Nuclear transparency with $\gamma n \rightarrow \pi^- p$ channel

- Transparency on helium at larger angles
- Fitting converged by tweaking the fitting process
- First data point at 6.25 GeV is systematically deviating





Nuclear transparency with $\gamma n \rightarrow \pi^- p$ channel

Compared with theoretical calculations in the proposal





Background simulation study

- Bggen event generator from GlueX simulation package
- Simulation of photoproduction of hadronic background based on Pythia
- Simulated events processed with the same cuts as the data
- Currently showing simulation on protons in He-4

Thrown topology of survived events

- Signal channel is $\gamma n \rightarrow \pi^- p$
- Dominant background is $\gamma p \rightarrow \rho^0 p \rightarrow \pi^+ \pi^- p$



				Г	HistThrownTopologies After			
					Entrio			<u> </u>
					Entrie	S	47785	,
					Mean		C)
					Std D	ev	()
				_				
τ ⁺ 2π⁻p	$\pi^+ K^0_L K^- p$	$\pi^+ 2\pi^- K^+ p[\Lambda]$	π ⁺ npp	2γπ+K ⁺ k	< ⁻ n[π ⁰]	μ⁺μ⁻p		
			I nrown Topologies					

Thrown PID of survived events

- Misidentification of π^+ as p dominates
- Spectator p goes undetected



	HistThrownPart	HistThrownParticles_After			
	Entries	47789			
	Mean	0			
	Std Dev	0			
5					
$K_{K^{\dagger}(K^{\dagger}K^{-}p)}^{\pi^{\dagger}\pi^{\dagger}}(2\pi^{\dagger}\pi^{-}n)}(\pi^{\dagger}\pi^{-}p)$	$\frac{\pi \pi^* (2\gamma \pi^*)}{Thrown Particles}$))			

Distribution of the observable P_{miss}^{-}

- Contributes to the background tail in the signal region
- Simulated events are dominantly in the low t region



Bkg simulation

Invariant mass with $\pi^-\pi^+$ hypotheses

• Peaked around $m_{\rho^0} = 775 \text{ MeV}$

