Proton dE/dx resolutions

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- Some analytic points
- 1)It is best to analyze in slices of data in which the variation of the predicted dE/dx for protons is minimial. This means- avoid slices in dE/dx but use slices in momentum.
- 2)The measured variance of the dE/dx is then defined (assuming no bias in prediction)as

$$\sigma_f^{measured} = \sqrt{\left\langle (f - f^{predicted})^2 \right\rangle}$$

$$f \equiv \frac{dE}{dx}$$

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However, the predcited value for f is at a certain momentum which has an error. So in reality,

$$\sigma_f^{measured} = \sqrt{\sigma_{true}^2 + \left(\frac{df_{pred}}{dp}\right)^2 \sigma_p^{\,2}}$$

One needs to evaluate the true σ to see if it scales appropriately.

However, when one uses the sigma to calculates the likelihood, one needs to use the measured quantity, sicen the momentum error is present in the predicted width..