

# KaonLT Meeting

August 7<sup>th</sup>, 2025

Richard L. Trotta

Constants:

$$\pi, \quad m_{\text{tar}} = 0.93827231, \quad m_{\pi^+} = 0.139570, \quad m_{K^+} = 0.493677$$

$$t_{\text{av}} = (0.05032 + 0.01345 \ln Q_{\text{set}}^2) Q_{\text{set}}^2,$$

$$f_{t_{\text{av}}} = \frac{|t| - t_{\text{av}}}{t_{\text{av}}},$$

$$f_t = \frac{|t|}{(|t| + m_{K^+}^2)^2},$$

$$\sigma_L = (p_1 f_t) \exp(-|p_2 t|),$$

$$\sigma_T = \frac{p_5}{|t|^{p_6}} \exp(-|p_7 t|),$$

$$\sigma_{LT} = \frac{p_9}{|t|},$$

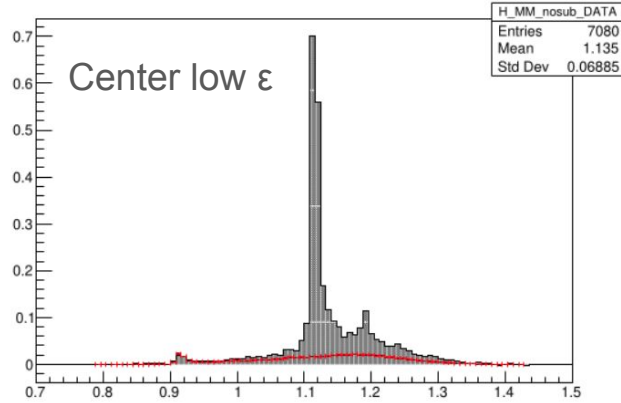
$$\sigma_{TT} = \frac{p_{13}}{|t|^{p_{14}}} \exp(-|p_{15} t|),$$

$$w_{\text{factor}} = \frac{1}{(W^2 - m_{\text{tar}}^2)^{0.85} W_{\text{set}}^2 - 5.97 W_{\text{set}} + 12.68}.$$

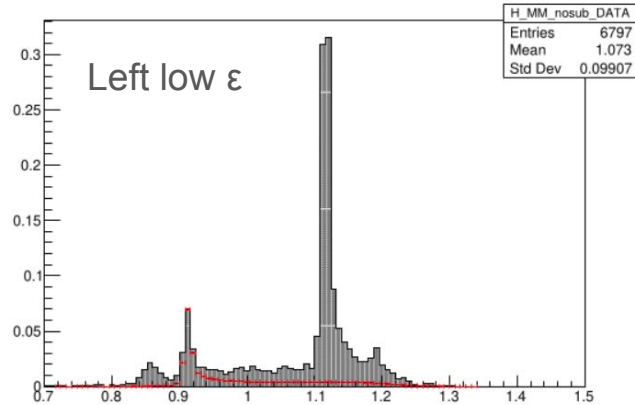
- Using same parameterization for all
  - Parameterization from 15 iterations shown 6/26/25 (all  $\phi$  settings)

$$Q^2=4.4, W=2.74 \mid 1.10 \leq M_K \leq 1.14, 0.88 \leq M_\pi \leq 0.94$$

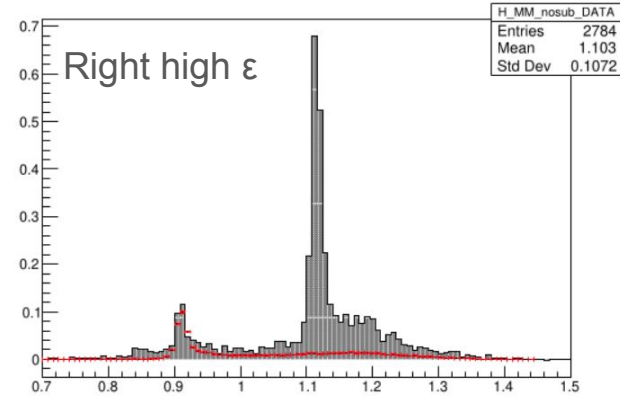
MM\_nosub\_K



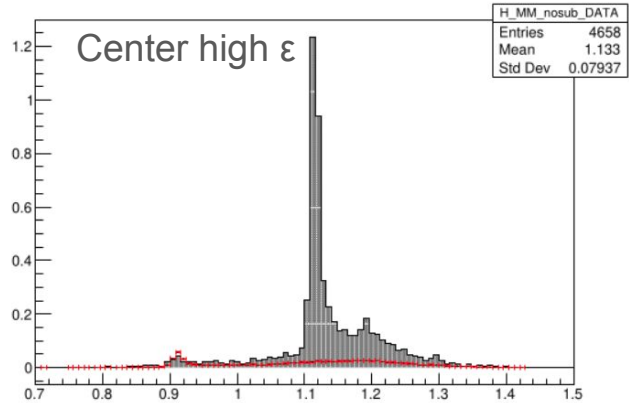
MM\_nosub\_K



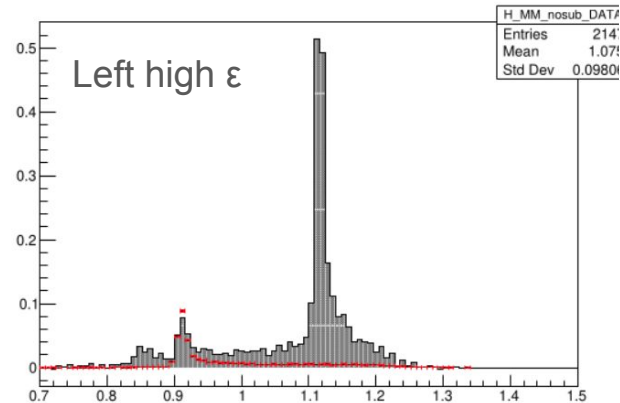
MM\_nosub\_K



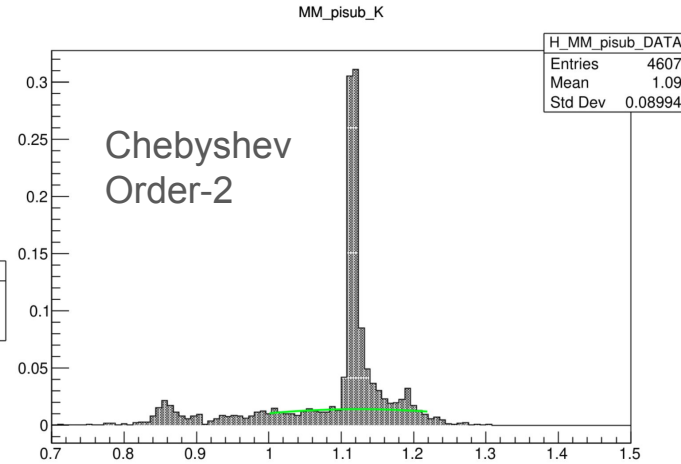
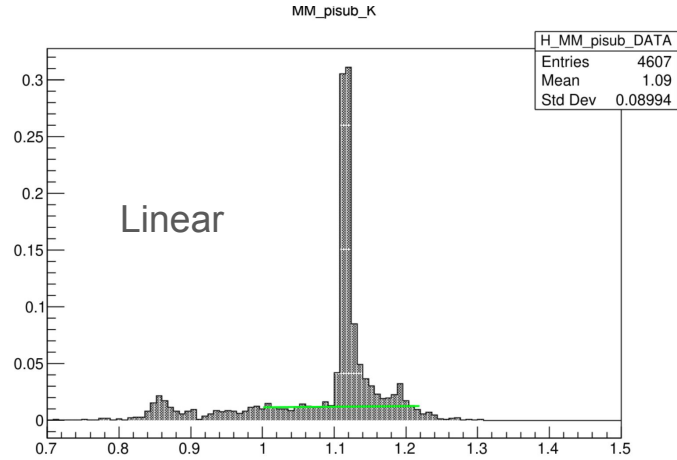
MM\_nosub\_K



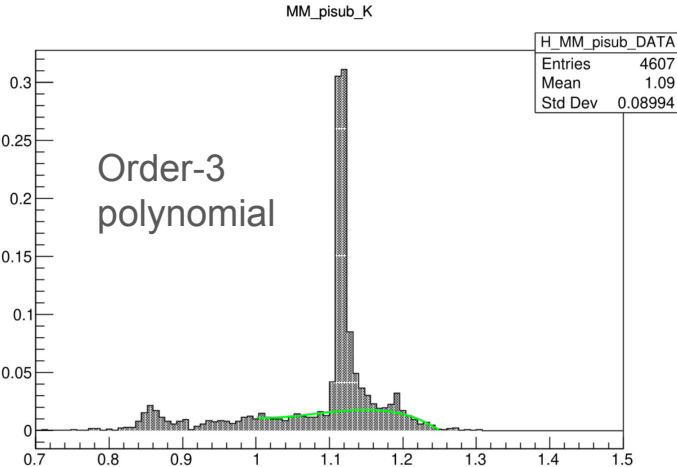
MM\_nosub\_K



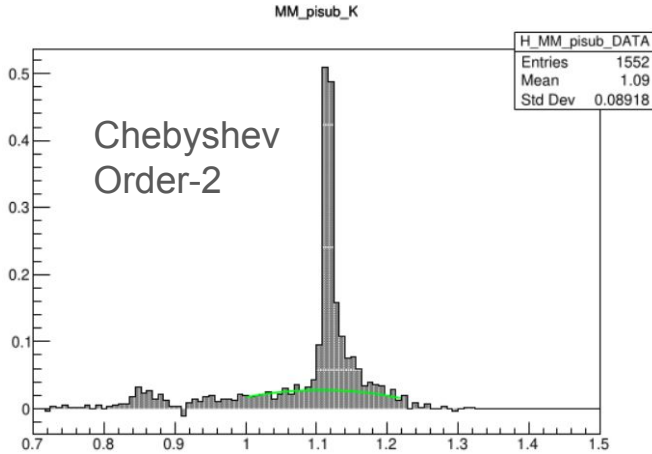
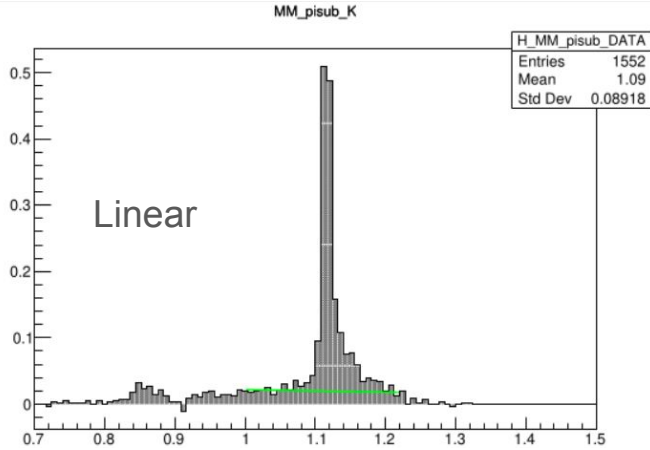
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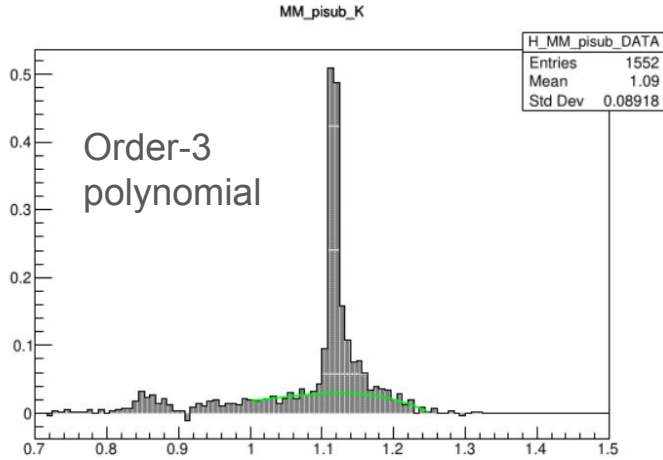
Left low  $\epsilon$



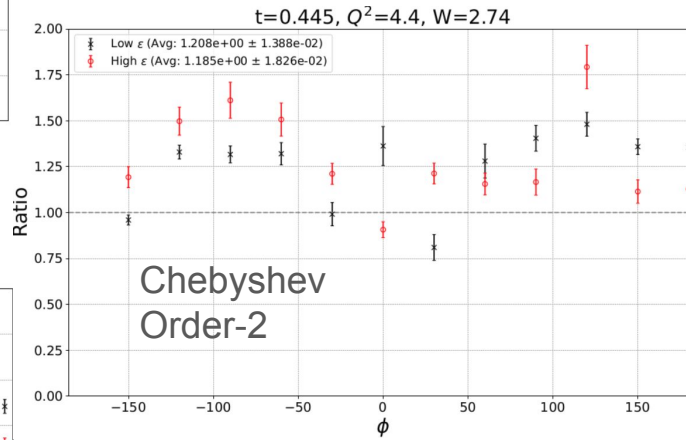
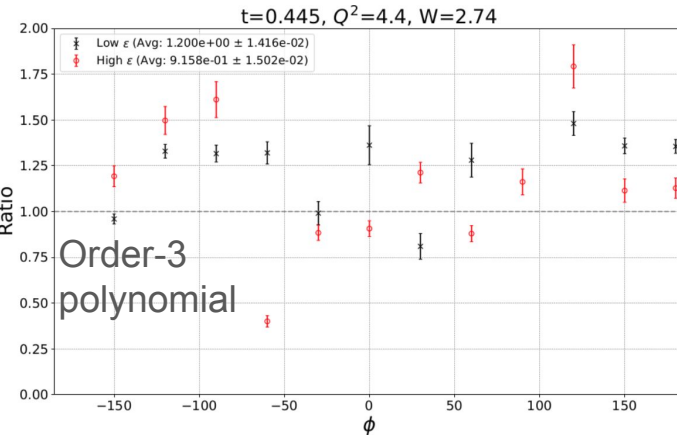
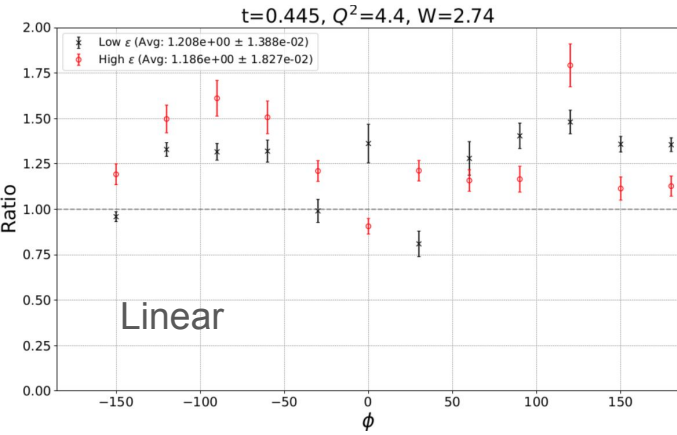
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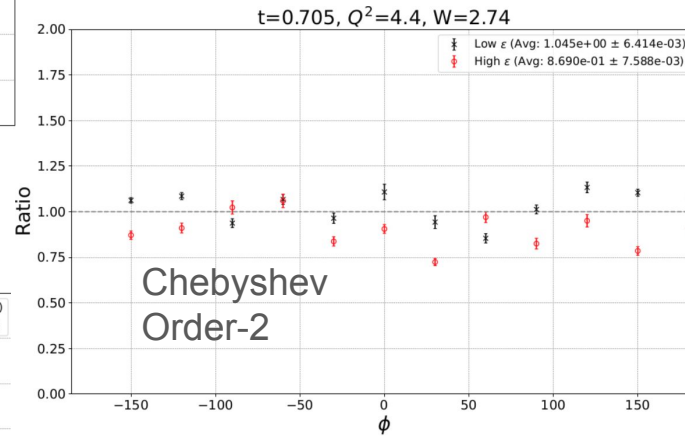
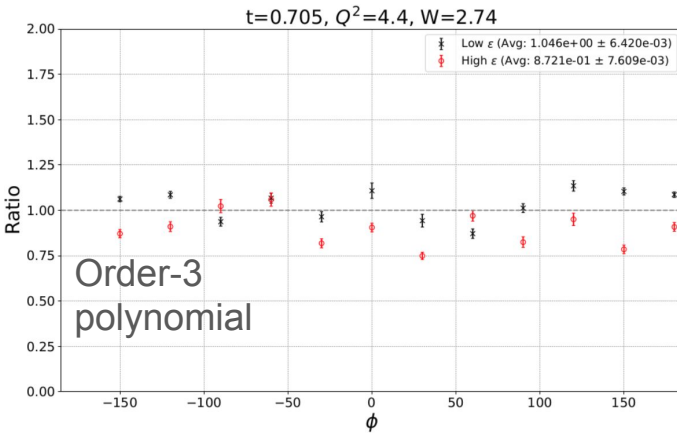
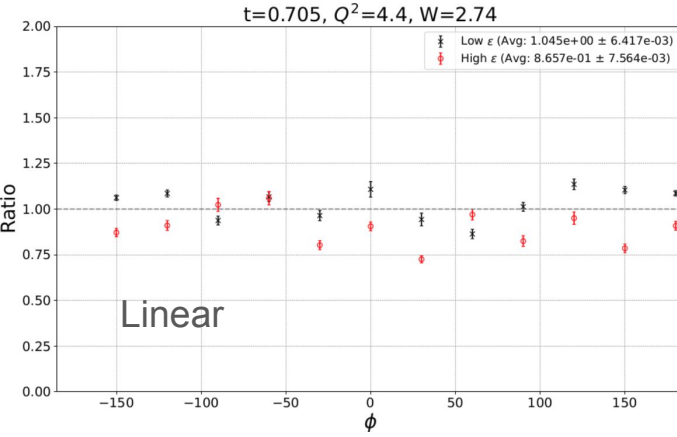


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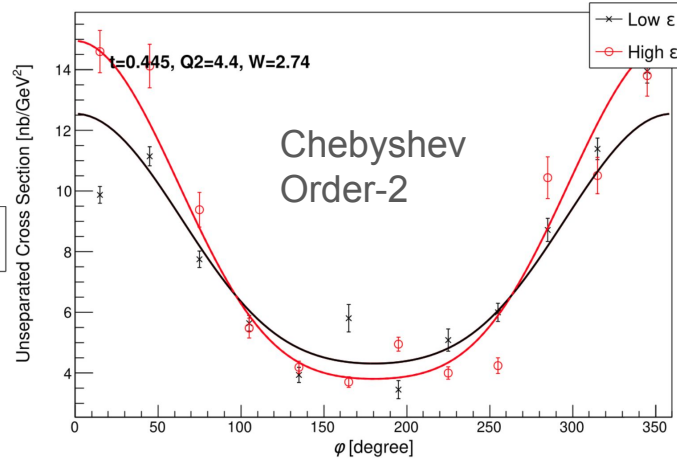
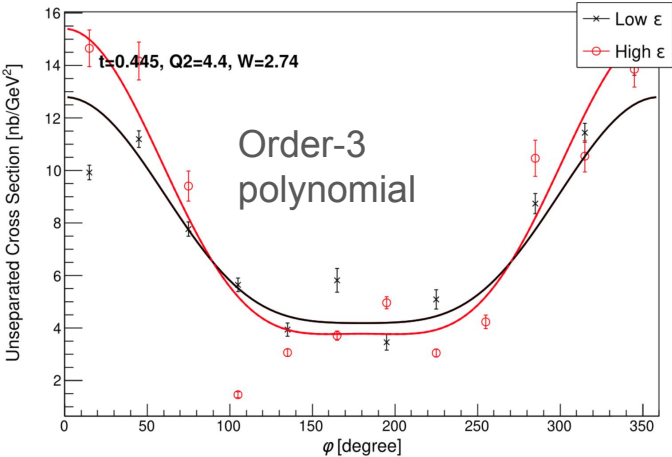
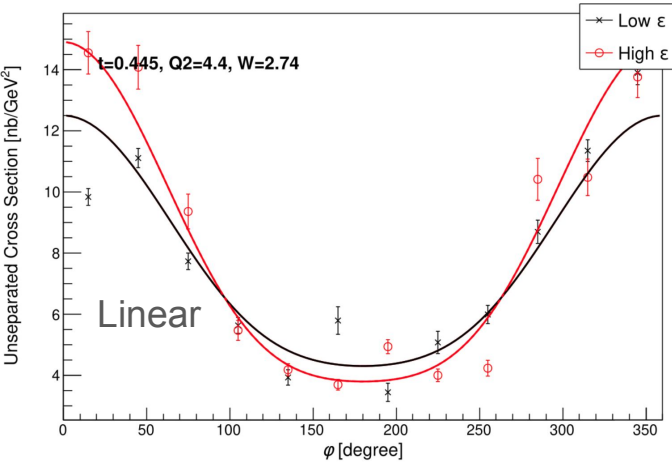
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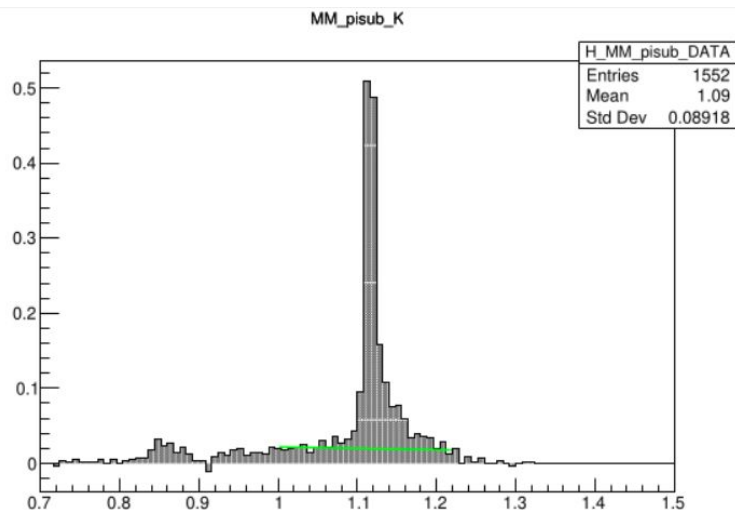
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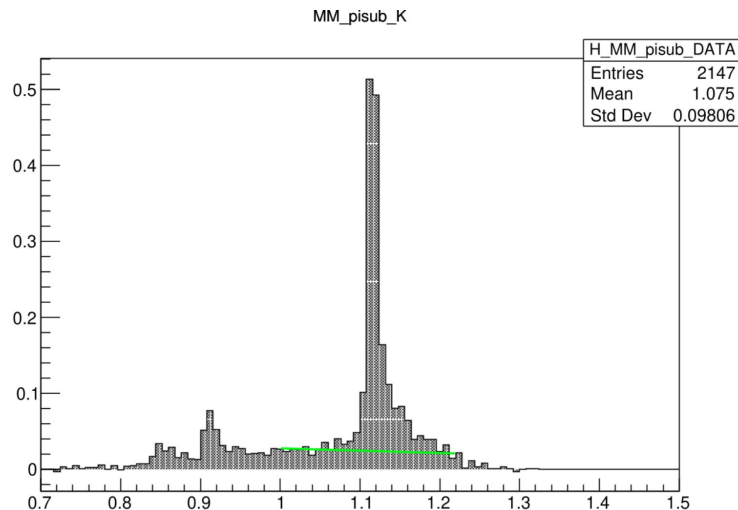
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$\pi$ -sub



No  $\pi$ -sub

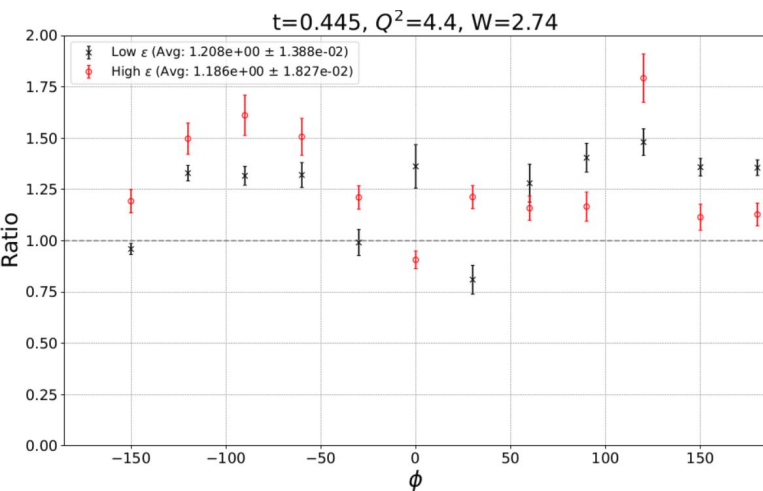


Left high  $\varepsilon$

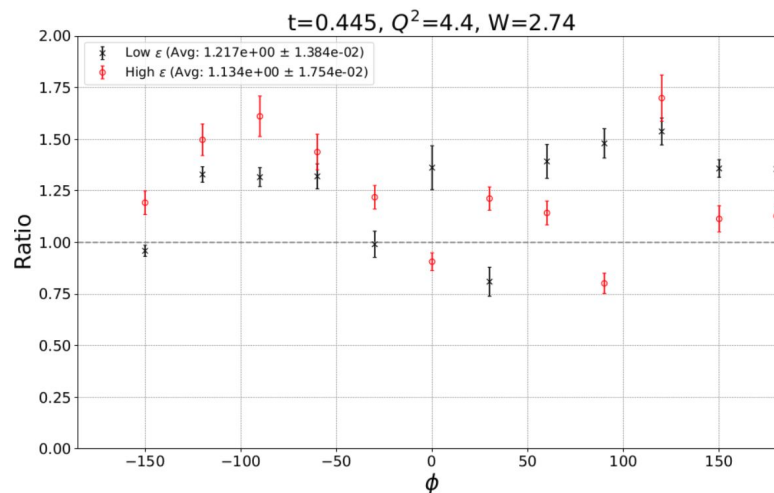
Linear  
background  
fit

$$Q^2=4.4, W=2.74 \mid 1.10 \leq M_K \leq 1.14, 0.88 \leq M_\pi \leq 0.94$$

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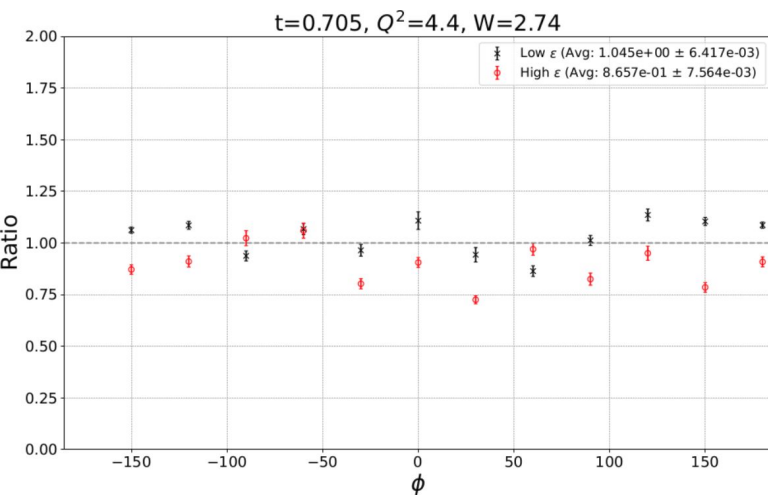


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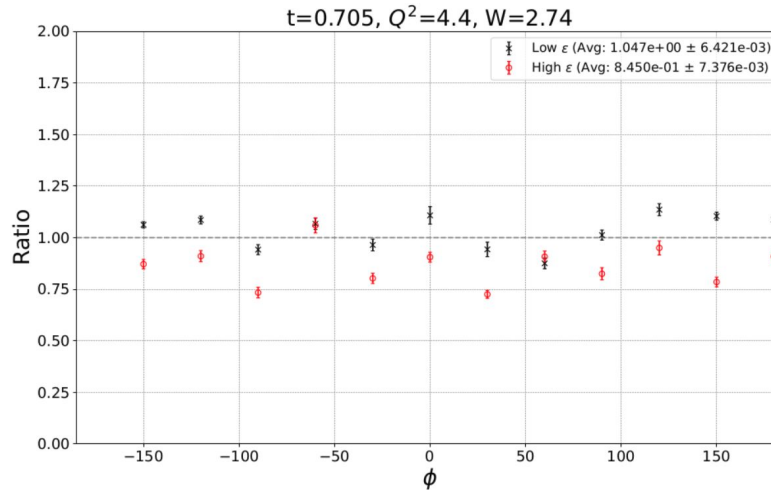
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No  $\pi$ -sub

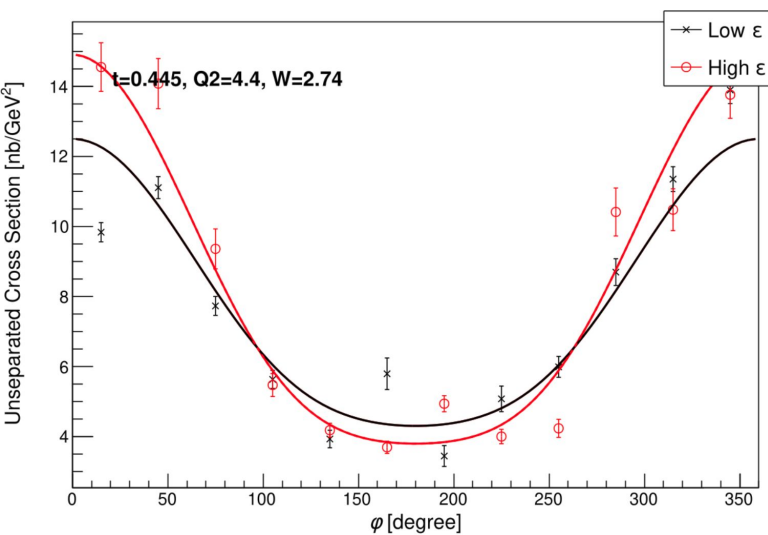


Left high  $\epsilon$

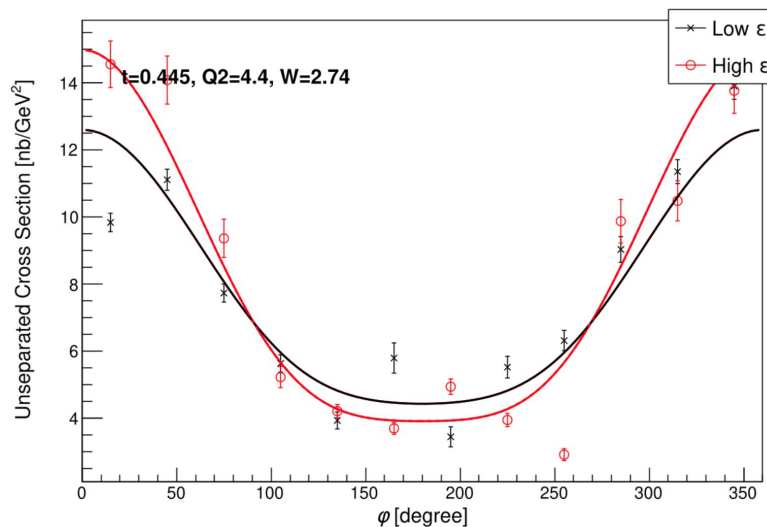
Linear  
background  
fit

$$Q^2=4.4, W=2.74 \mid 1.10 \leq M_K \leq 1.14, 0.88 \leq M_\pi \leq 0.94$$

$\pi$ -sub



No  $\pi$ -sub



Left high  $\epsilon$

Linear  
background  
fit

# To Do

## 1. Reanalyze...

- $Q^2=3.0/W=2.32$
- $Q^2=4.4/W=2.74$
- $Q^2=5.5/W=3.02$

## 2. Re-parameterize...

- $Q^2=2.115/W=2.95$
- $Q^2=3.0/W=3.14^{**}$

## 3. Refine model, last fit optimizations

## 4. Finalize systematics study (**Mid-September**)

## 5. $Q^2$ dependence, etc.

## 6. Paper Submission (**End of October**)

- Start writing in Mid-September

Extra