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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:

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

where

- ij = index over Varset,Variable (3x5 matrix)
- $R2_{\alpha}^{ij} \doteq [A^{ij}, B^{ij}, C^{ij}, D^{ij}] \equiv [R_T + \epsilon_L R_L, R_{LT}, R_{TT}, R_{LT'}]$
- $R2_{\alpha}^{ij} = f(Q^2, W, X^{ij})$

For convenience, I define the following:

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

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 explicitly used

For every `q2wbin`:

1. `h5[pol]` where `pol` \in {POS,NEG,UNP,AVG}; `pol` \neq AVG
2. `h5m[pol,pob] = h5[pol]·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 Notes on current observations