

KaonLT Meeting

July 16th, 2024

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Previous functional forms...

$$\sigma_L = (p_1 + p_2 \log Q^2) e^{p_3 | -t|}$$

$$\sigma_T = (p_5 \left(\frac{| -t|}{Q^2} - 1 \right)) e^{p_6 | -t|}$$

Separated Response Functions in
Exclusive, Forward π^\pm Electroproduction on Deuterium

[arXiv:1412.5140v1](https://arxiv.org/abs/1412.5140v1) [nucl-ex] 16 Dec 2014

[5.5]

$$\sigma_{LT} = g(W) \cdot (p_9 e^{p_{10} | -t|} + \frac{p_{11}}{| -t|}) \cdot \sin \theta_{CM}. \quad [5.6]$$

$$\sigma_{TT} = g(W) \cdot (f(t) \cdot \frac{p_{12}}{Q^2} e^{-Q^2}) \cdot \sin^2 \theta_{CM}, \quad [5.7]$$

New functional forms (based on Fpi)...

$$\sigma_L = p_1 \cdot Q_{F,L} \cdot t_{pole} \cdot e^{-p_6|-t|}$$

$$\sigma_T = p_5 \cdot Q_{F,T}^{p_6}$$

$$\sigma_{LT} = \frac{p_9}{1 + Q^2} \cdot e^{-p_{10}|-t|} \cdot \sin \theta_K$$

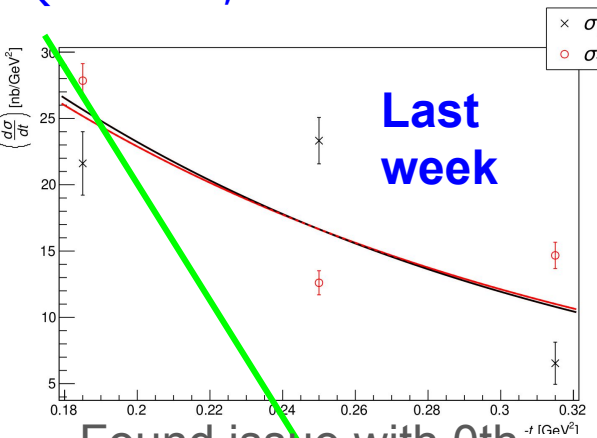
$$\sigma_{TT} = \frac{p_{13}}{(1 + Q^2)} \cdot e^{-p_{10}|-t|} \cdot \sin^2 \theta_K$$

$$Q_{F,L} = \frac{Q^2}{1 + 1.77Q^2 + 0.12(Q^2)^2}$$

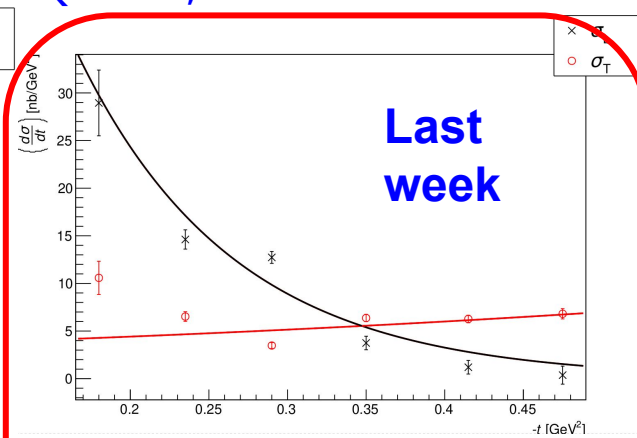
$$t_{pole} = \frac{|-t|}{(|-t| + m_K^2)^2}$$

$$Q_{F,T} = \frac{e^{-(Q^2)^2}}{Q^2}$$

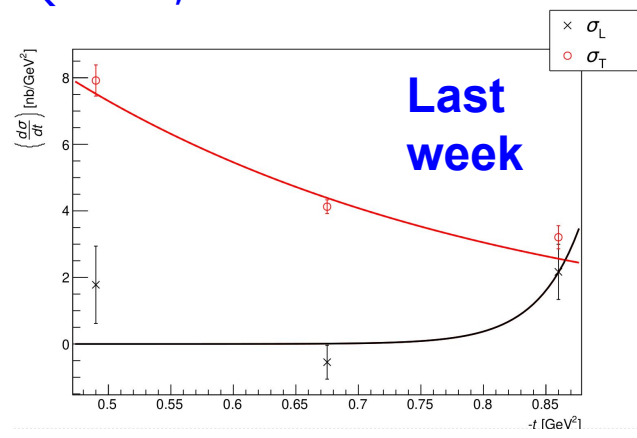
$Q^2=2.115, W=2.95$



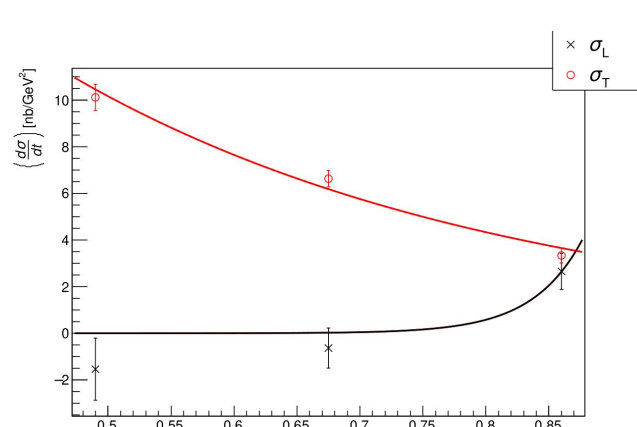
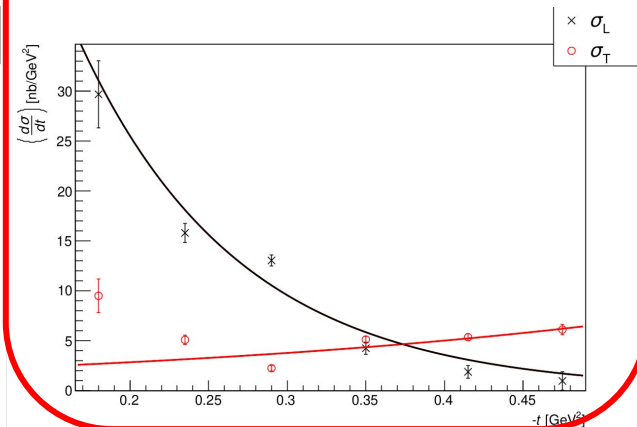
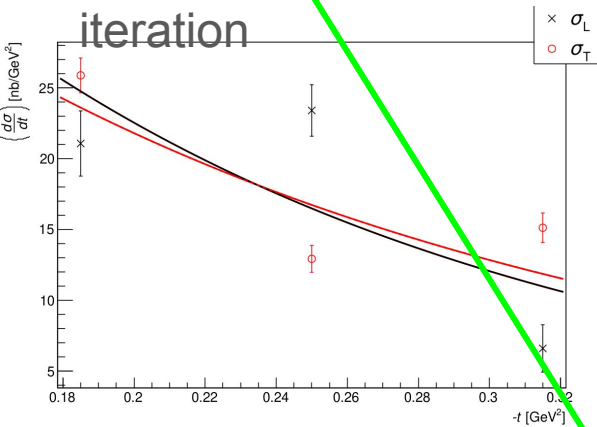
$Q^2=3.0, W=3.14$



$Q^2=5.5, W=3.02$



Found issue with 0th iteration

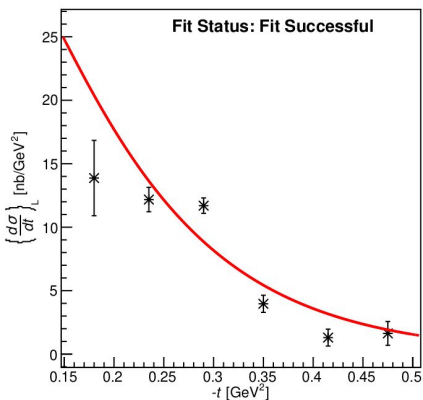


****j=1

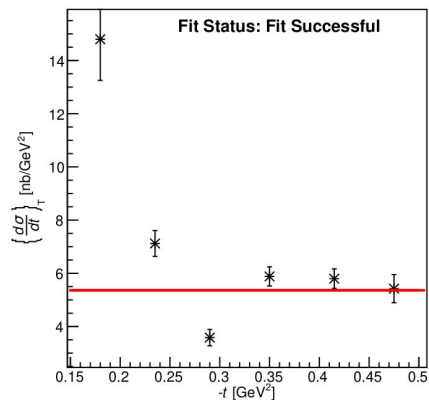
Best statistics by order of mag

$i=1$ $Q^2=3.0, W=3.14$ $Q^2=5.5, W=3.02$

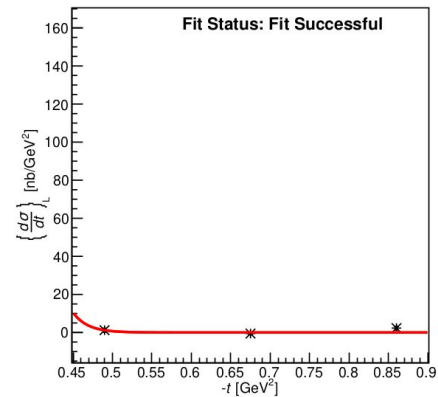
Sigma L Model Fit



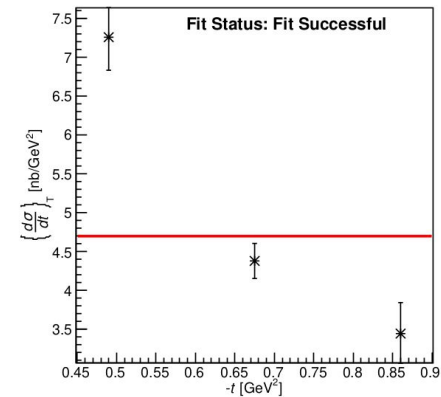
Sigma T Model Fit



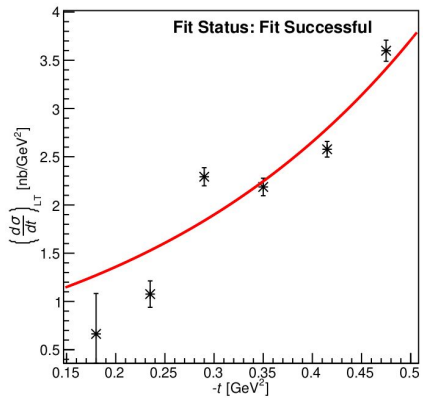
Sigma L Model Fit



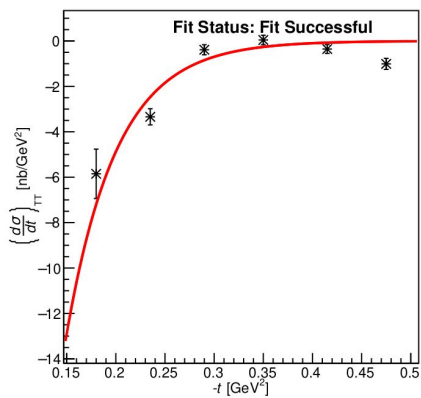
Sigma T Model Fit



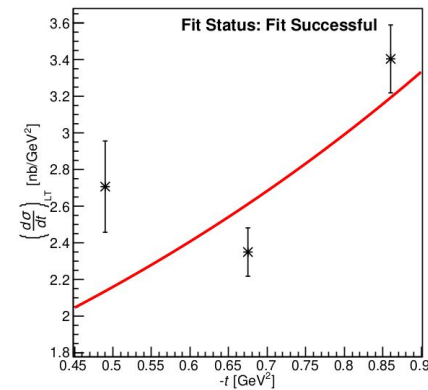
Sigma LT Model Fit



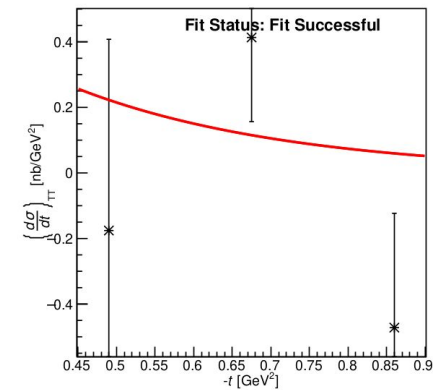
Sigma TT Model Fit

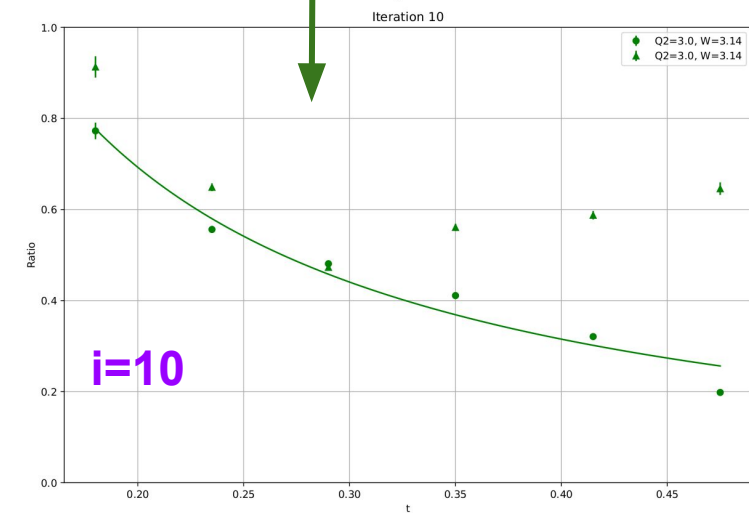
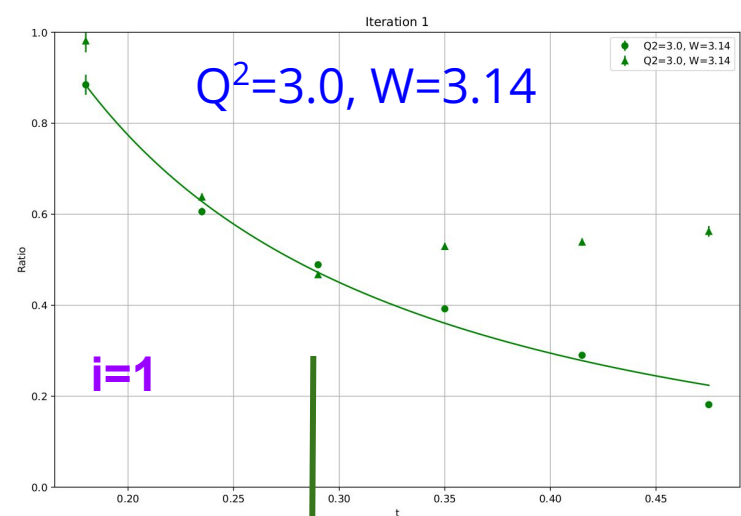


Sigma LT Model Fit



Sigma TT Model Fit





$$\sigma_L = p_1 \cdot Q_{F,L} \cdot t_{pole} \cdot e^{-p_6|-t|}$$

$$\sigma_T = p_5 \cdot Q_{F,T}^{p_6}$$

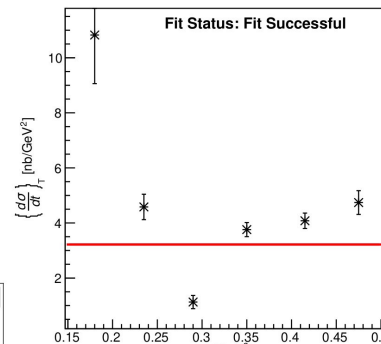
$$\sigma_{LT} = \frac{p_9}{1 + Q^2} \cdot e^{-p_{10}|-t|} \cdot \sin \theta_K$$

$Q^2=3.0$ does start to flatten out but there is still a $|-t|$ dependence

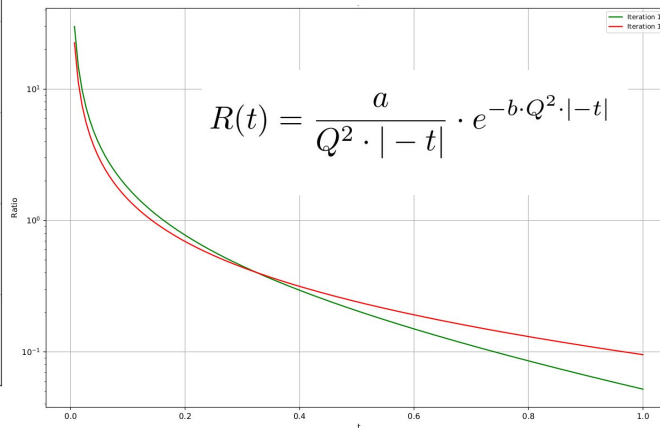
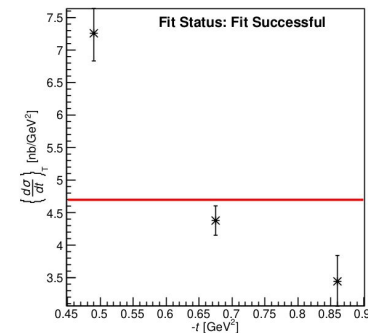
Introduce a $|-t|$ dependence?

- $\exp(-p_7|-t|)$
- $(p_7-|-t|)$

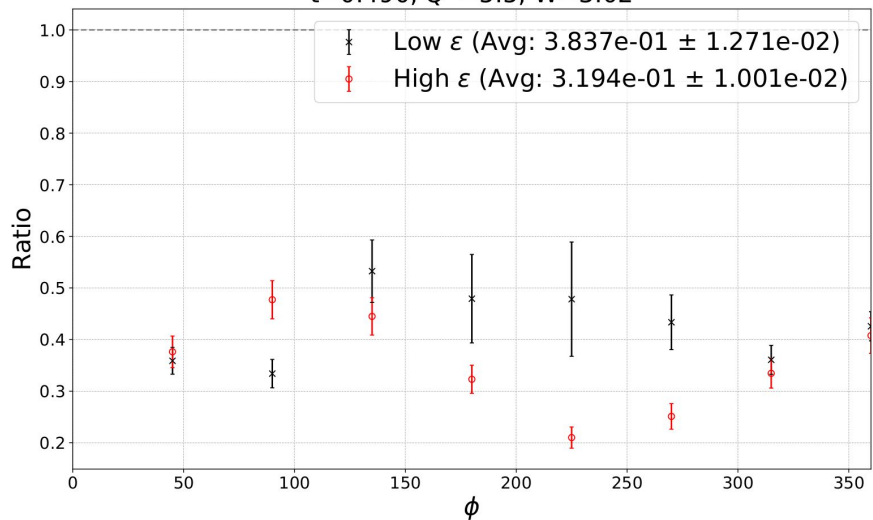
Sigma T Model Fit



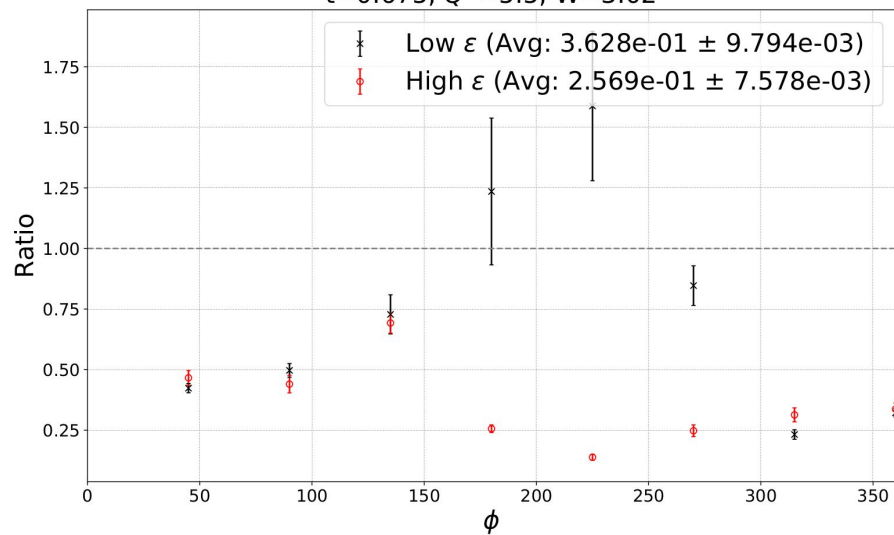
Sigma T Model Fit



$t=0.490, Q^2=5.5, W=3.02$



$t=0.675, Q^2=5.5, W=3.02$



$t=0.860, Q^2=5.5, W=3.02$

