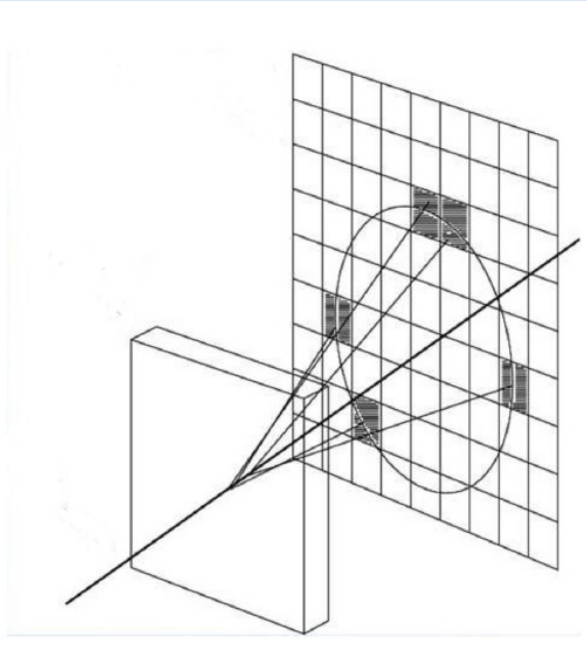
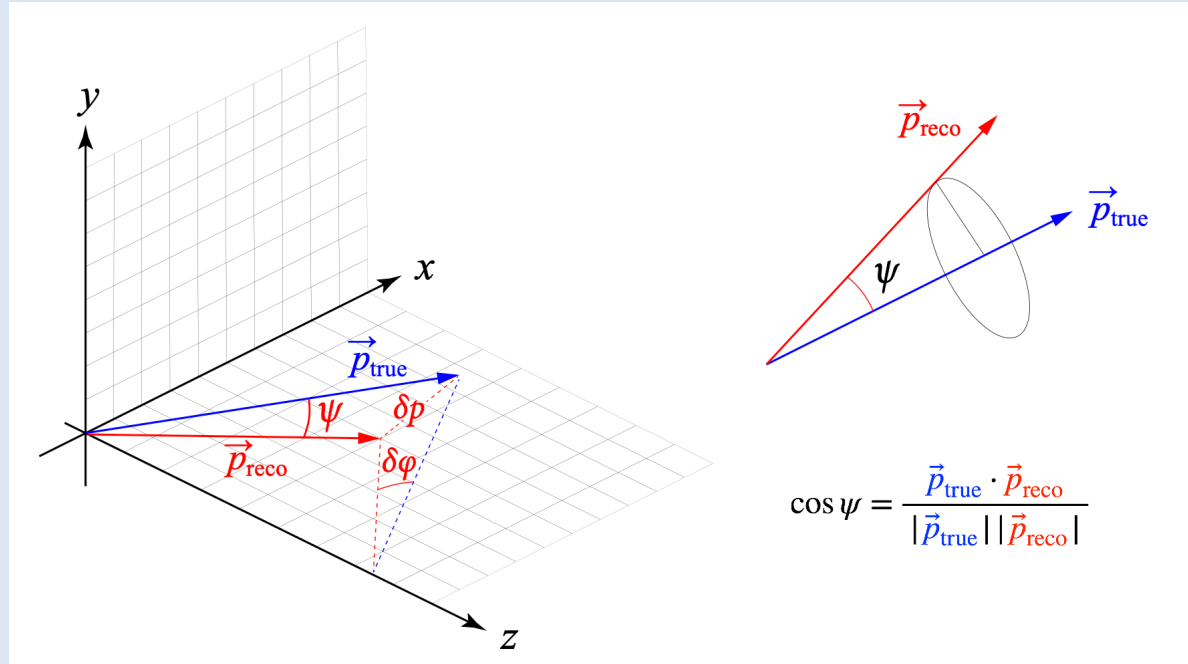


Cherenkov cone emitted by particle

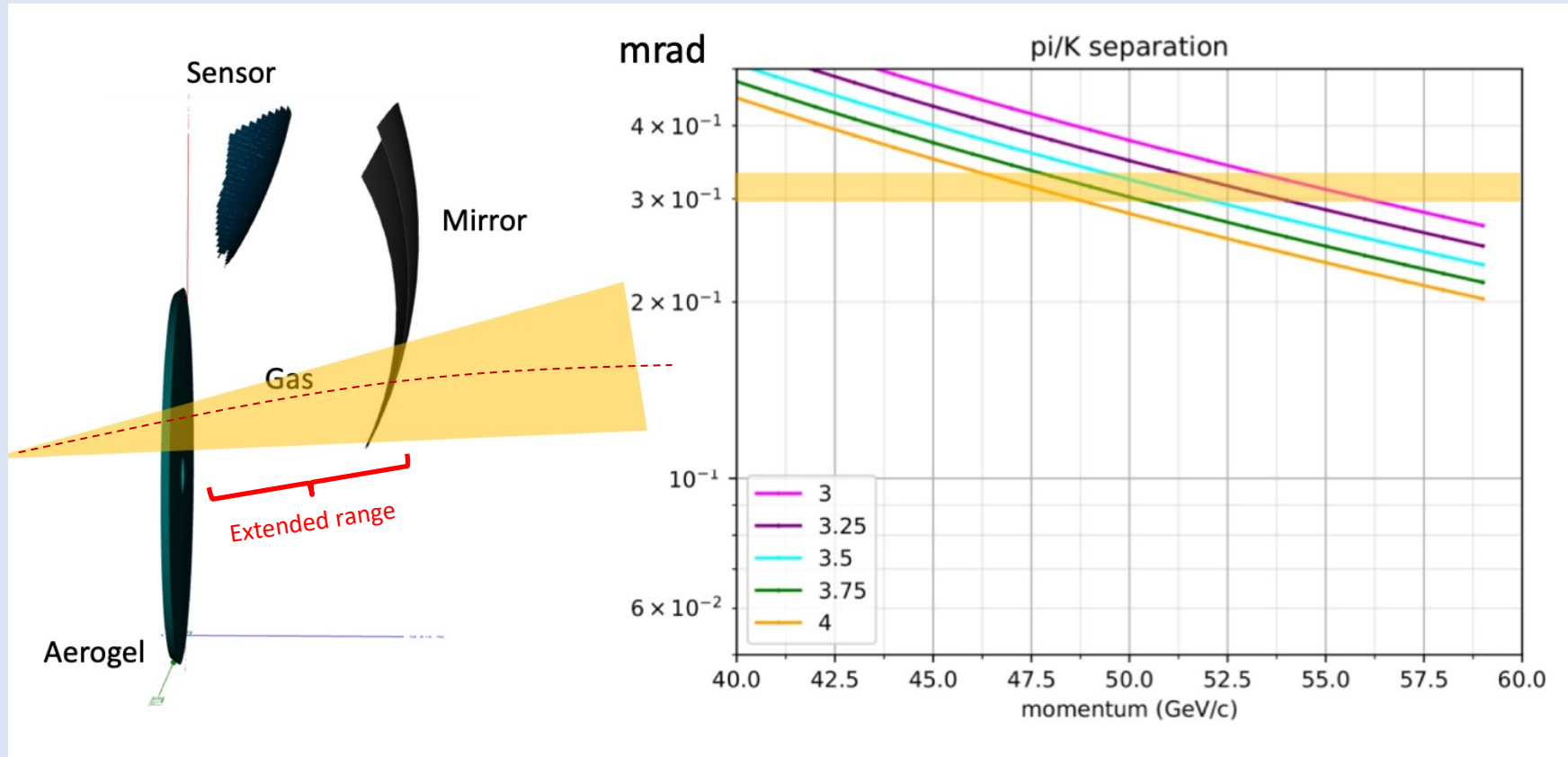


Angular definition is taken in the track local frame (z along \vec{p})

The critical angular resolution is on polar angle



Focusing on the most demanding case: gas radiator at high momenta (small angles)

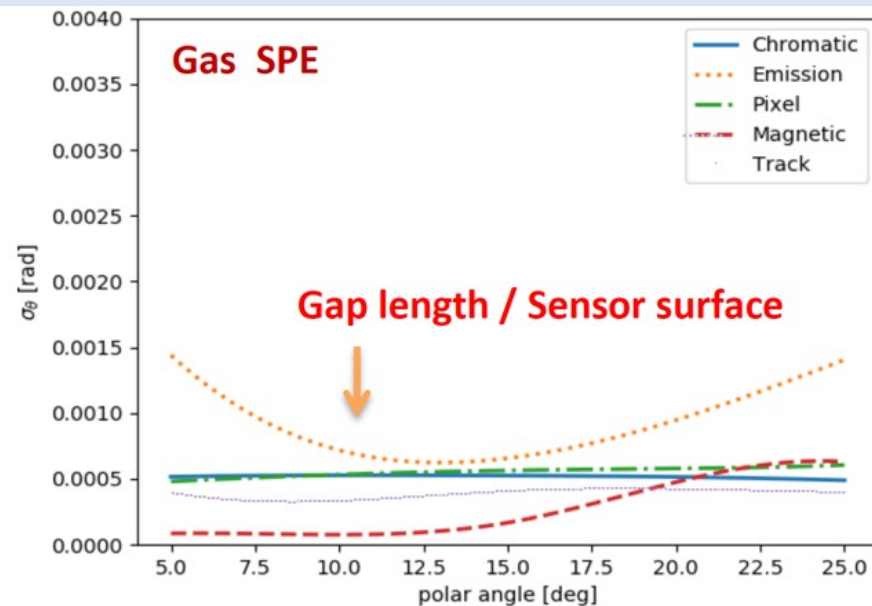
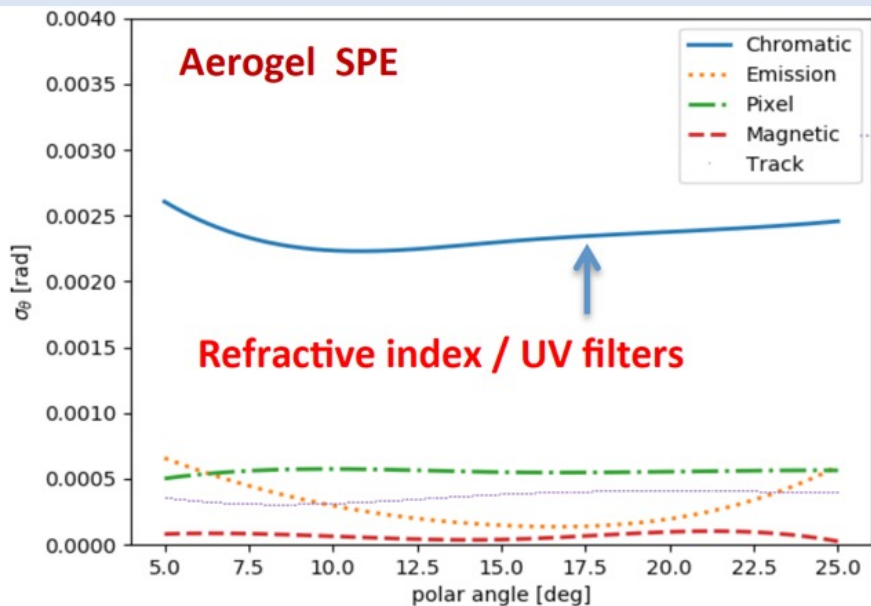


$$\sigma_{\psi} = \sigma_{\text{photon}} / \sqrt{(N)} \oplus \sigma_{\text{correlated}}$$

σ_{emission}

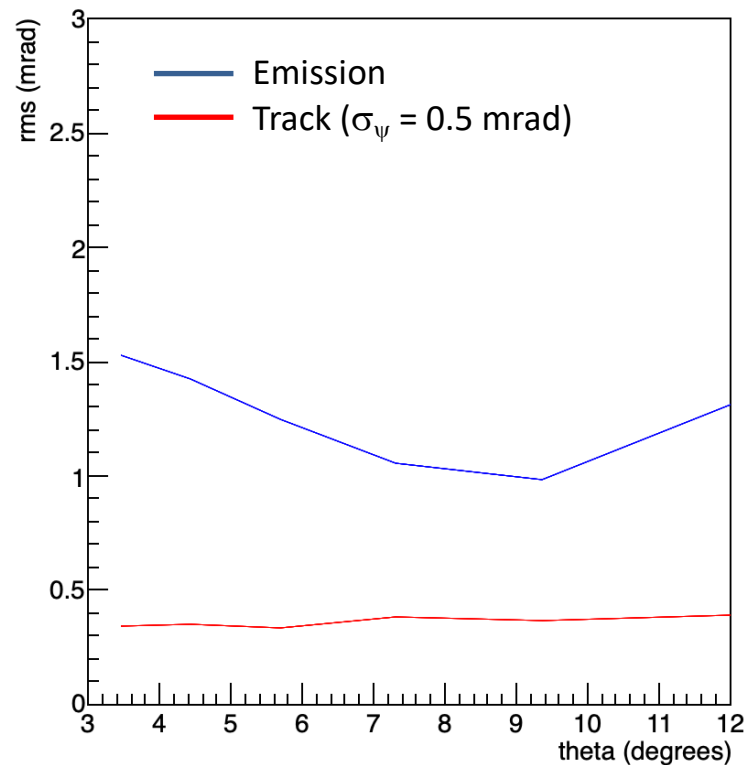
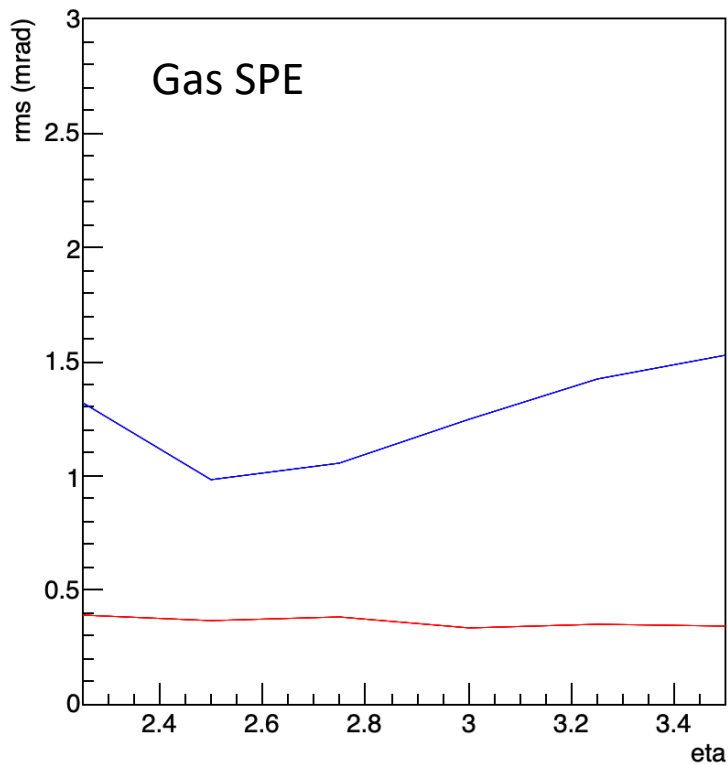
$\sim \sqrt{18}$ for gas

σ_{track}

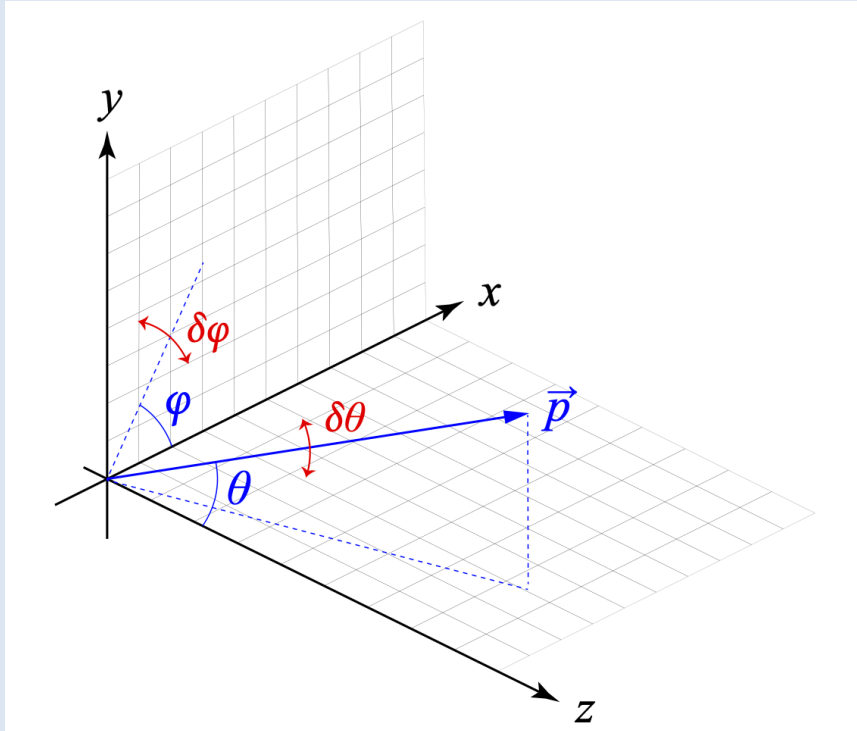
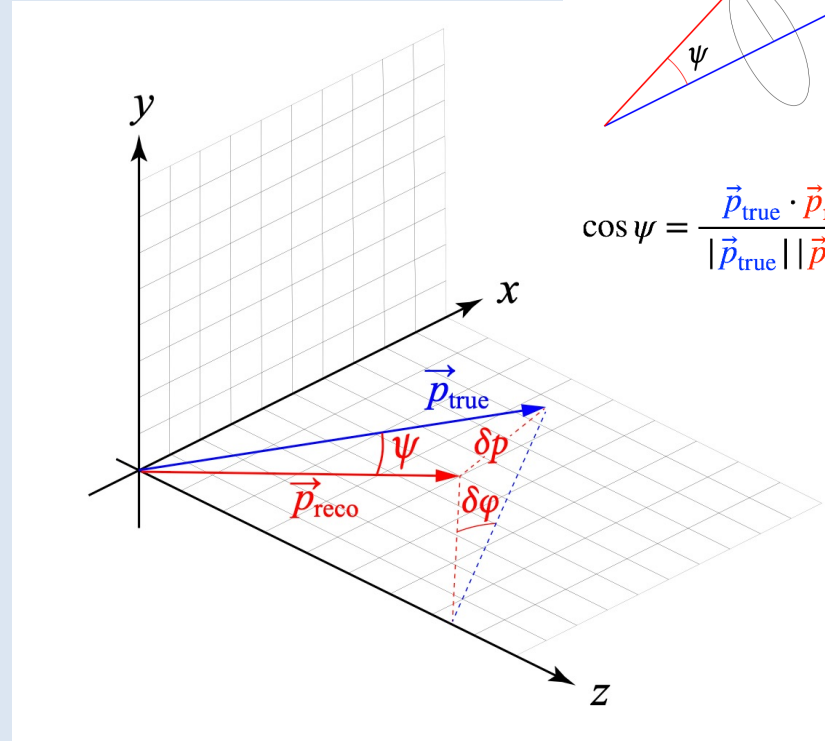


SPE = single photon electron (YR study)

Packed optics in ePIC envelope, with mirror focalization optimized for the small angles



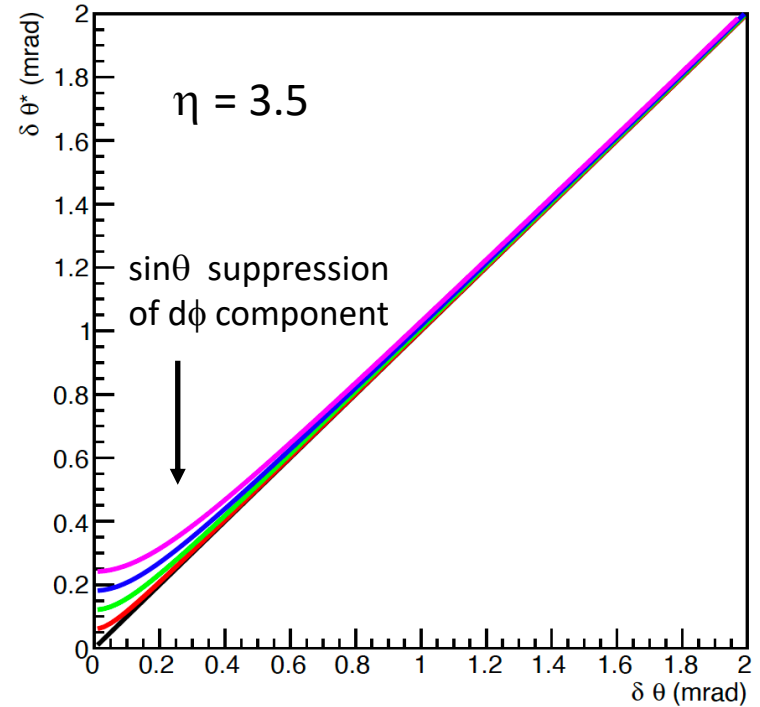
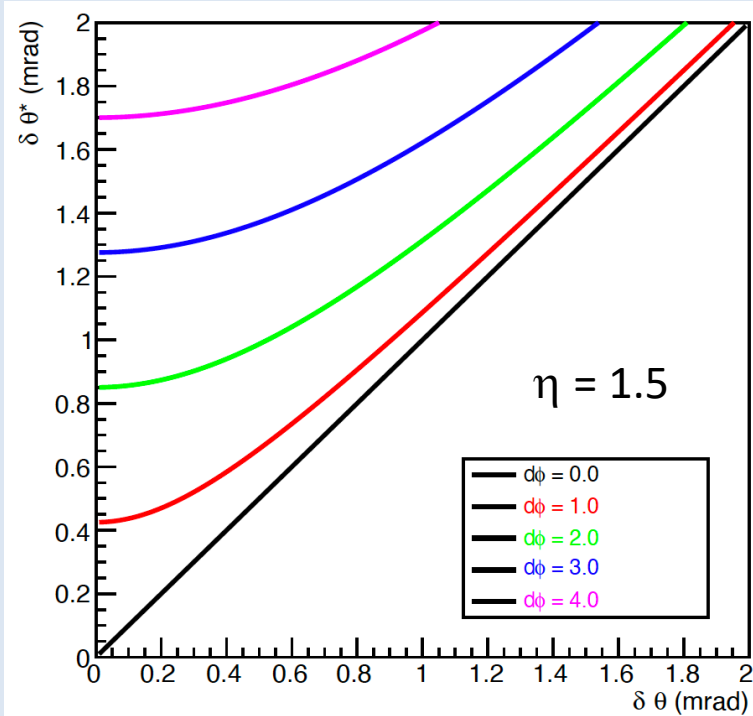
Lab cylindrical coordinate frame

Track local frame (z along \vec{p})

$$\cos \psi = \frac{\vec{p}_{\text{true}} \cdot \vec{p}_{\text{reco}}}{|\vec{p}_{\text{true}}| |\vec{p}_{\text{reco}}|}$$

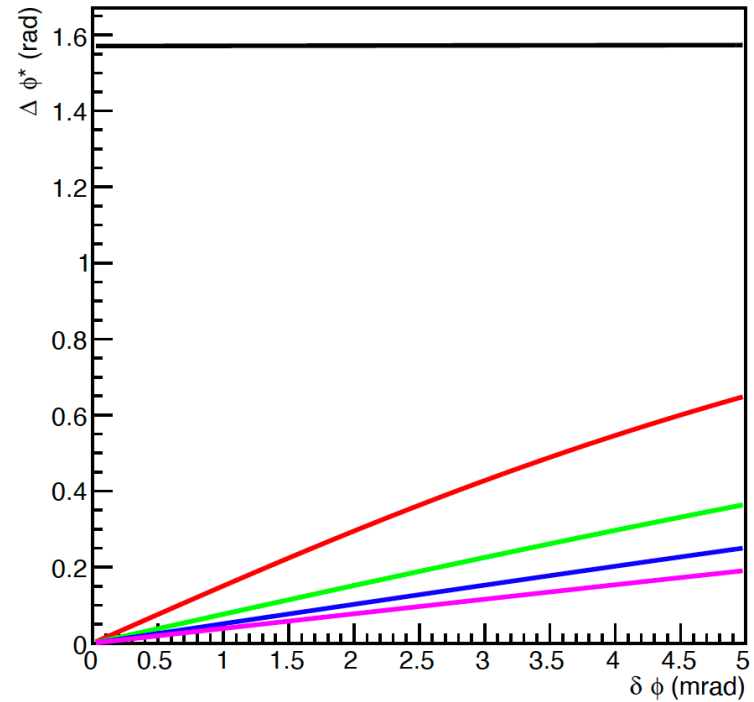
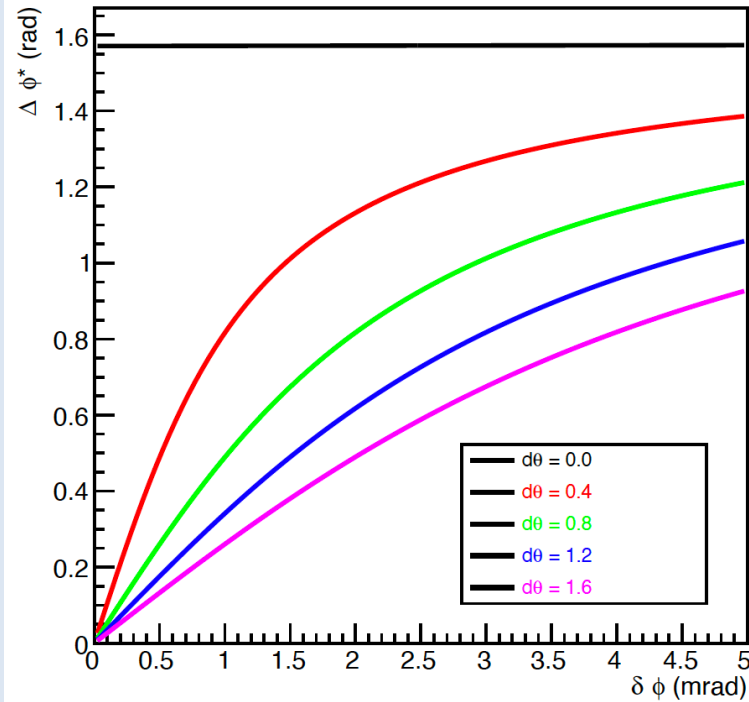
$\delta\theta$ = mis-reconstruction in the lab cylindrical coordinate frame

$\delta\theta^*(\psi)$ = mis-reconstruction in the track local frame (z along \vec{p})



$\delta\phi$ = mis-reconstruction in the lab cylindrical coordinate frame

$\Delta\phi^*$ = mis-reconstruction in the track local frame (z along \vec{p})



- a 0.5 mrad track resolution (mainly on θ) is essential to not spoil the dRICH performance
(there could be a limited tolerance but dRICH focalization is expected to improve)
- dRICH encodes
 - a polar angular information at the level of 0.3 mrad (gas case)
(might be used to improved dRICH or track resolution)
 - a time information that could approach the TOF ballpark
(might be useful to resolve ambiguities or mark wrong trajectories)