KaonLT Meeting

May 2nd, 2024

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Q^2=3.0, W=3.14 Parameterization done in region t-range=0.1-0.3 for center only!

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

t-avg for all Q^2

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

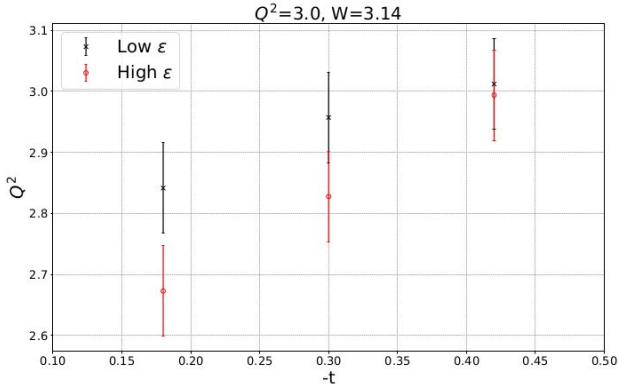
Separated Response Functions in
Exclusive, Forward $\pi^{\pm}$ Electroproduction on Deuterium

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

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

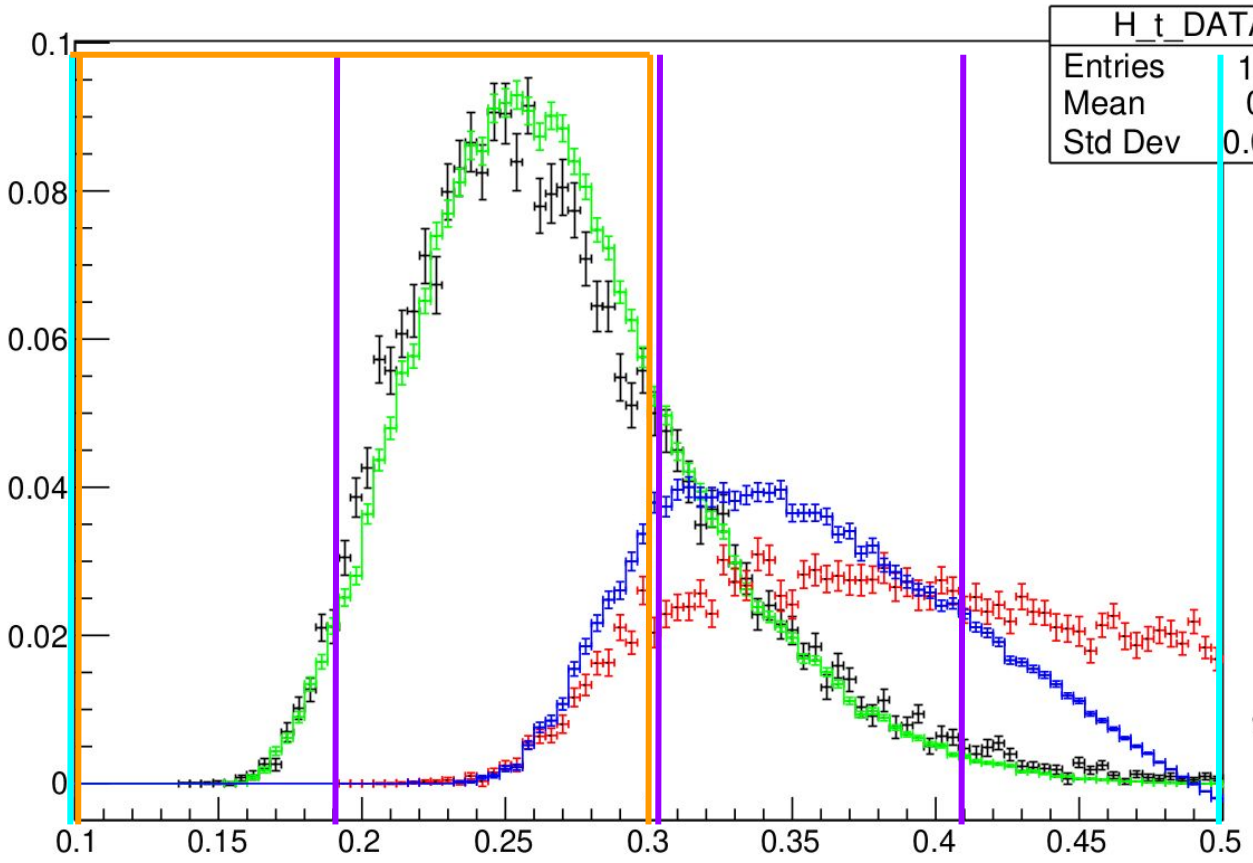
$$\sigma_{\mathrm{TT}} = g(W) \cdot (f(t) \cdot \frac{\mathrm{p12}}{Q^2} e^{-Q^2}) \cdot \sin^2 \theta_{CM}, \quad [5.7]$$

- Doing 2D (Q^2,t) fits was too difficult to iterate
- Only when **generating new parameters** during iterations, Q^2 term is fixed at 3.0



Q^2=3.0, W=3.14 Parameterization done in region t-range=0.1-0.3 for center only!

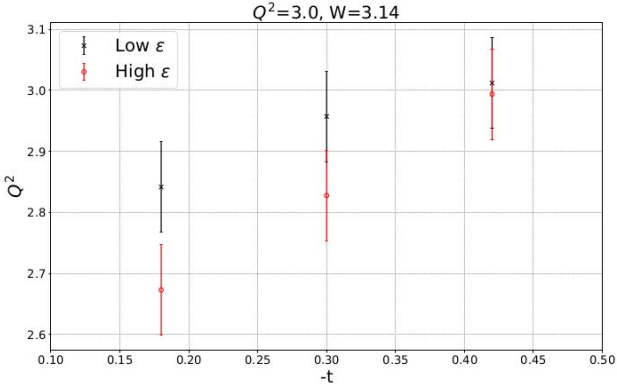
17 iterations



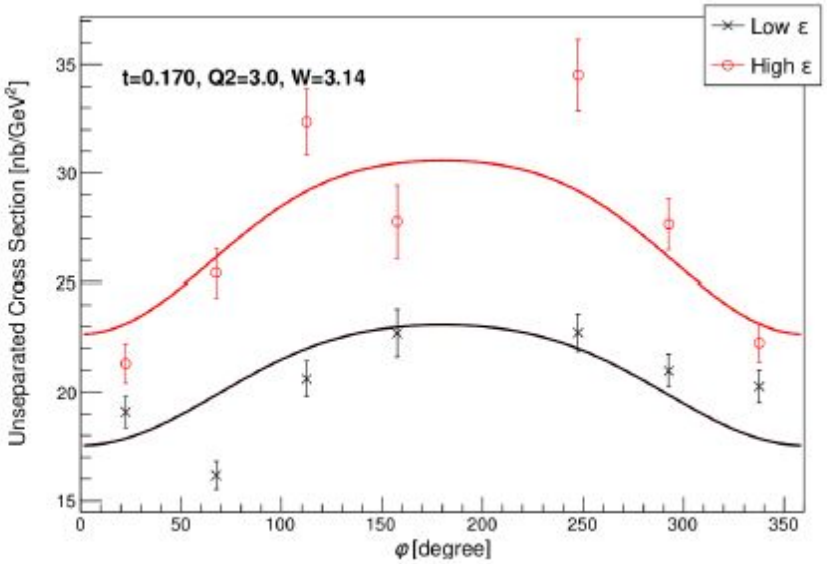
Bins

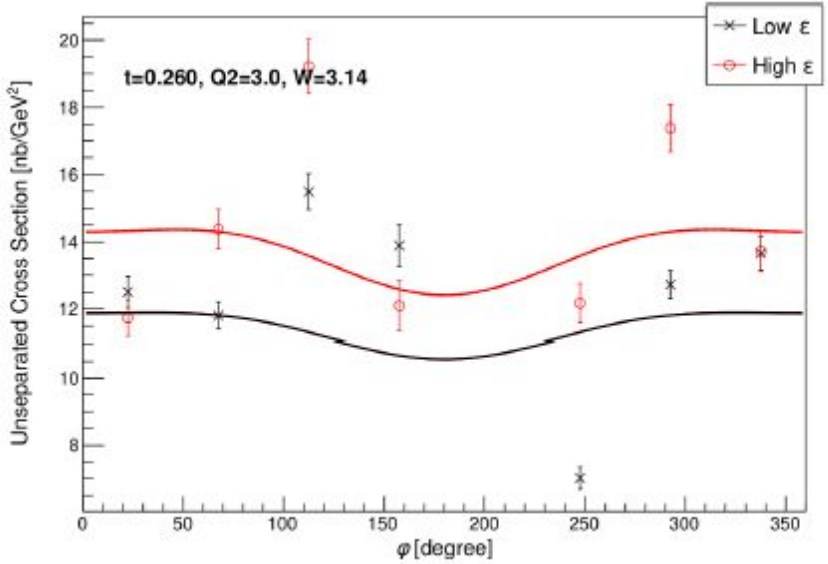
t-range

t-range for parameterization

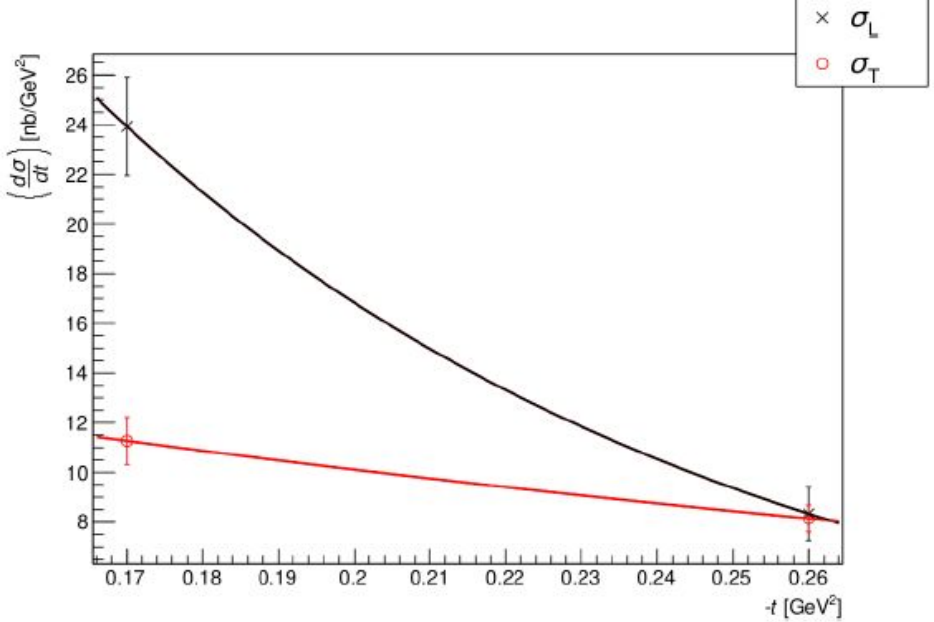


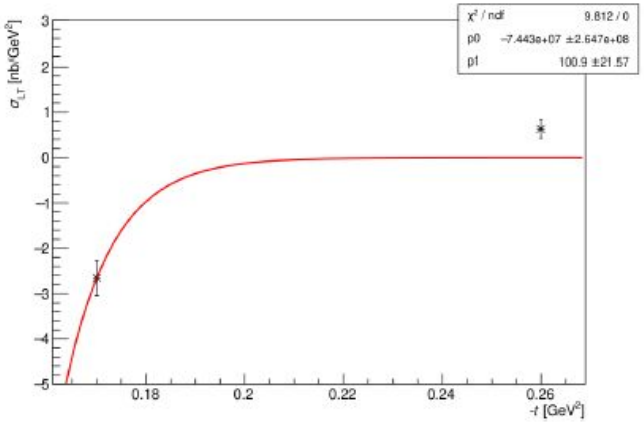
Q^2=3.0, W=3.14

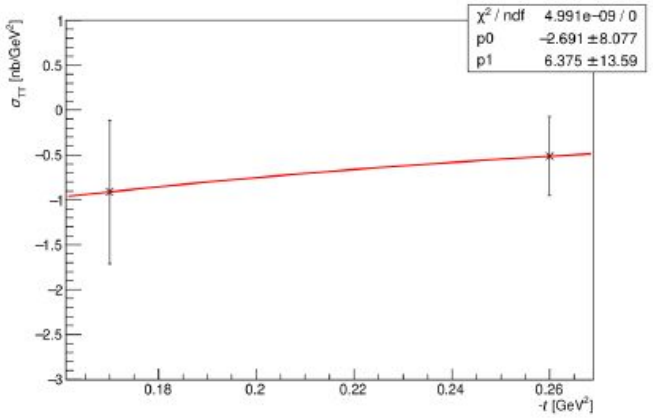

t=0.170, Q2=3.0, W=3.14
Low ε
High ε
Unseparated Cross Section [nb/GeV²]
φ [degree]


t=0.260, Q2=3.0, W=3.14
Low ε
High ε
Unseparated Cross Section [nb/GeV²]
φ [degree]

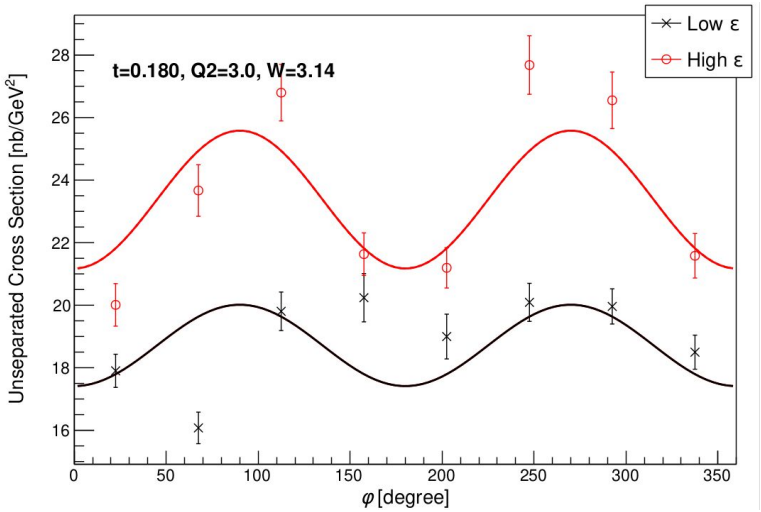
Q^2=3.0, W=3.14

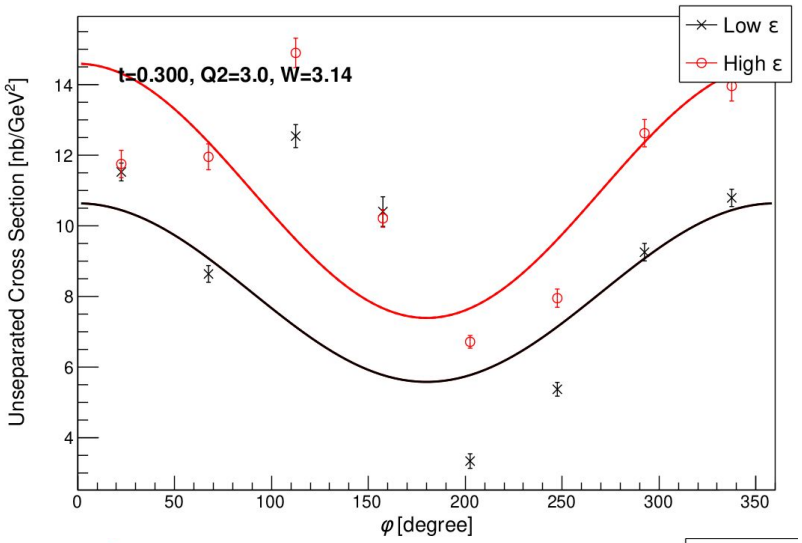

σ_L
σ_T
$\left(\frac{d\sigma}{dt}\right)$ [nb/GeV^2]
-t [GeV^2]

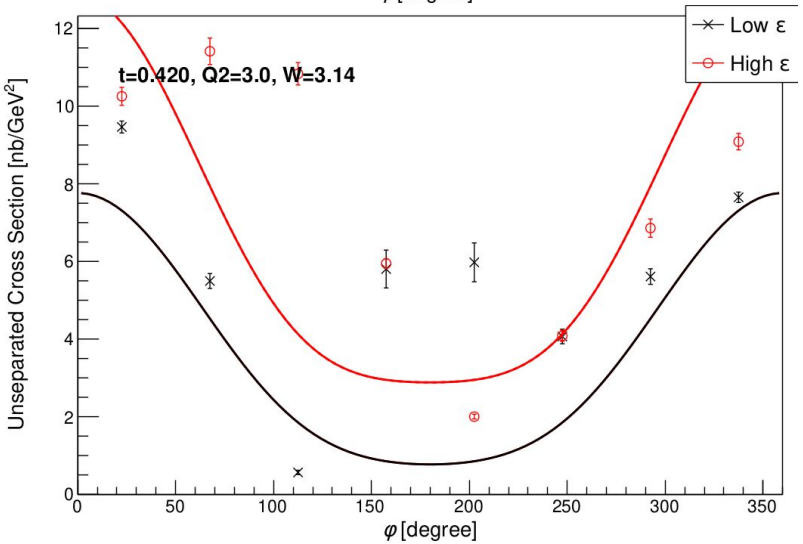

χ^2 / ndf 9.812 / 0
p0 −7.443e+07 ±2.647e+08
p1 100.9 ±21.57
σ_{LT} [nb/GeV^2]
-t [GeV^2]


χ^2 / ndf 4.991e−09 / 0
p0 −2.691 ±8.077
p1 6.375 ±13.59
σ_{TT} [nb/GeV^2]
-t [GeV^2]

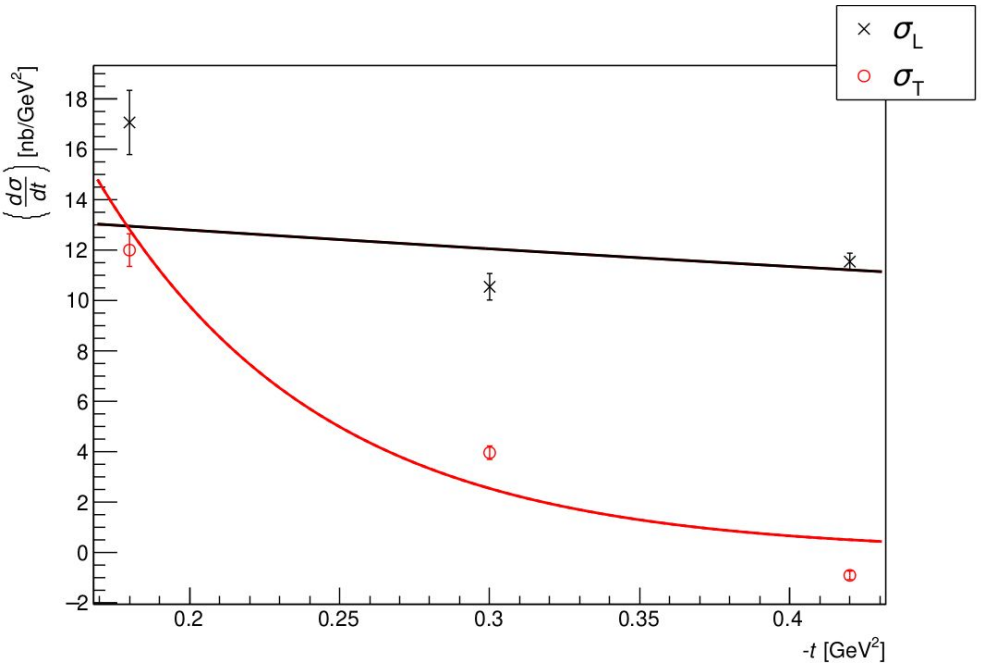
Q^2=3.0, W=3.14

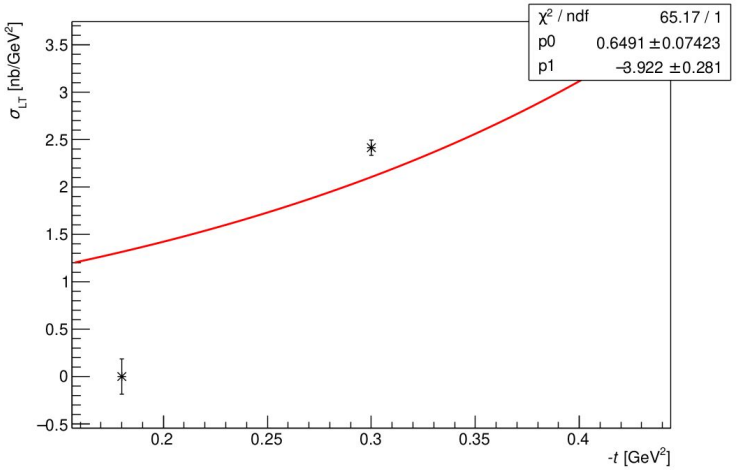

t=0.180, Q2=3.0, W=3.14
Low ε
High ε
Unseparated Cross Section [nb/GeV²]
φ [degree]

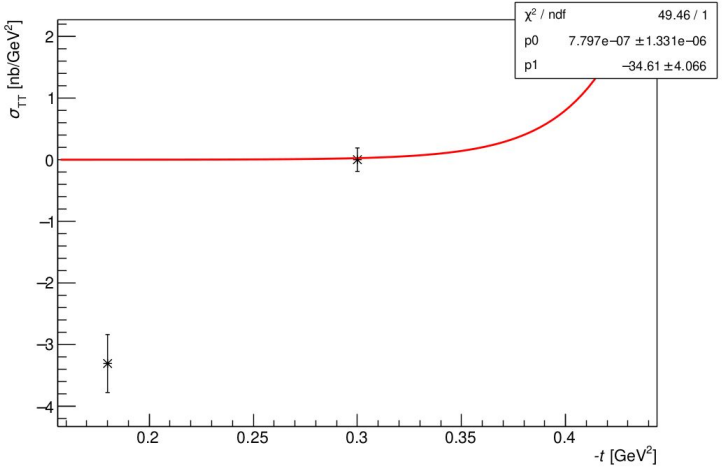

t=0.300, Q2=3.0, W=3.14
Low ε
High ε
Unseparated Cross Section [nb/GeV²]
φ [degree]


t=0.420, Q2=3.0, W=3.14
Low ε
High ε
Unseparated Cross Section [nb/GeV²]
φ [degree]

Q^2=3.0, W=3.14


σ_L
σ_T
$\left\langle \frac{d\sigma}{dt} \right\rangle$ [nb/GeV^2]
-t [GeV^2]


χ^2 / ndf 65.17 / 1
p0 0.6491 ±0.07423
p1 −3.922 ±0.281
σ_{LT} [nb/GeV^2]
-t [GeV^2]


χ^2 / ndf 49.46 / 1
p0 7.797e−07 ±1.331e−06
p1 −34.61 ±4.066
σ_{TT} [nb/GeV^2]
-t [GeV^2]