Contents

1 Meeting 11-20-13

1.1 Formalism

Using the form of the double-differential Cross-section for single-pion Electroproduction(2 d.o.f.), we can formalize the following for double-charged-pion Electroproduction:

$$\left(\frac{d\sigma}{dX^{ij}d\phi^{j}}\right)^{h} = A^{ij} + B^{ij}\cos\phi^{j} + C^{ij}\cos 2\phi^{j} + hPD^{ij}\sin\phi^{j} \tag{1.1.1}$$

where

- ij = index over Varset,Variable (3x5 matrix)
- $R2^{ij}_{\alpha} \doteq [A^{ij}, B^{ij}, C^{ij}, D^{ij}] \equiv [R_T + \epsilon_L R_L, R_{LT}, R_{TT}, R_{LT'}]$
- $R2^{ij}_{\alpha} = f(Q^2, W, X^{ij})$

For convenience, I define the following:

$$f^{h}(X^{ij}, \phi^{j}) \doteq \left(\frac{d\sigma}{dX^{ij}d\phi^{j}}\right)^{h} \tag{1.1.2}$$

1.2 Event selection

1. `eid`
2. `efid`
3. `momcorr`
4. `MM Cuts`

1.3 R2 Extraction method

Of the methods listed earlier:

1. Fit $f^{h}(X^{ij}, \phi^{j})$ to extract 'R2'
2. Calculate Asymmetry $\doteq f^{h=+} - f^{h=-}$ and then extract D^{ij}

3. $\int f^h(X^{ij}, \phi^j) * (\cos\phi / \cos 2\phi / \sin\phi) d\phi$ to extract $B^{ij}/C^{ij}/D^{ij}$

Method 3. is used, which even at the level of algorithmic detail is listed below. NOTE that when multiplying by $\sin\phi$, the sign of the polarization is explicity used

For every q2wbin:

1. h5[pol] where pol $\in$ {POS,NEG,UNP,AVG}; pol $\neq$ AVG
2. h5m[pol,pob] = h5[pol]$\cdot$h5f[pob]
   - pob $\in$ {A,B,C,D}; pol $\neq$ AVG
   - h5f[pob]:
     - For every bin i, h5f[pob](i) = f[pob](i)
     - f[pob] $\in$ {N.A.,$\cos\phi$,$\cos 2\phi$,sign(pol) $\sin\phi$}
3. hR2_Xij[pol,pob] = h5m[pol,pob] Project on to X^{ij}; pol $\neq$ AVG
4. hR2_Xij[pol=AVG,pob] = (hR2_Xij[pol=POS,pob] + hR2_Xij[pol=NEG,pob])/2

1.4 Observations

Focussed only on <B/C/D>_1THETA

- **Consistencies**:
  1. <B/C>[pos]=<B/C>[neg]=<B/C>[unp]
  2. exp-C[unp] $\approx$ sim-C[unp]
- **Inconsistencies**:
  1. exp-D[unp] $\neq 0$
     - D[pos] = -D[neg]
     - D[unp] = D[pos]
  2. sim-D[unp] $\neq 0$
     - sim-D[unp] $\neq$ exp-D[unp]
  3. sim-D[unp] $\neq$ exp-D[unp]