KaonLT Meeting

June 6th, 2024

Richard Trotta

$$\sigma_L = g(W) \cdot (\mathrm{p1} + \mathrm{p2} \log Q^2) e^{(\mathrm{p3} + \mathrm{p4} \log Q^2) \cdot |-t|}, \quad [5.4]$$

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

t-avg for all Q^2

$$\sigma_T = g(W) \cdot [p5 + p6 \cdot \log Q^2 + (p7 + p8 \cdot \log Q^2) \cdot \frac{|-t| - (0.1112 + 0.0066 \cdot \log Q^2) \cdot Q^2}{(0.1112 + 0.0066 \cdot \log Q^2) \cdot Q^2}], \quad [5.5]$$

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

Separated Response Functions in
Exclusive, Forward $\pi^{\pm}$ Electroproduction on Deuterium

arXiv:1412.5140v1 [nucl-ex] 16 Dec 2014

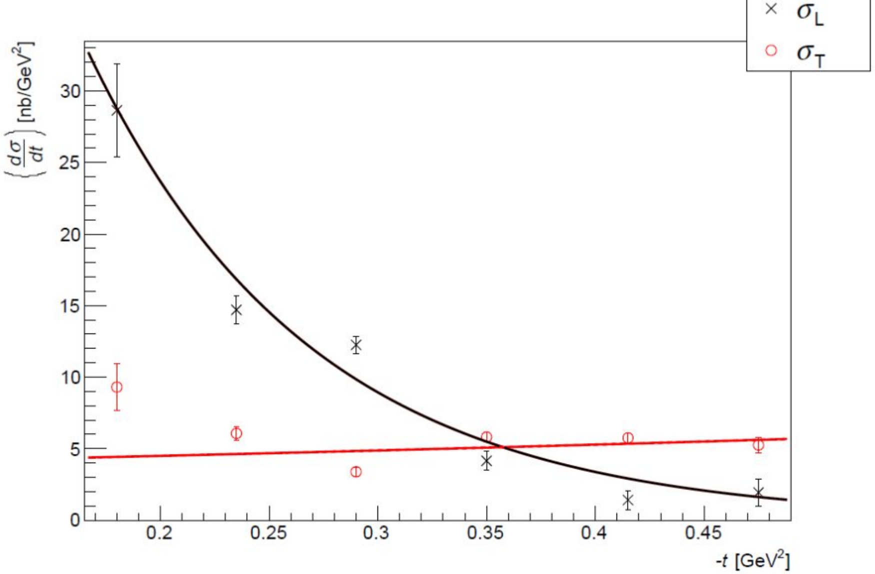
$$\sigma_{\mathrm{LT}} = g(W) \cdot (\mathrm{p9} e^{\mathrm{p10} \cdot |-t|} + \frac{\mathrm{p11}}{|-t|}) \cdot \sin \theta_{CM}. \quad [5.6]$$

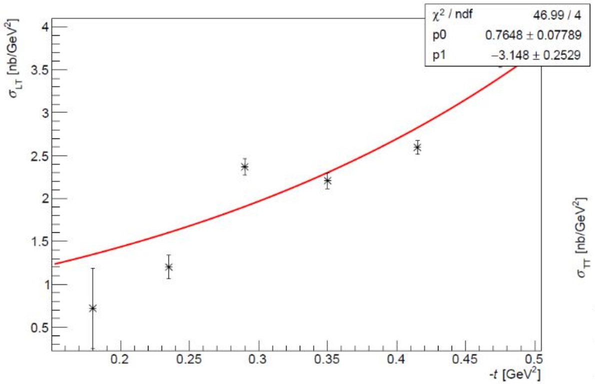
$$\sigma_{\mathrm{TT}} = g(W) \cdot (f(t) \cdot \frac{\mathrm{p12}}{Q^2} e^{-Q^2}) \cdot \sin^2 \theta_{CM}, \quad [5.7]$$

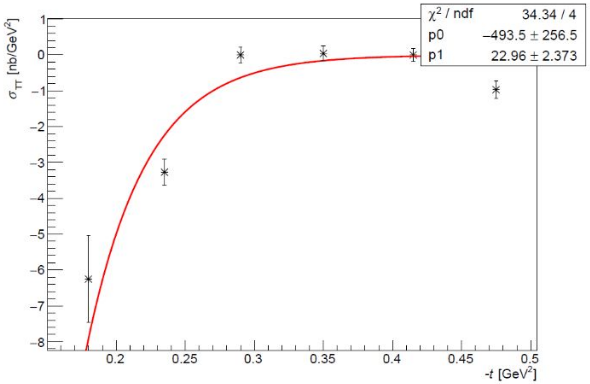
Q^2=3.0, W=3.14

t=0.15-0.5

17 iterations







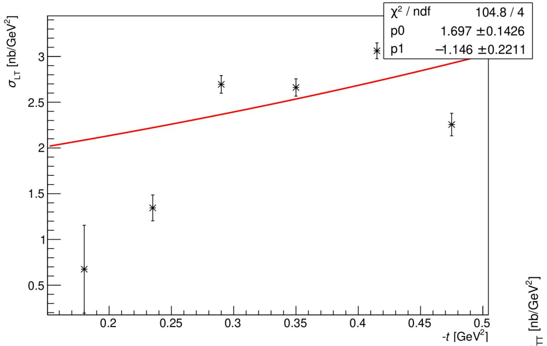
$$\sigma_L = g(W) \cdot (\mathrm{p1} + \mathrm{p2} \log Q^2) e^{(\mathrm{p3}+\mathrm{p4}\log Q^2)\cdot|-t|}, \quad [5.4]$$

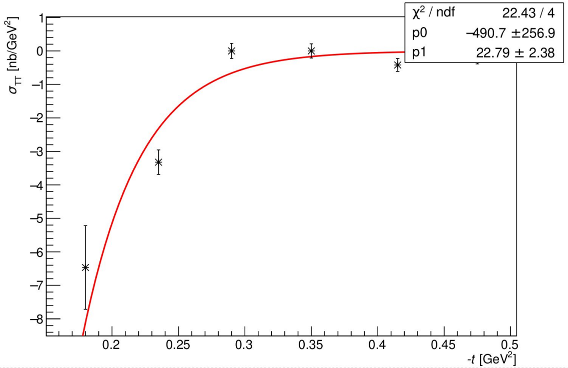
$$\sigma_T = g(W) \cdot [p5 + p6 \cdot \log Q^2 + (p7 + p8 \cdot \log Q^2) \cdot \frac{|-t| - (0.1112 + 0.0066 \cdot \log Q^2) \cdot Q^2}{(0.1112 + 0.0066 \cdot \log Q^2) \cdot Q^2}], \quad [5.5]$$

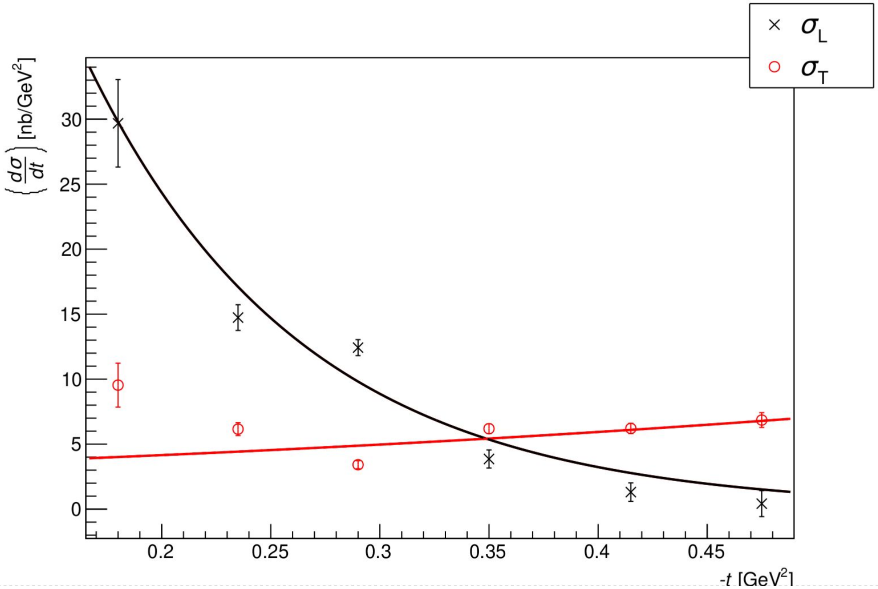
Q^2=3.0, W=3.14

t=0.15-0.5

***1 iterations







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

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

Q^2=3.0, W=3.14

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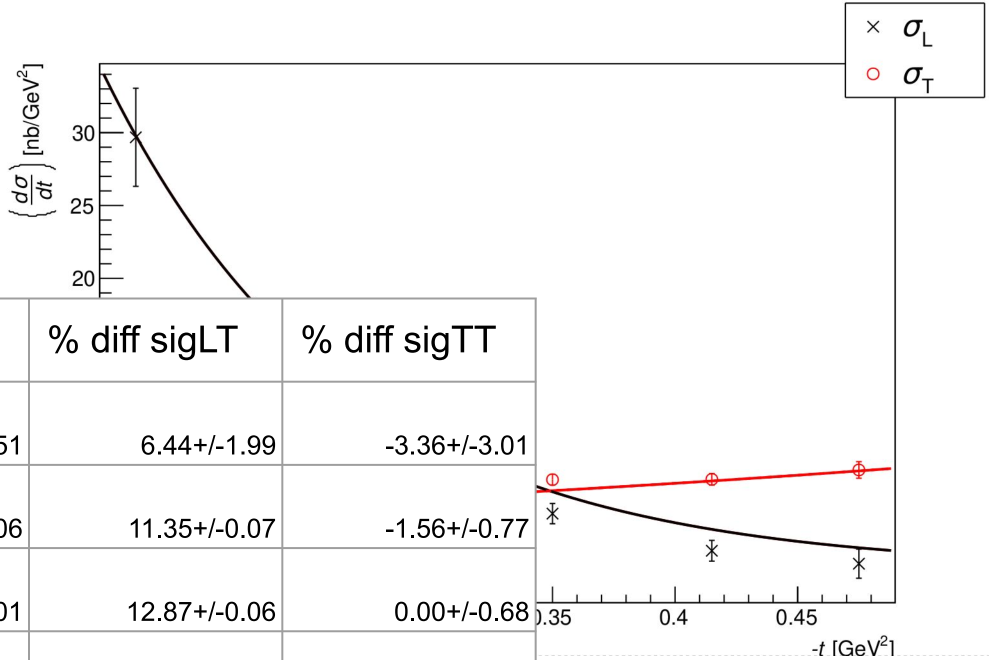
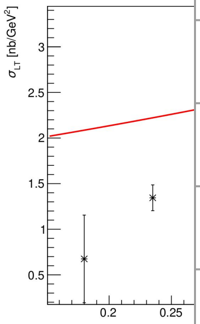
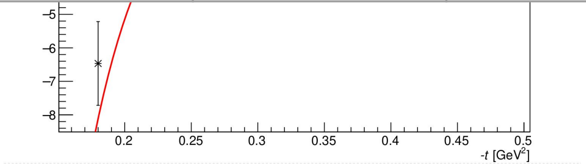
***1 iterations**





t-bin	% diff sigL	% diff sigT	% diff sigLT	% diff sigTT
1	3.55+/-0.33	2.49+/-0.51	6.44+/-1.99	-3.36+/-3.01
2	0.23+/-0.04	1.49+/-0.06	11.35+/-0.07	-1.56+/-0.77
3	1.36+/-0.01	0.82+/-0.01	12.87+/-0.06	0.00+/-0.68
4	7.36+/-0.50	6.31+/-0.19	18.63+/-0.13	3.49+/-0.82
5	7.58+/-3.35	7.63+/-0.44	16.48+/-0.19	-4.2+/-1.19
6	128.63+/-4.36	26.42+/-0.61	46.86+/-0.41	-161.82+/-15.77



Pt-to-pt

Point-to-point uncertainties, also known as random or uncorrelated uncertainties, affect each epsilon setting independently.

- Acceptance - To address the acceptance uncertainty, geometric constraints are altered by varying acceptance cuts to explore the impact of detector acceptance on the measured cross section.
  - Ali
  - Nacer (3p8/4p9)
  - Detector geometry
  - Acceptance cuts
- PID - PID uncertainty is evaluated by comparing high and low epsilon cuts. The effect of different PID strategies are examined, particularly scrutinizing variations between stringent and lenient identification criteria for particles, on the cross section.
  - Richard
  - **New**, mainly for HGCer
  - Hgcer
- Tracking Efficiency - Tracking uncertainty is tackled by exploring the performance of different tracking algorithms
  - Ali
- Kinematics - Kinematics uncertainty is studies by systematically varying experimental parameters related to the kinematics of the reaction. This involved adjusting scattering angle, particle momentum, and beam energy to discern the impact of these factors on the observed cross sections.
  - Ali
  - Nacer (3p8/4p9)
  - Offsets
- Radiative Corrections - Radiative uncertainty is quantified first through SIMC simulations conducted with and without the radiative flag to get an idea of how large of an effect it has. This can then be used in conjunction with comparative cuts that remove radiative tails to get the radiative uncertainty.
  - SIMC simulations conducted with and without the radiative flag
  - Varying MM cut
  - Varies by process
  - Pion, Vijay
  - Kaon, Richard
- Monte Carlo Model - Monte Carlo simulation uncertainty is addressed by varying the input model.
  - Probably use kaon since more model sensitive
  - Richard