Modeling the kinematics of e(d,p'p'X)e'

P.King
Ohio University

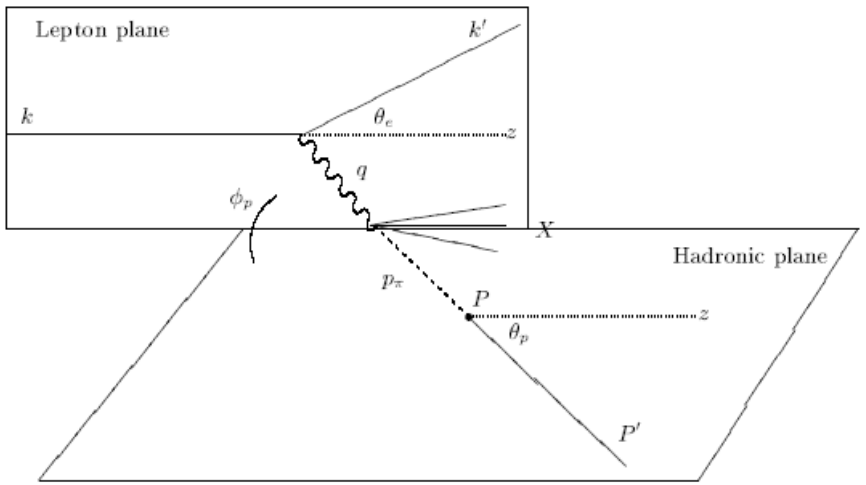
Process used in the model

- Generate a real proton, virtual neutron pair from an at-rest deuteron
- Generate a real proton, virtual pion pair from the neutron with the proton carrying momentum fraction, z, and transverse momentum, p_T
- Calculate the en→e'p'X cross-section using

$$\frac{d\sigma(en\rightarrow e'p'X)}{dx_{Bj}\,dQ^2\,dz\,dp_T^2} = f_{p\pi/n}(z, p_T^2)\,\sigma_\pi(x_{Bj}/(1-z), Q^2)$$

- Unfortunately, $f_{p\pi/n}$ has non-physical values in the recent model calculations, so I won't show any rates today

Process of the model



- Deuteron starts at rest
- Spectator proton, p_1, thrown using deuteron nucleon momentum distribution, and flat in $\cos(\theta)$ and ϕ
- Electron kinematics (E' and θ_e) are generated flat in Q^2 and x_{Bj}, only keep θ_e in the range (5°,15°); ϕ_e is flat in the range (-12°,12°)
- Fragmentation in the neutron rest frame is thrown flat in p_T and z

Plans and questions

- Recheck the fragmentation and pion cross section functions in the model
- Determine reasonable ranges for the acceptance of both protons (currently we see the most rate for p2 going forward, with p1 going backward)
- What are the limits of detectable proton momenta?
- What will be the effect of interactions between the two protons?