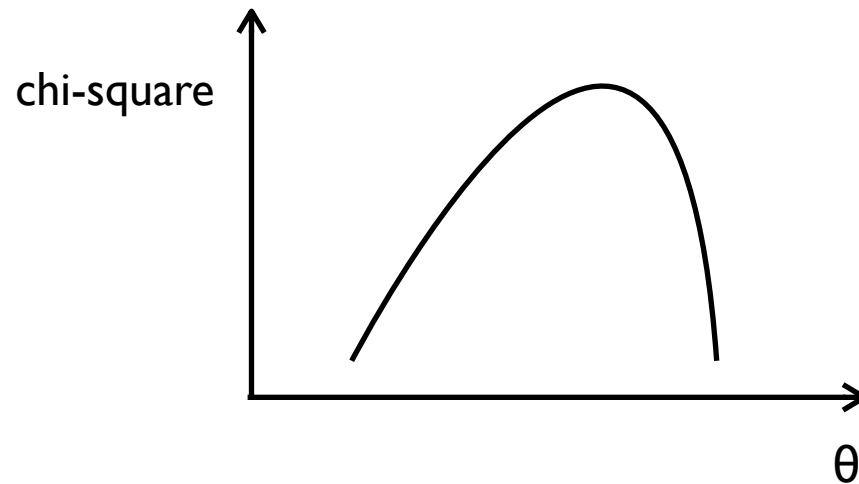
For example, we did the following comparison of the chi-square function and the actual distribution of the chi-square values from many fits.

The above plot is for n.d.f (number of degrees of freedom) = 3. Repeat the above comparison when n.d.f = 1, 5, 10, 30.

Draw the chi-square function when n.d.f. = 30 and also draw the gaussian p.d.f. in the same plot (with appropriate mean and sigma) so that they “match” each other. Can you calculate (chi-square - gaussian)/gaussian as a function of n?

2. In the class, we discussed the chi-square fits. Make a chi-square fit and obtain errors for your parameters.

Draw the following plot:



Is your chi-square maximum graphically at $\hat{\theta} = \theta$?

What is the reduction of the chi-square value when you move your parameter by $\pm 1 \sigma$?