

ρ^0 Analysis Introduction

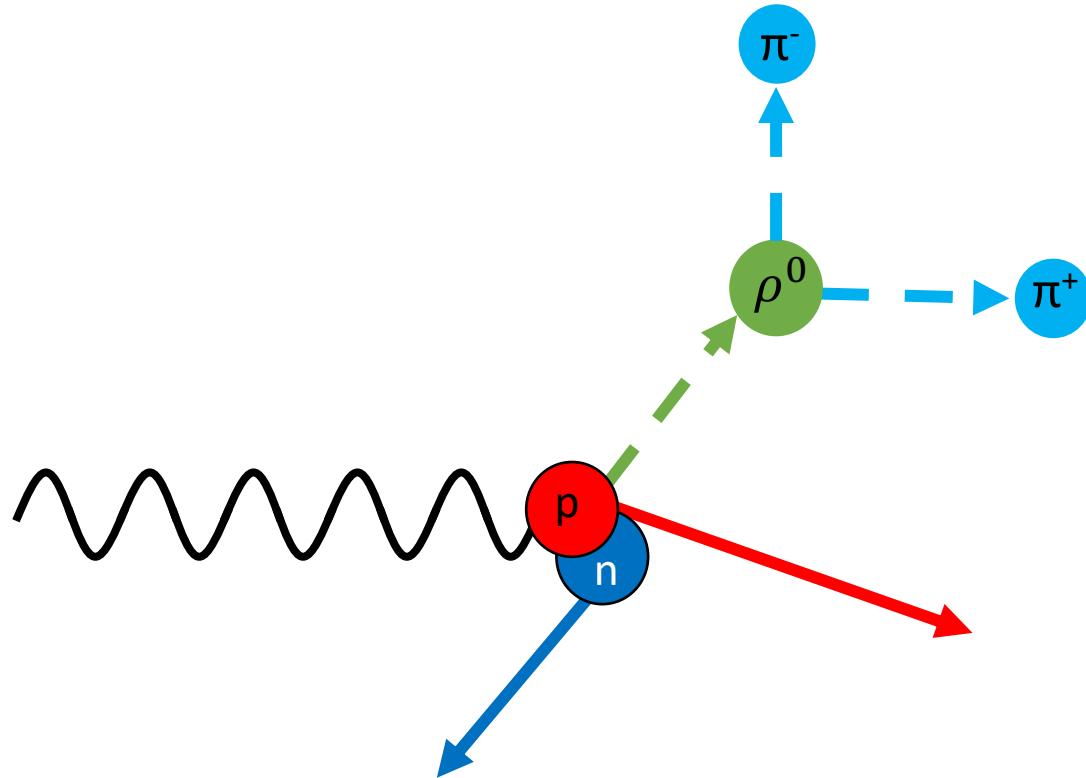
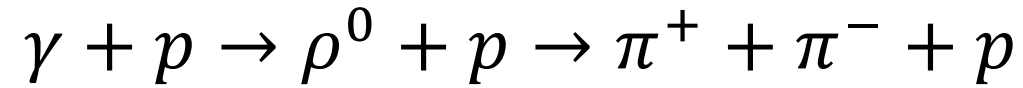
Technical Meeting

July 07, 2022

Phoebe Sharp

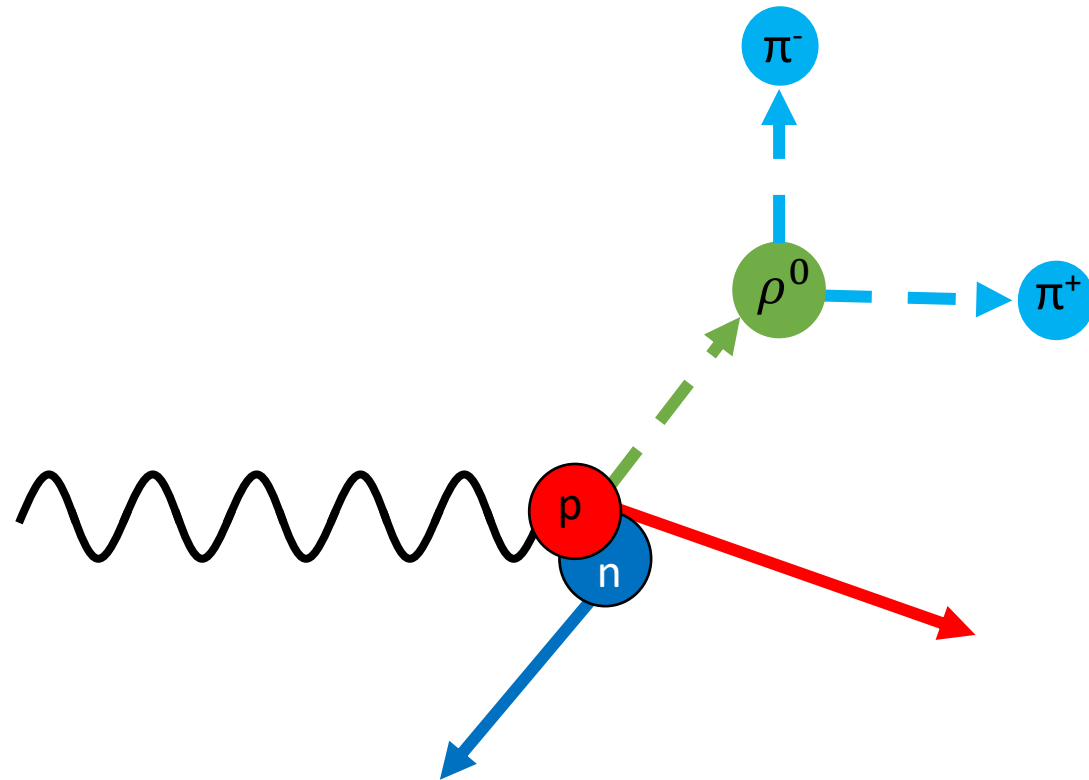
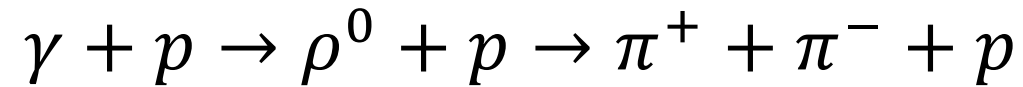
psharp15@gwu.edu

My Reaction Channel: ρ^0



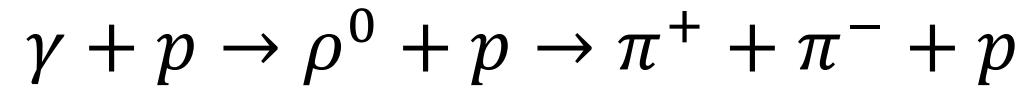
p reactions	n reactions
$\gamma p \rightarrow \pi^0 p$	$\gamma n \rightarrow \pi^- p$
$\gamma p \rightarrow \pi^- \Delta^{++}$	$\gamma n \rightarrow \pi^- \Delta^+$
$\gamma p \rightarrow \rho^0 p$	$\gamma n \rightarrow \rho^- p$
$\gamma p \rightarrow K^+ \Lambda$	$\gamma n \rightarrow K^0 \Lambda$
$\gamma p \rightarrow K^+ \Sigma^0$	$\gamma n \rightarrow K^0 \Sigma^0$
$\gamma p \rightarrow \omega p$	$\gamma n \rightarrow K^+ \Sigma^-$
$\gamma p \rightarrow \phi p$	$\gamma n \rightarrow K^- \Sigma^+$
\vdots	\vdots

Using the ρ^0 reaction channel, I want to answer these question:



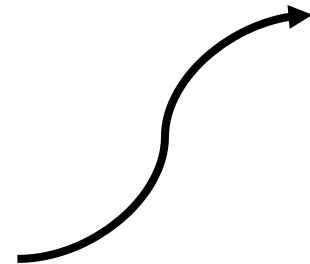
1. Can np-dominance be verified with photon scattering?
2. Can photoproduction confirm the abundances of SRC pairs?

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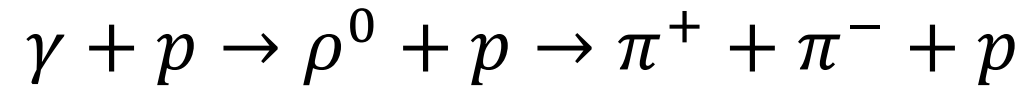
To do this, I will look at:

- $\gamma + p + m(n) \rightarrow \rho^0 + p$
- $\gamma + p + (p) \rightarrow \rho^0 + p + p$
- $$\frac{\sigma(\rho^0 + p + p)}{\sigma(\rho^0 + p)}$$



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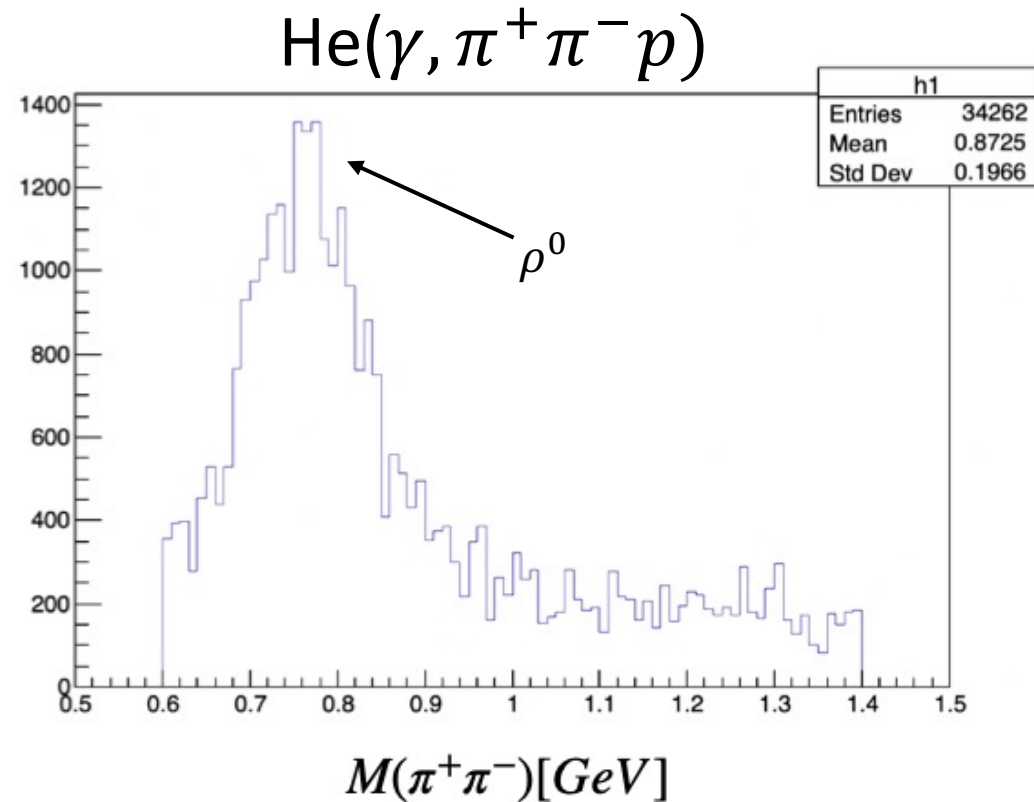
- $\frac{A(\rho^0 pp)}{d(\rho^0 pp)}$ for C12 and He4

1. Can np-dominance be verified with photon scattering?

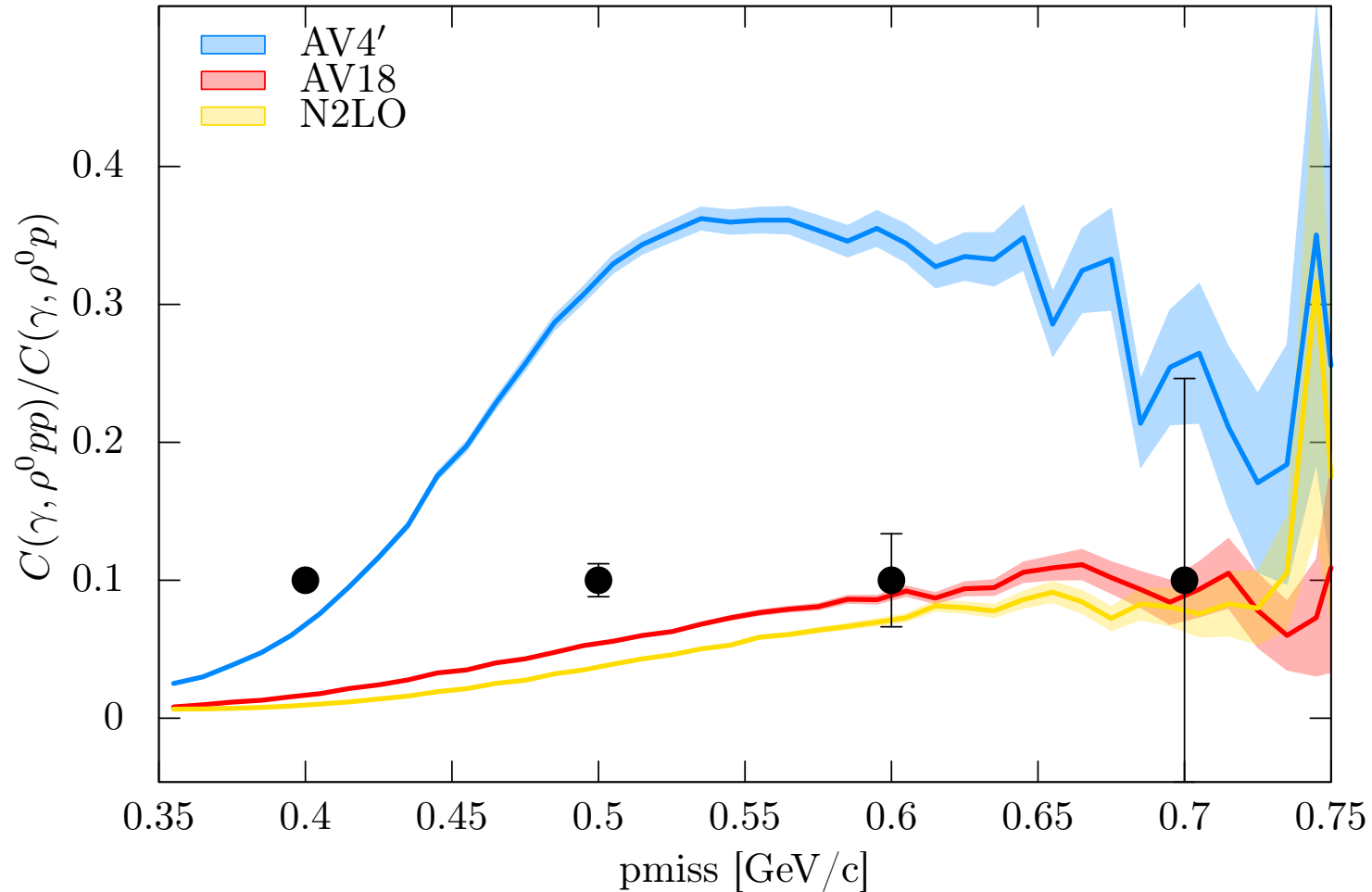
2. Can photoproduction confirm the abundances of SRC pairs?

Process?

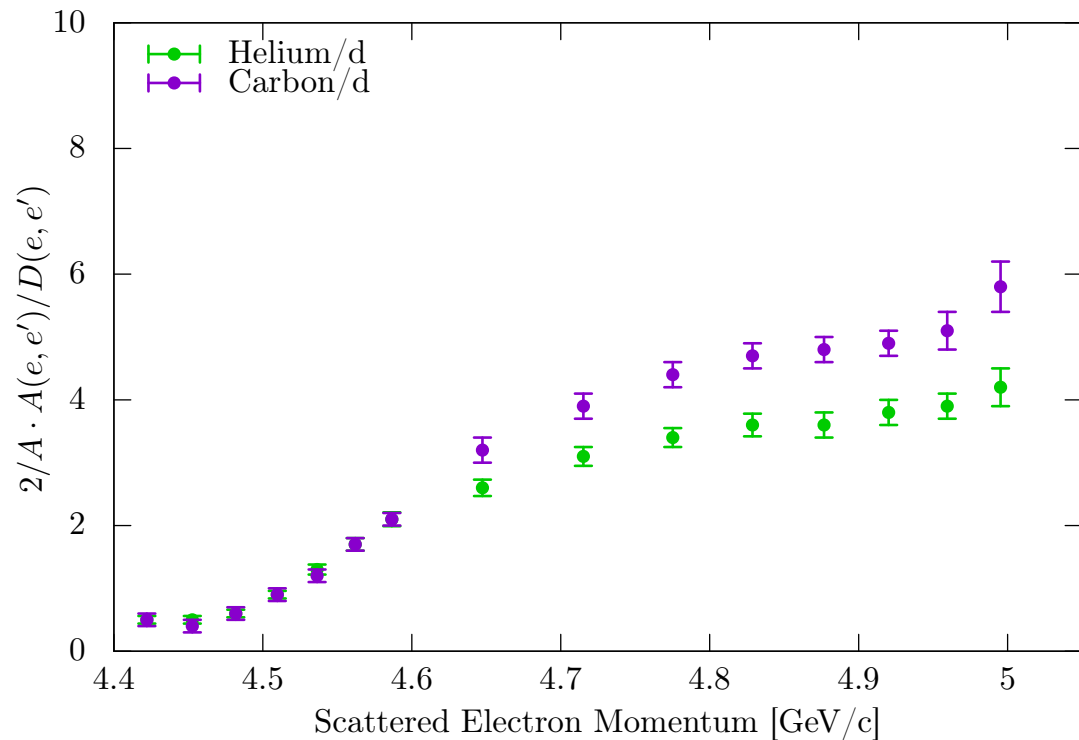
- Calibration
- Reconstruction
- Event Selection
 - Particle ID
 - Fiducial Volume
 - Recoil Acceptance
 - Background
- Analysis
 - Np-pair dominance
 - Abundance of SRC pairs
 - Comparison to Theory



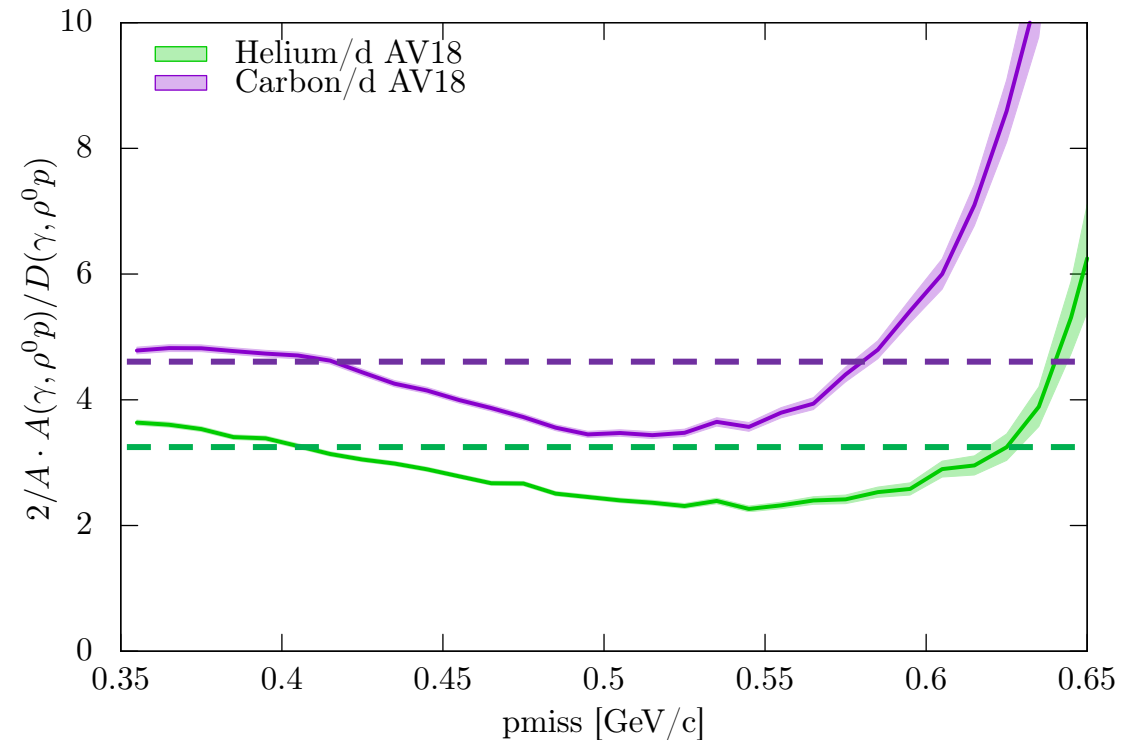
GCF Predictions of np-pair dominance using ρ^0 photoproduction.



GCF Predictions of pp-pair to np-pair abundances using ρ^0 photoproduction.



Previous electron scattering data



Photoproduction prediction