KaonLTMeeting

March 7th, 2024

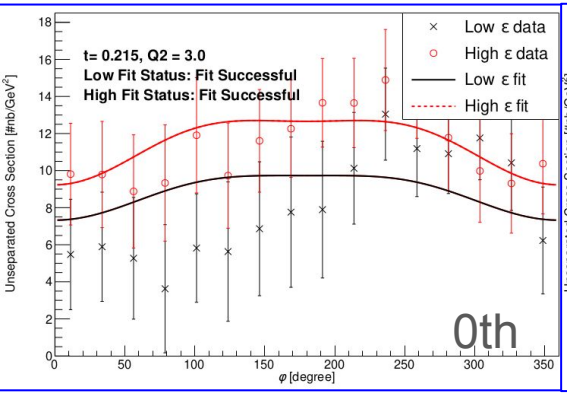
Richard Trotta

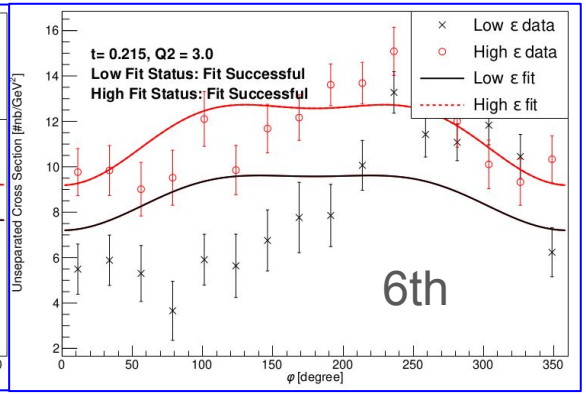
Overview

1. **Fix to xsect uncertainty**
2. **π-subtraction**
3. **π-subtraction xsect comparison**
4. **xsect issues**

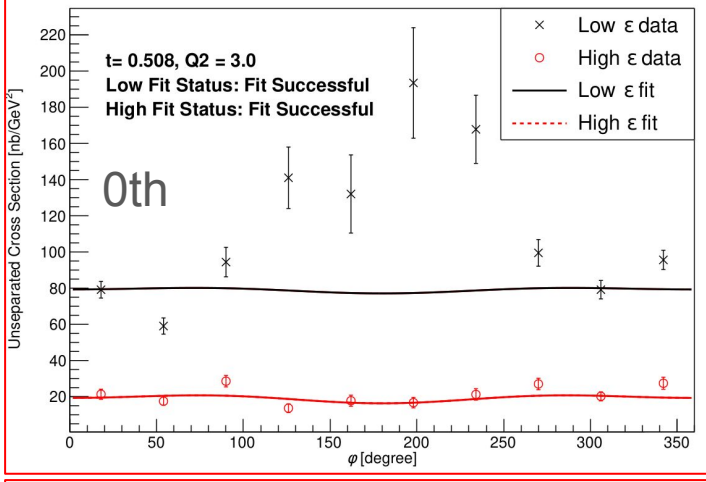
1) Fix to xsect uncertainty

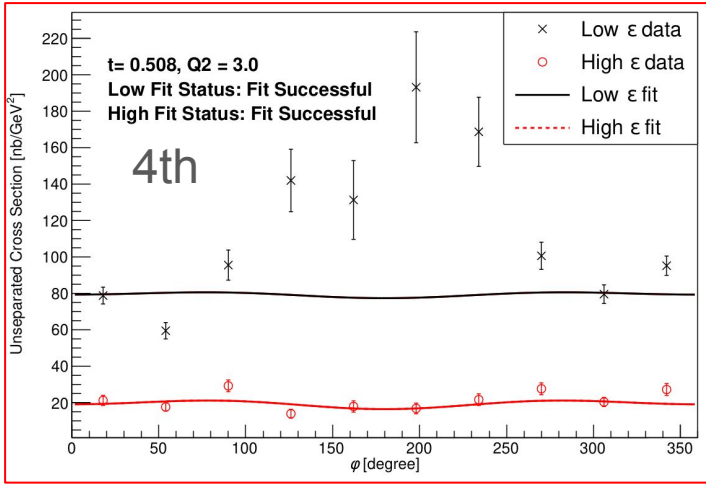
- Last week I showed issue with uncertainties on iterations behaving as expected for ratios but shrinking for xsects
- Met with Ali and Garth, it was a simple fix
- I was using absolute error but treating as a relative error





Last week



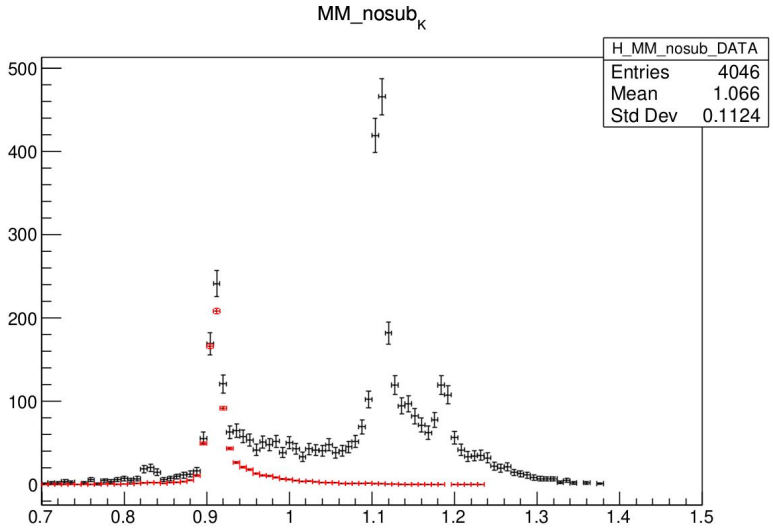


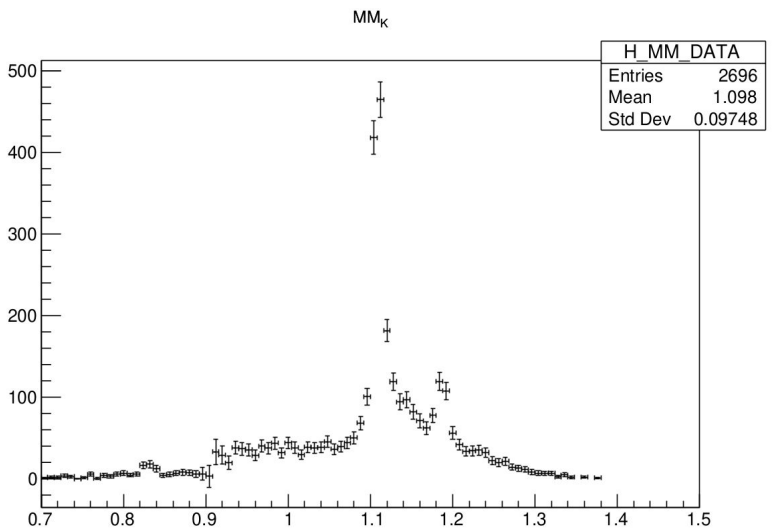
Fixed errors

*** Different Q2/W settings, just for error comparison

2) π-subtraction

- Implimented π-subtraction for Q^2=2.115 and both Q^2=3.0 settings
- Added proper scaling to all pion peaks





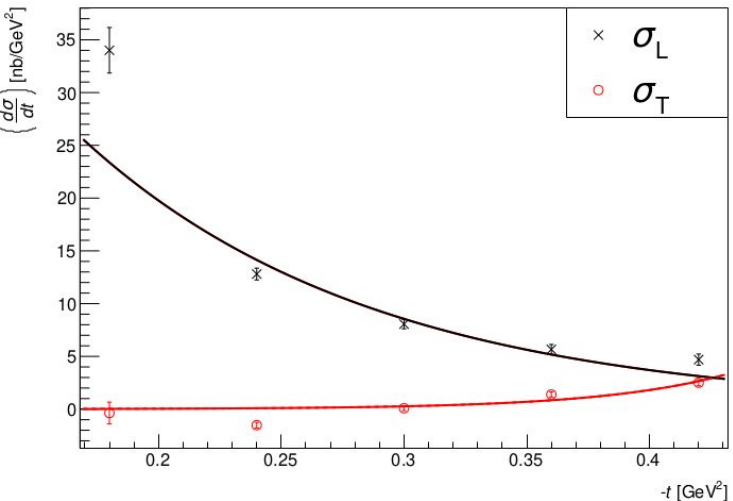
Q^2=3.0, W=3.14, high eps, center

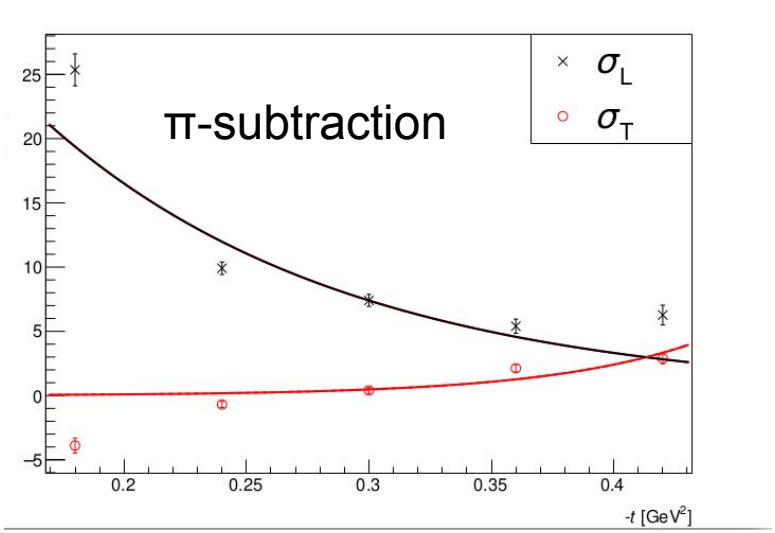
3) π-subtraction xsect comparison

**Iterations still work in progress

- Small drop in xsect as you get to lower -t
- Otherwise fairly consistent values with and without π-subtraction

Q^2=3.0, W=3.14



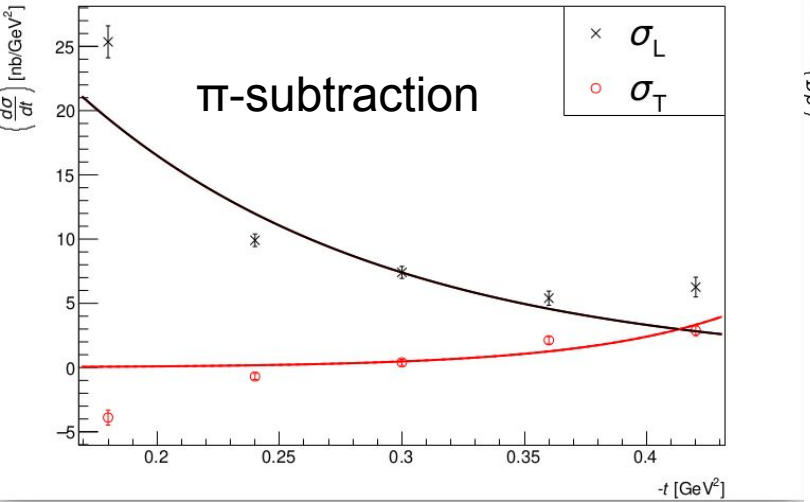


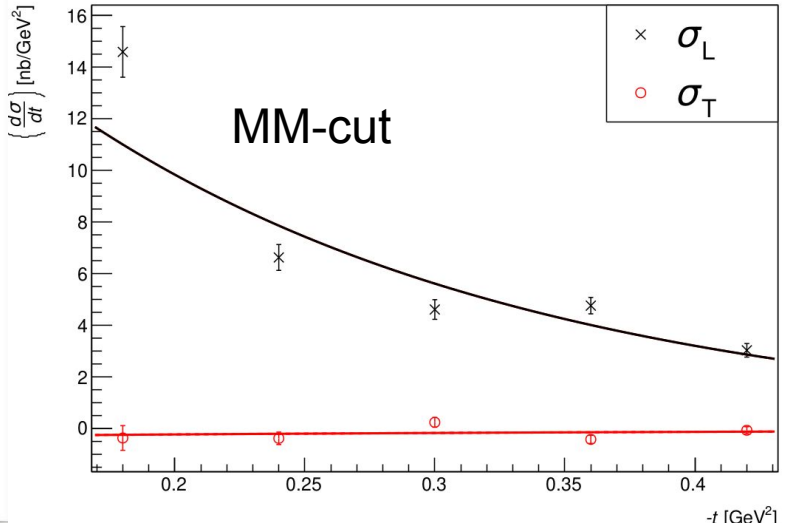
3) π-subtraction xsect comparison

**Iterations still work in progress

- 1.10 < MM < 1.18
- MM cut sees a larger drop in xsect, but for higher -t this is only a few nb/GeV^2

Q^2=3.0, W=3.14





4) xsect issues

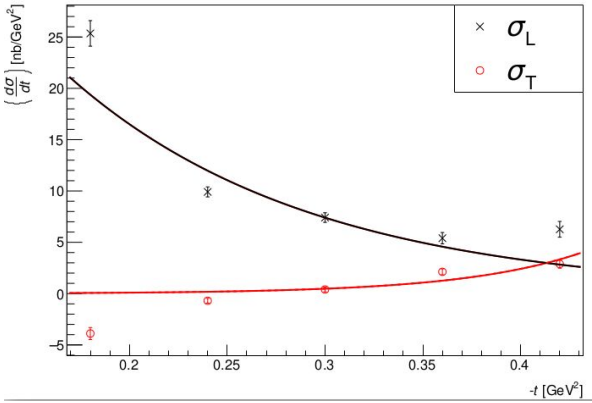
**Iterations still work in progress

- Q2=3.0, W=2.32: sigL is negative ($\varepsilon_{Low} > \varepsilon_{High}$)
- Q2=3.0, W=3.14: sigT is too small
- Q2=2.115, W=2.95: Somewhere in between

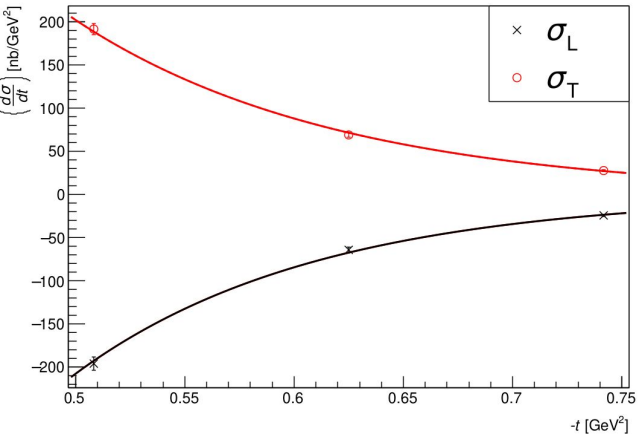
$$\sigma_L = g(W) \cdot (\mathrm{p1} + \mathrm{p2} \log Q^2) e^{(\mathrm{p3}+\mathrm{p4} \log Q^2) \cdot (-t+0.2)}$$

$$\sigma_T = g(W) \cdot \left(\frac{\mathrm{p5}}{1 + \mathrm{p6} \cdot Q^2}\right)$$

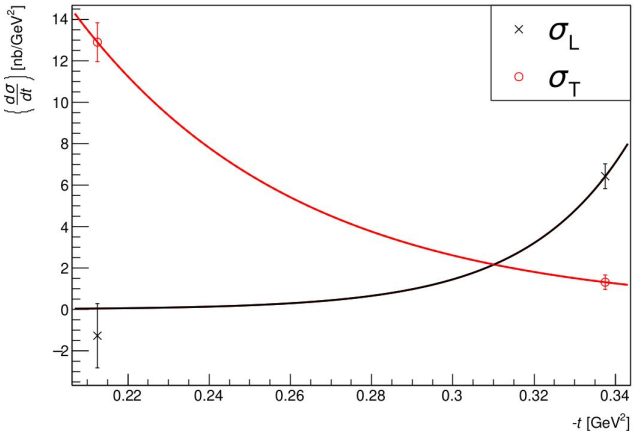
Q^2=3.0, W=3.14



Q^2=3.0, W=2.32



Q^2=2.115, W=2.95

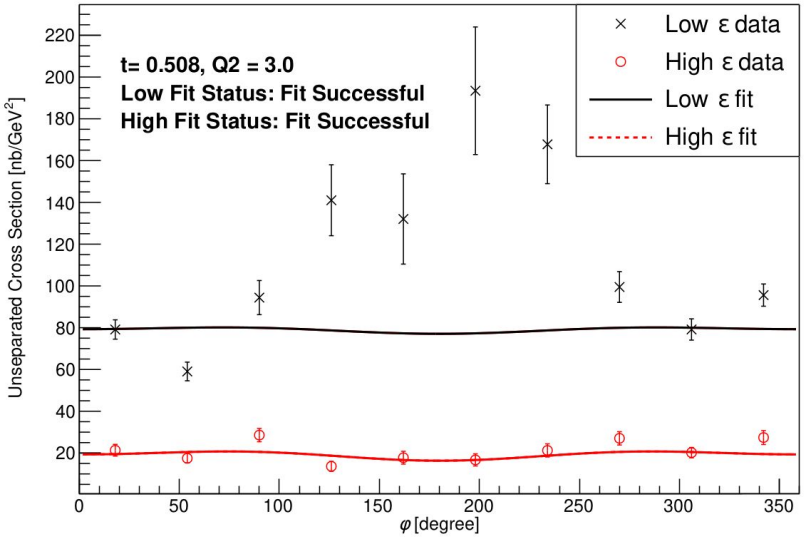


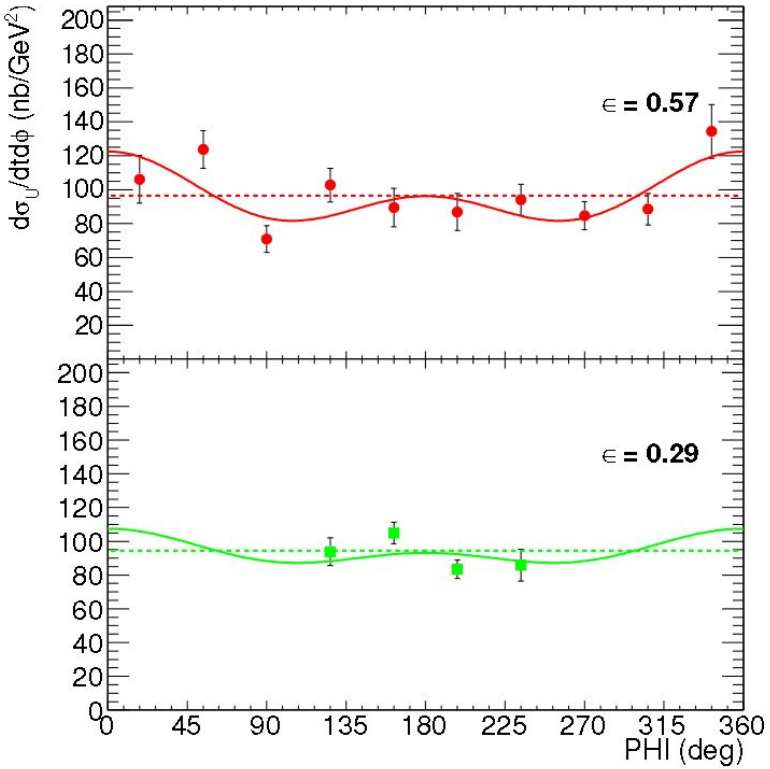
4) xsect issues

- Comparing to Marco's thesis for similar kinematics..
  - For like epsilon's about an order of magnitude difference

Q^2=3.0, W=2.32

ε_{Low}=0.57,ε_{High}=0.88





Marco Carmignotto's thesis

Fpi2:

Q^2=2.07, W=2.31