# B field impact on forward RICH performance

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# Previous presentations

- 17 May 2021
- 24 May 2021
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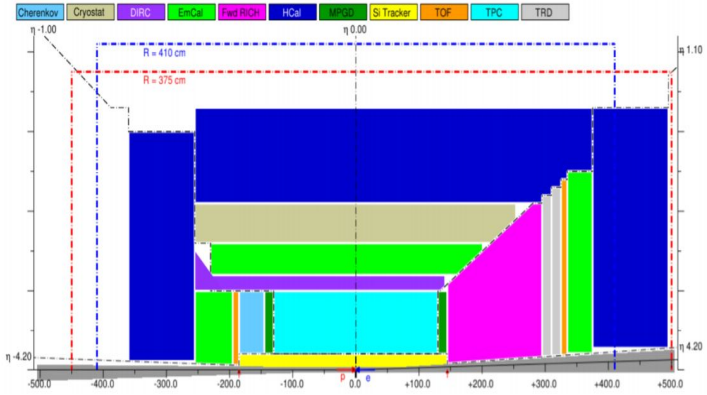
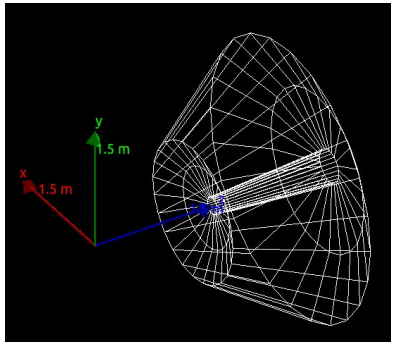
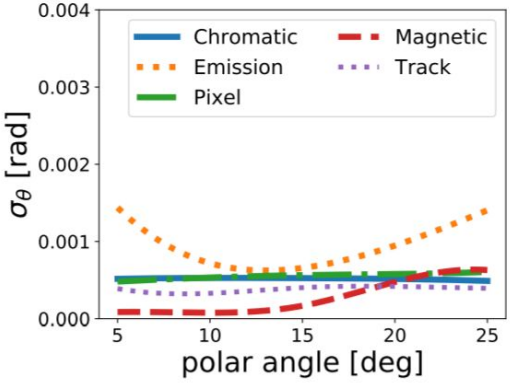
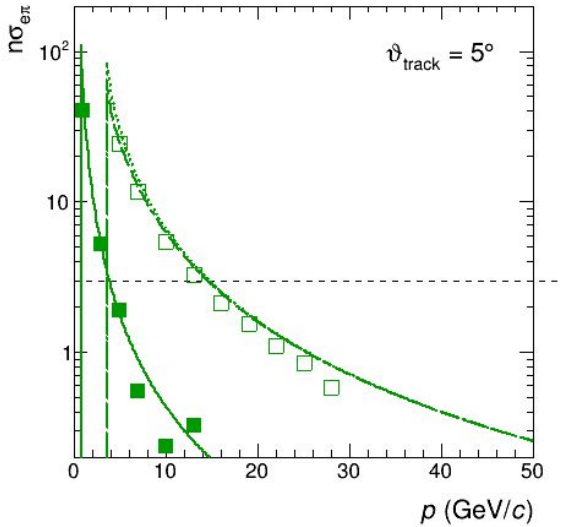
# Can we give an upper limit to what is tolerable?

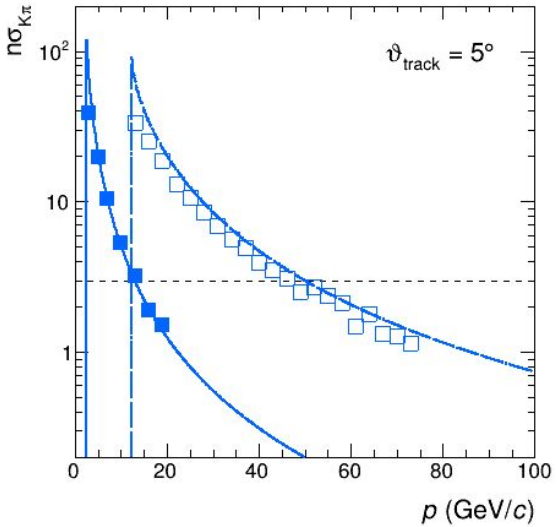
- **use the simple ideal RICH geant4 model**
  - extract B field contribution to 1pe angular resolution
  - the radiator has been put where the full RICH should be
    - overestimated radiator length → overestimated bending / angular smearing
- **use 1pe angular resolution in the dRICH analytical model**
  - replace old B field contribution with new estimate
  - look at how the separation power changes → is it tolerable?

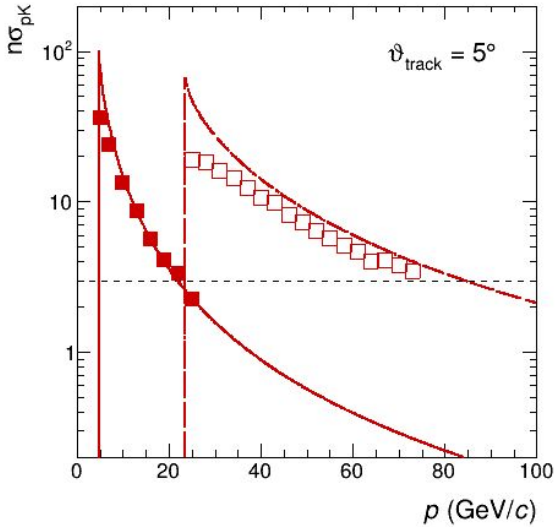


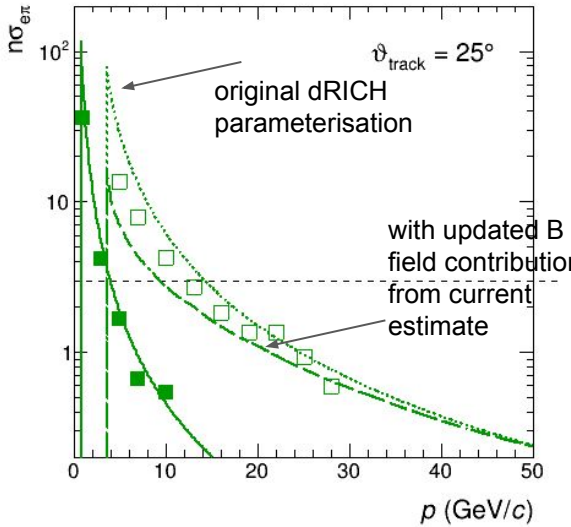



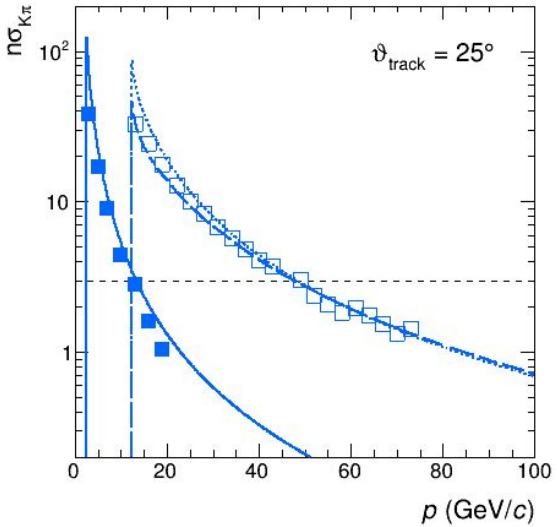



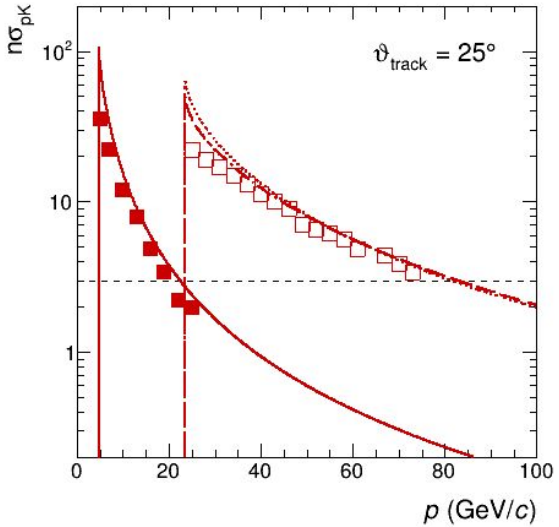

nσeπ
ϑtrack = 5°
p (GeV/c)


nσKπ
ϑtrack = 5°
p (GeV/c)


nσpK
ϑtrack = 5°
p (GeV/c)


nσeπ
ϑtrack = 25°
original dRICH parameterisation
with updated B field contribution from current estimate
p (GeV/c)


nσKπ
ϑtrack = 25°
p (GeV/c)


nσpK
ϑtrack = 25°
p (GeV/c)

- the largest effect is for small η (large $\vartheta$)
- the largest effect is for small p
- no separation-power loss for hadrons at high p
- significantly lower e/π separation power

current B field maps do not seem to significantly impact hadron identification performance of dRICH
on the other hand, limits e/π separation up to ~ 10 GeV/c

beware these test are using ideal track-photon association
broader rings means larger probability of background associations