Pion-LT/Kaon-LT Collaboration Meeting

Muhammad Junaid
Ph.D. Student
Department of Physics
University of Regina, Canada

LTSep Analysis

- **Next steps are listed as follows:**
  - **Unseparated cross-section calculations**
  - **Model iterations**
  - **Rosenbluth equation fitting**
  - **L/T separated cross-section calculations**
  - **Pion Form Factor measurements**

New Model Functions V11

LTSep Functions

- **Started with functional forms (with SIMC W_factor):**

$$\frac{d\sigma_T}{dt} = \left(\frac{\mathrm{p1}}{Q^2}\right) \cdot \mathrm{e}^{(\mathrm{p2}\, Q^2)} \cdot \mathrm{e}^{(\mathrm{p3}\, |t|)}$$

$$\frac{d\sigma_L}{dt} = (\mathrm{p4} + \mathrm{p5}/\mathrm{Q}^2) \cdot \frac{|t|}{(|t| + m_\pi^2)^2} \cdot Q^2 \mathrm{e}^{(\mathrm{p6}|t|)} F_\pi^2$$

Where, $F_\pi = \frac{1}{(1+\mathrm{p7}\cdot Q^2+\mathrm{p8}\cdot Q^4)}$

$$\frac{d\sigma_{LT}}{dt} = \left(\frac{\mathrm{p9}}{Q^2} + \mathrm{e}^{(\mathrm{p10}|t|)} \cdot \frac{\mathrm{p11}}{(\mathrm{p12} + |t|)^2}\right) \cdot \sin(\theta^*)$$

$$\frac{d\sigma_{TT}}{dt} = \left(\frac{\mathrm{p13}}{Q^2} + \mathrm{e}^{(\mathrm{p14}|t|)\cdot} \frac{\mathrm{p15}}{(\mathrm{p16} + |t|)^3}\right) \cdot \sin(\theta^*)^2$$

Parameter	Initial Values	Parameter	Initial Values
p1	23.3	p9	0.87
p2	0.0098	P10	-5.0
p3	-1.5	P11	1.1
p4	214	P12	0.0
p5	8.6	p13	217
p6	0.7	p14	0.0
p7	1.77	P15	0.1
p8	0.05	P16	0.0

New Model Functions V12

LTSep Functions

- **Started with functional forms (with SIMC W_factor):**

$$\frac{d\sigma_T}{dt} = \left(\frac{\mathrm{p1}}{Q^2}\right) \cdot \mathrm{e}^{(\mathrm{p2}\, Q^2)} \cdot \mathrm{e}^{(\mathrm{p3}\, |t|)}$$

$$\frac{d\sigma_L}{dt} = (\mathrm{p4} + \mathrm{p5}/\mathrm{Q}^2) \cdot \frac{|t|}{(|t| + m_\pi^2)^2} \cdot Q^2 \mathrm{e}^{(\mathrm{p6}|t|)} F_\pi^2$$

Where, $F_\pi = \frac{1}{(1+\mathrm{p7}\cdot Q^2+\mathrm{p8}\cdot Q^4)}$

$$\frac{d\sigma_{LT}}{dt} = \left(\frac{\mathrm{p9}}{Q^2} + \mathrm{e}^{(\mathrm{p10}|t|)} \cdot \frac{\mathrm{p11}}{(|t|)^{\mathrm{p12}}}\right) \cdot \sin(\theta^*)$$

$$\frac{d\sigma_{TT}}{dt} = \left(\frac{\mathrm{p13}}{Q^2} + \mathrm{e}^{(\mathrm{p14}|t|)\cdot} \frac{\mathrm{p15}}{(\mathrm{p16} + |t|)^3}\right) \cdot \sin(\theta^*)^2$$

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LTSep Analysis

- **Working on physics setting: "Q2 = 3.85, W = 2.62, t = 0.21 (2 epsilons)"**

- **The following studies have been finalized for Pion Form Factor measurement:**
  - **Unseparated cross-section calculations**
  - **Model iterations**
  - **Rosenbluth equation fitting**
  - **L/T separated cross-section calculations**

- **In progress:**
  - Working on model iterations.