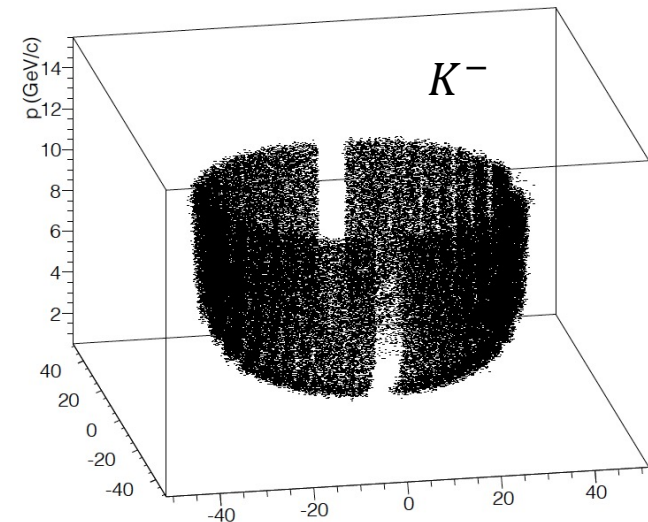
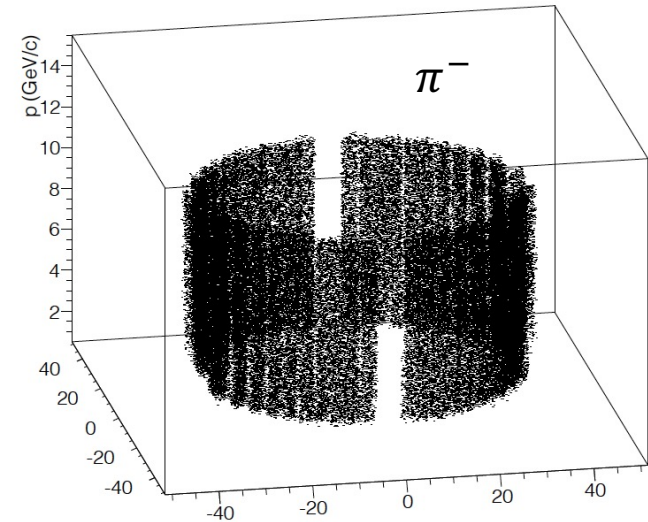
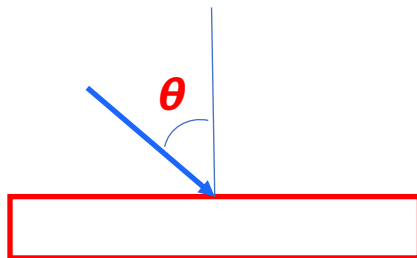
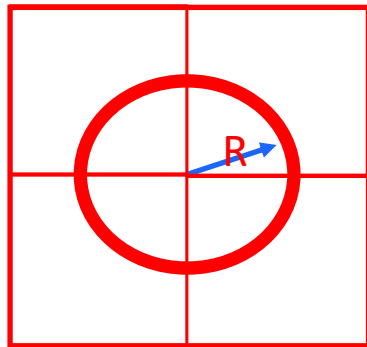


# *mRICH Performance: Reconstruction/ PID*

M. Sarsour (GSU)

## ❖ Likelihood method

- ❖ Establish a DB and match patterns based on Likelihood!



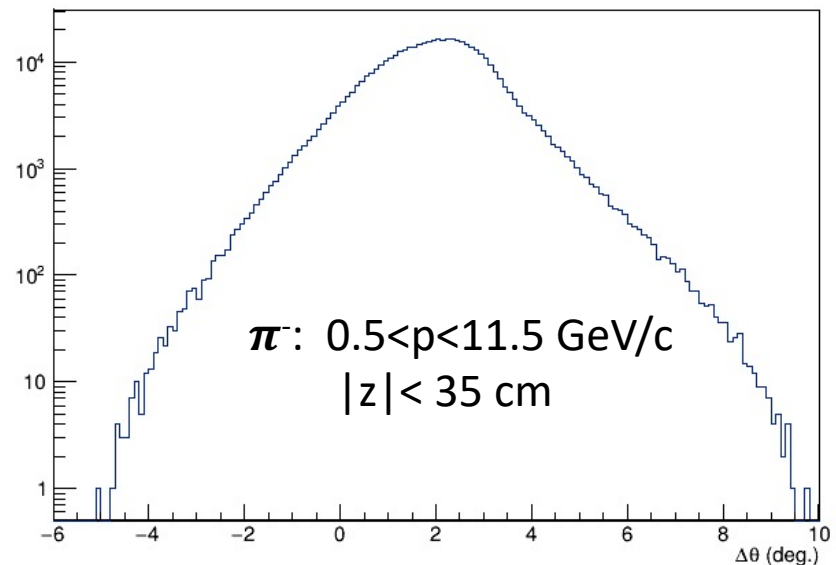
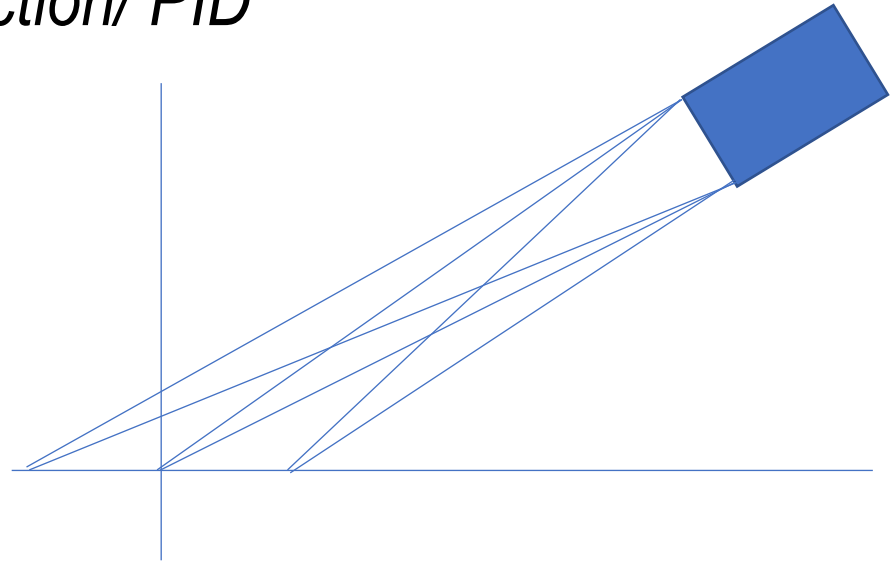
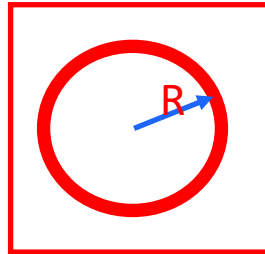
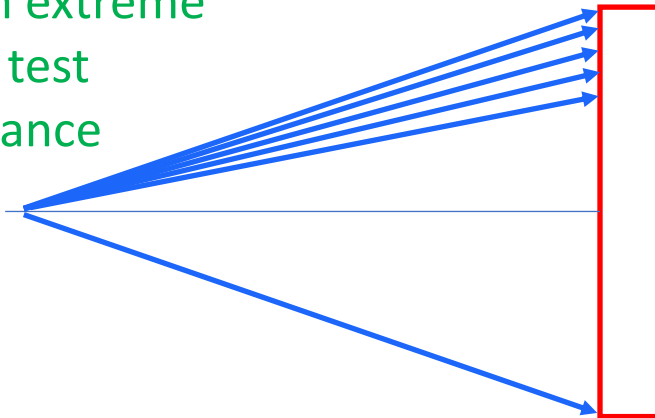
# Reconstruction/ PID

## Current limitations

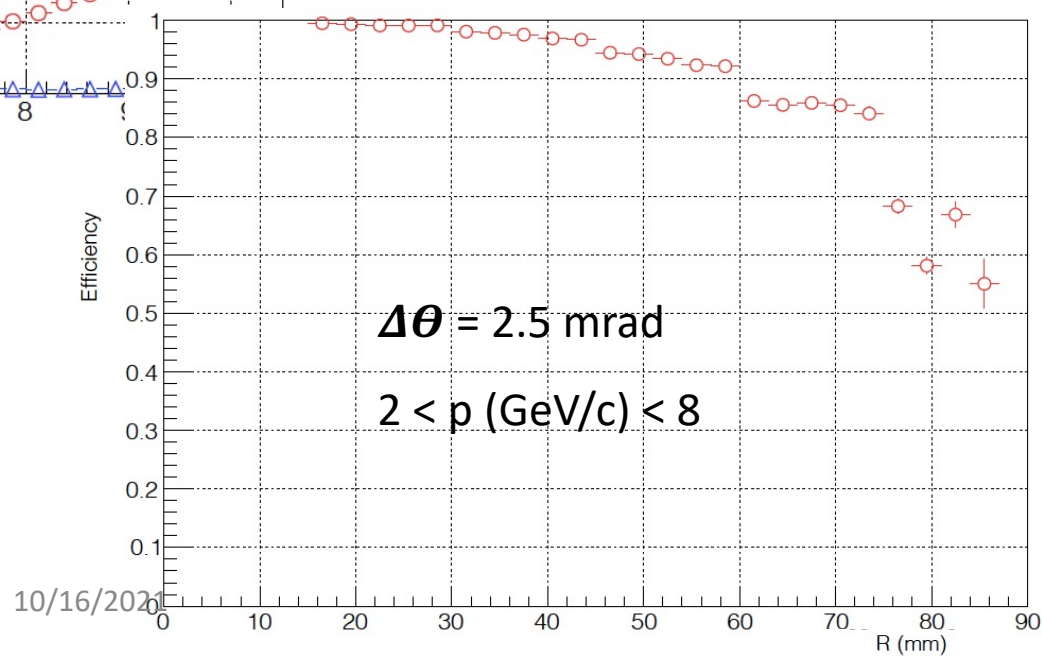
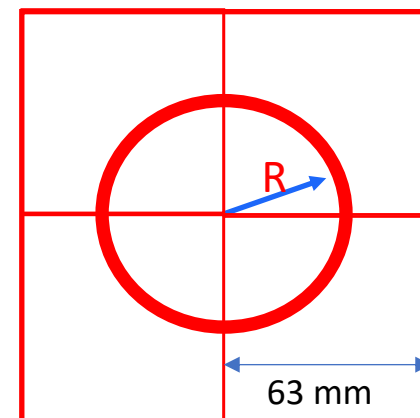
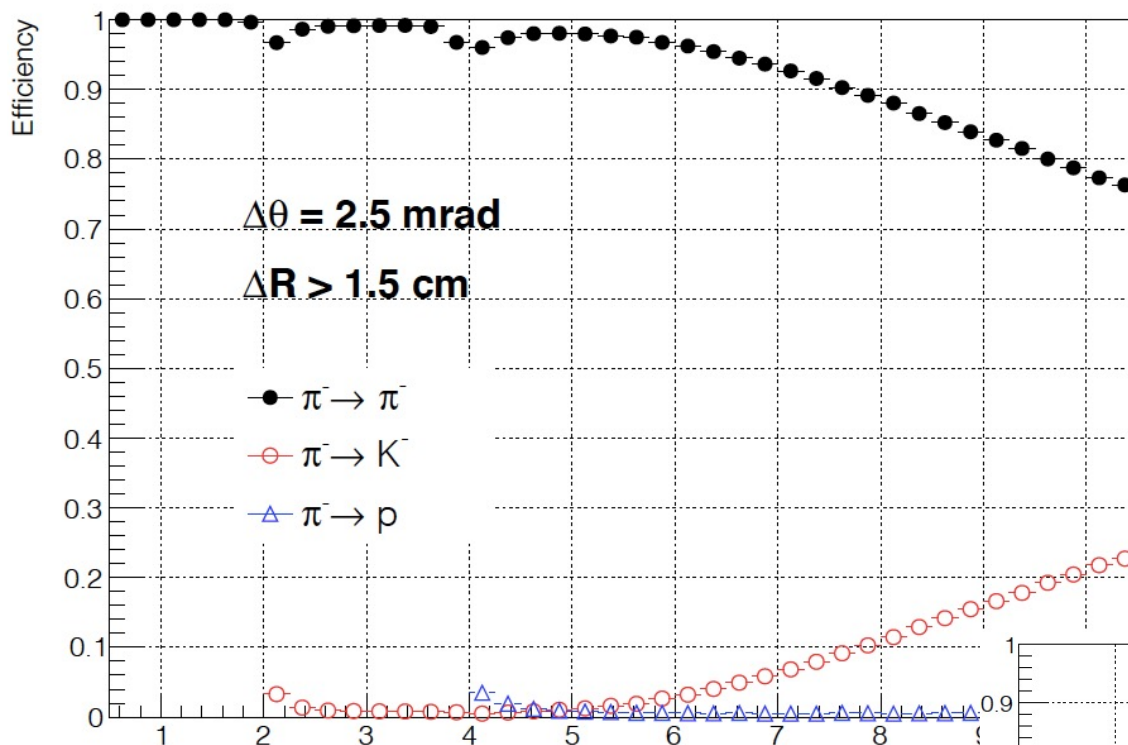
- Position resolution:  
 $\Delta R \sim 90 \text{ mm}$   
Assuming 3 mm pixel size  
 $\Rightarrow$  Need 30 R bins
- Angular resolution:  
 $\Delta\theta \sim [-3, 7] \sim 0.175$   
If binned with optimal angular resolution  
1.5 mrad  $\Rightarrow$  Need  $\sim 120 \theta$  bin
- No. of variations 3600 (one quadrant)
  - $\times 4 (e^-, \pi^-, K^-, p) \sim 14,400$

*Too much!*

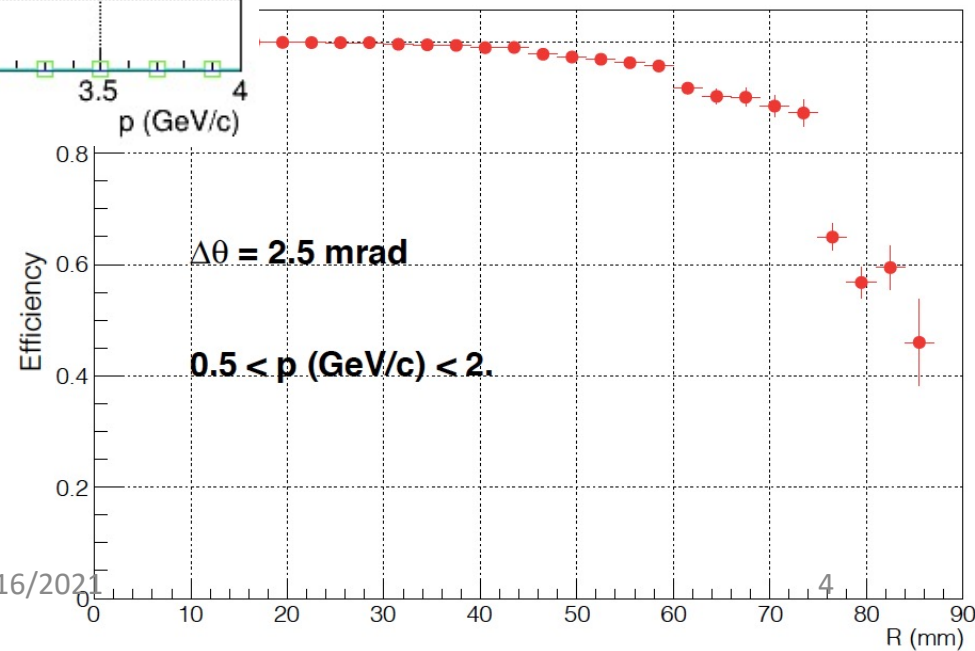
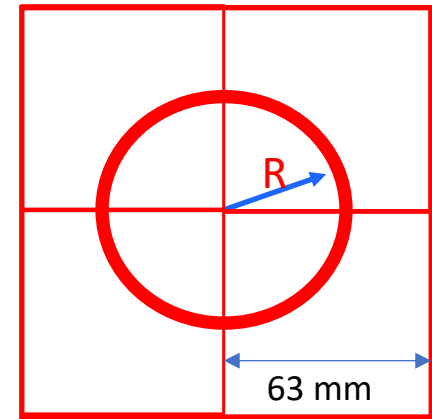
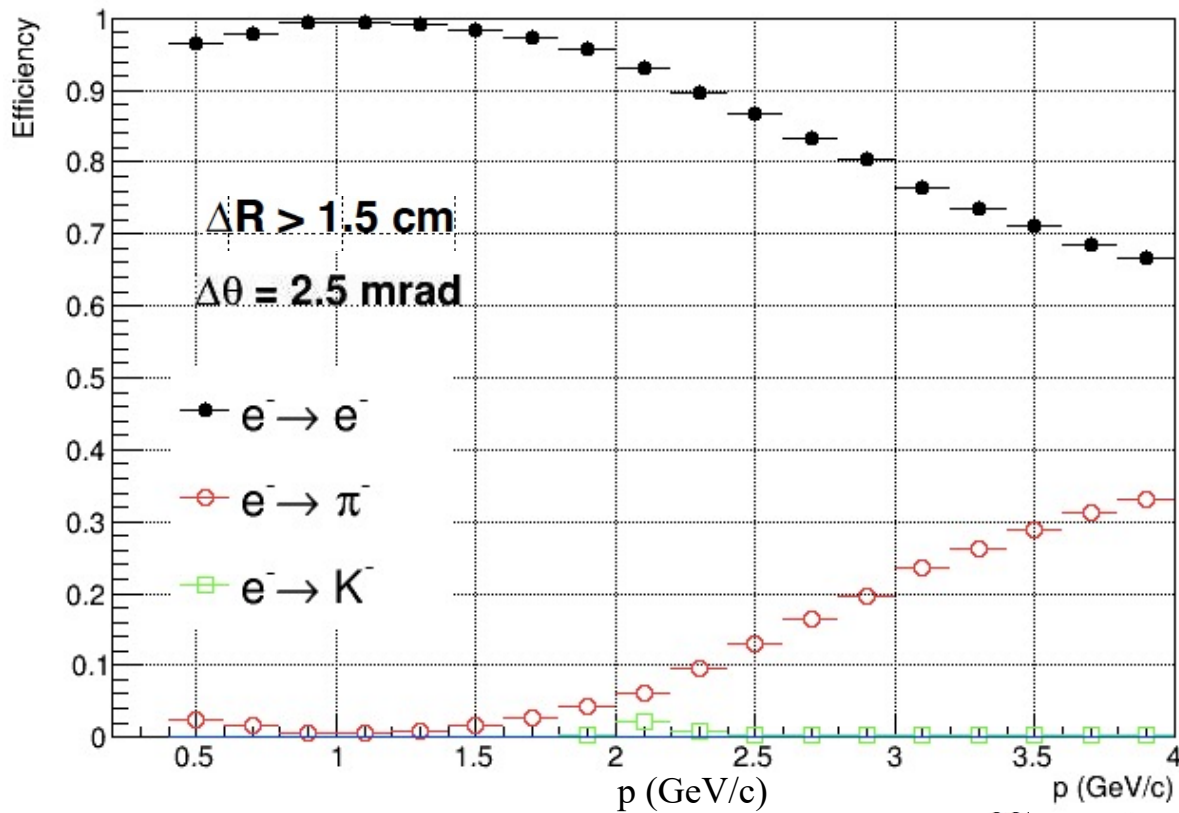
❖ Focus on extreme cases to test performance



# Reconstruction/ $\pi/K$ separation

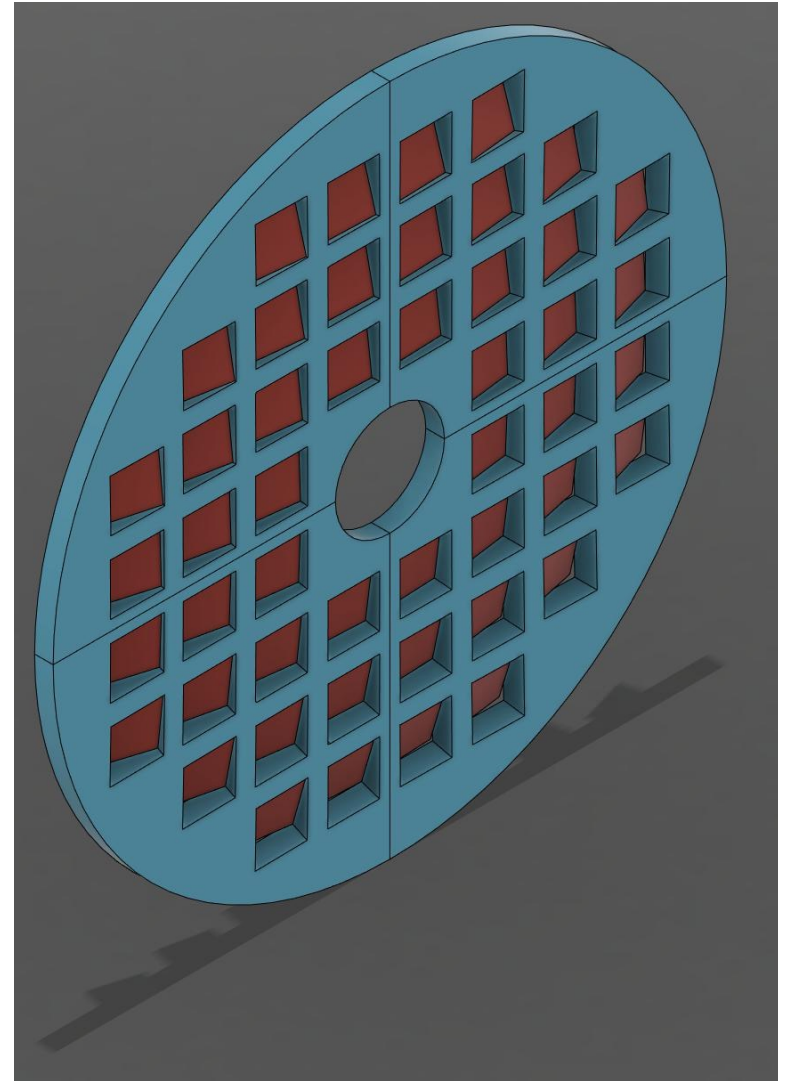
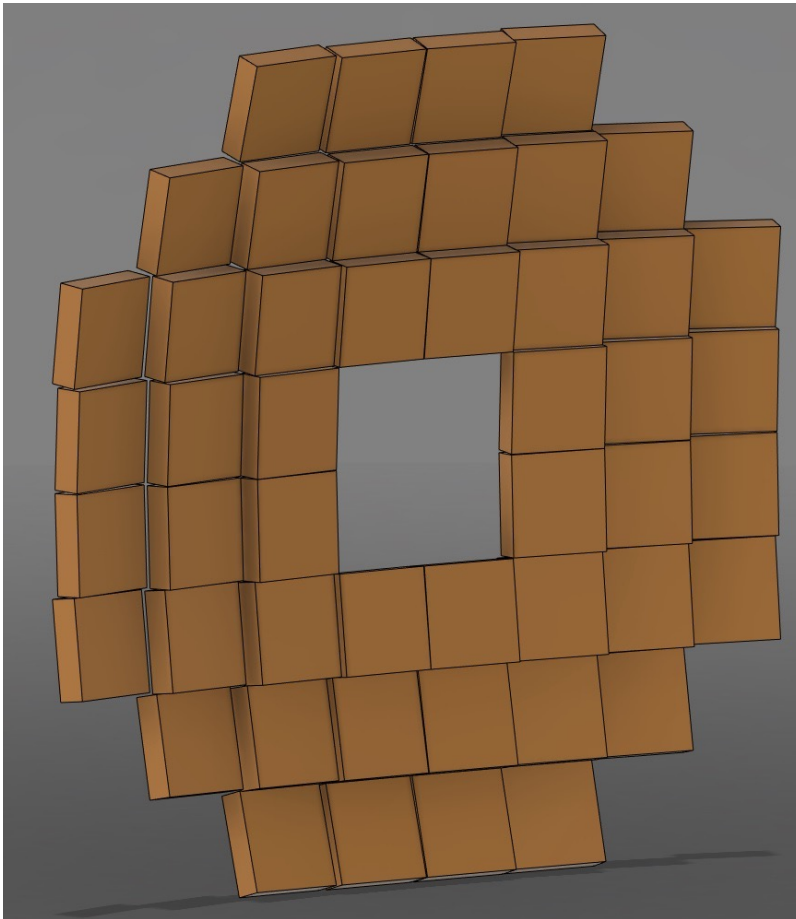


# Reconstruction/ $e/\pi$ separation



# *Support Frame Design*

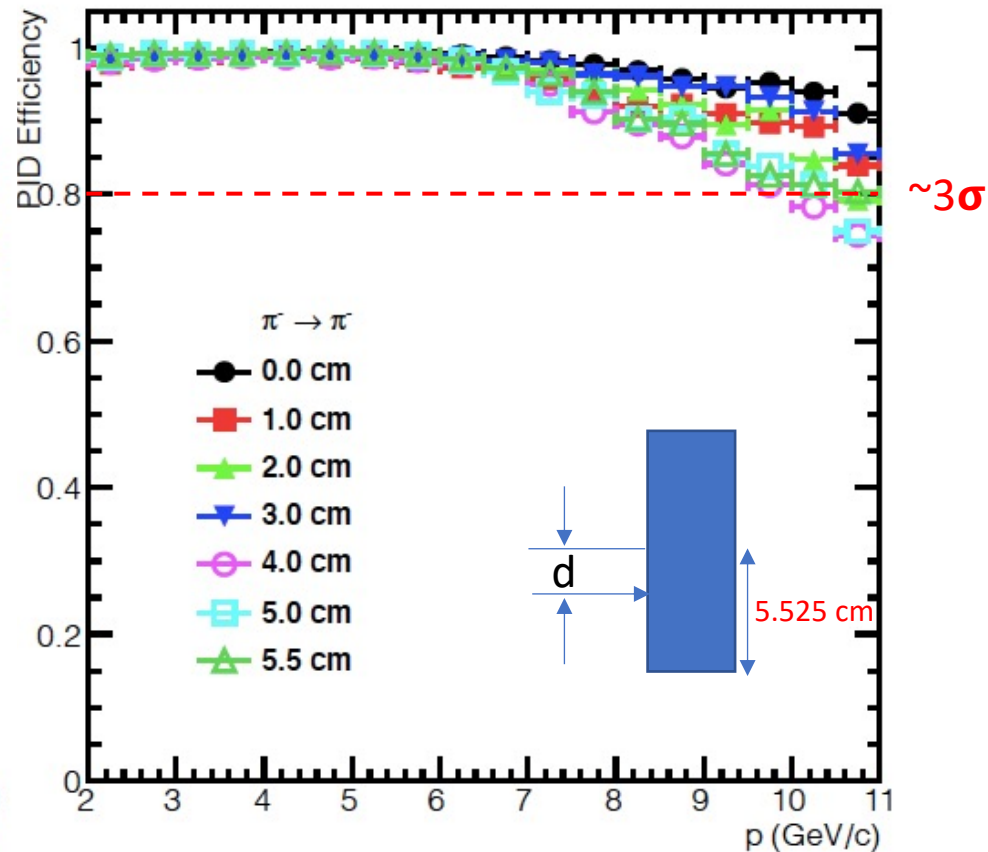
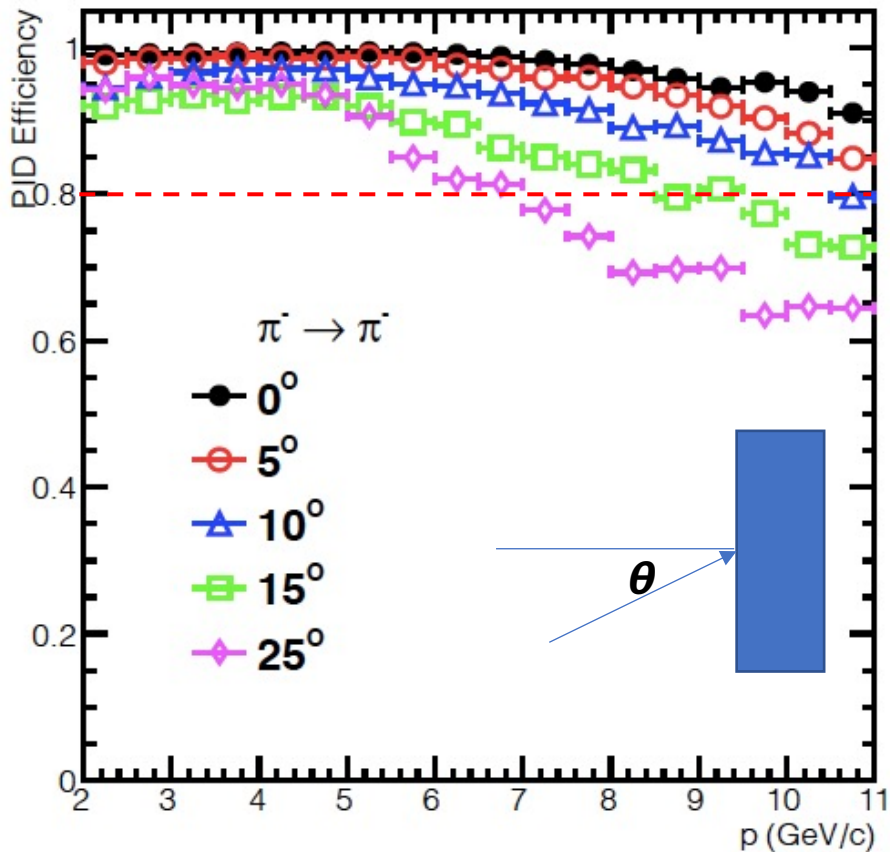
- Alexander Barnyakov (Russia)
- Alex Eslinger (Jlab)
- Edward Kistenev (BNL)



## *Additional Slides*

# mRICH PID Performance: $\pi^-/K^-$

- Construction code output:  $\mathcal{L}_\pi, \mathcal{L}_K, \mathcal{L}_p$
- $\pi^- \rightarrow \pi^-: \mathcal{L}_\pi - \mathcal{L}_K > 0 \&\& \mathcal{L}_\pi - \mathcal{L}_p > 0$



- Efficiency drops beyond  $15^\circ$
- When incident perpendicular no impact even at the edge of the Aerogel
- ⇒ Projective setup if preferable!



# Reconstruction/ PID

Focusing on a single module for performance studies!

❖ Ring radius without considering the sensor pixelization!

