E02-013 Analysis Update

Seamus Riordan

March 19, 2008

◆□ > ◆圖 > ◆臣 > ◆臣 >

 Started using additional missing mass cut to explicitly suppress inelastic events.

$$m_{\rm miss}^2 = (P^{^{3}{\rm He}} + q - p_{n,f})^2$$
(1)

イロト イポト イヨト イヨト

- Minimum missing mass for π electroproduction $2m_p + m_\pi \approx 2 \text{ GeV}$
- Placing a cut on 2 GeV still lets some through due to resolution effects.
- Use MC to determine contribution sizes

Missing mass for data:



<ロ> (四) (四) (三) (三) (三)



・ロト ・ 日 ・ ・ ヨ ・ ・ ヨ ・

Gregg used MAID data and provided interpolation for pion electroproduction channels:

$$\gamma^* p \to p \pi^0$$

$$\gamma^* p \to n \pi^+$$

$$\gamma^* n \to n \pi^0$$

$$\gamma^* n \to p \pi^-$$

Integrated these results into my basic MC

- 4 回 2 - 4 □ 2 - 4 □

MC Procedure:

- Generate two nucleons with random 3D gaussian momentum distribution
- Calculate struck nucleon momentum by p and E conservation: P^{³He} = p_i + p_{rand1} + p_{rand2}
- Boost to struck nucleon rest frame to calculate scattering
- Generate random scattering event for elastic or electroproduction: $ep \rightarrow n\pi^+$ or $en \rightarrow n\pi^0$
- Calculate differential cross section for this event
- Boost back to lab frame
- Check acceptance through cut in scattering angle
- Weight event by cross section

イロト イポト イヨト イヨト

- Resolution measured from H_2 data
- ► Momentum spread from ³He
- Qualitatively in agreement with data:

Kin 4:



Kin 3:



<ロ> (四) (四) (三) (三) (三)

Do QE cuts (with $m_{\rm miss}$ cut) to determine contamination:



イロン イヨン イヨン イヨン

Э

- Already less than 1% for kin 4 data
- Kin 3 data move max W cut from 1.15 GeV to 1.05 GeV.
- Kin 3 contamination about 2%
- Moved low W cut from 0.8 GeV to 0.7 GeV for both kins.

- < ∃ >

In conjunction with $A_{\rm raw}$ vs. W we conclude contributions are small



・ロン ・回 と ・ヨン ・ヨン

Now using G_M^n data from CLAS (Jeff Lachniet thesis)

- $G_F^n(1.72 \text{ GeV}^2) = 0.0291 \pm 0.0040$
- $G_E^n(3.47 \text{ GeV}^2) = 0.0083 \pm 0.0029$



 G_E^n as W cut width is varied (we use middle point):



Small changes occur for kin 3 due to larger contamination

< ≣ >

Graduation status:

- Gregg and I have made a first pass over thesis so far (included in this directory)
- Still need to write up intro, theory, previous exp., and models
- Please look over thesis and let me know of any disagreements with analysis or results (mostly last 2 chapters)
- Thesis (what I have w/ results) should go out to committee next week to stay somewhat on track

イロト イポト イヨト イヨト