RICH table

Malte Wilfert

Institut für Kernphysik - Johannes Gutenberg-Universität Mainz

22. October 2013

Data selection

K_0/Λ

- Secondary vertex, 2 outgoing particles
- Opposite charge
- Particle $XX0 < 10$
- $p > 1$ GeV
- $z_{Last} > 350$ cm
- $p_t^+ > 23$ MeV
- Distance vertices $> 2\sigma$
- $m(\pi, \pi) - m(K_0) < 150$ MeV
- $m(\pi, p) - m(\Lambda) < 150$ MeV

ϕ

- 2 additional outgoing particles (prim. vertex)
- opposite charge
- $2 < p > 70$ GeV
- $E_{miss} < 2.5$ GeV
- $z_{Last} > 350$ cm
- $p_t^+ > 23$ MeV
- $m(K, K) - m(\phi) < 150$ MeV

Binning and LH cuts

- 3 θ bins
  0.00, 0.01, 0.04, 0.12
- 13 p bins
  10., 11., 12., 13., 15., 17., 19., 22., 25., 27., 30., 35., 40., 50. GeV/c

Pion:

- $\frac{LH(\pi)}{LH(K)} > 1.$
- $\frac{LH(\pi)}{LH(p)} > 1.$
- $\frac{LH(\pi)}{LH(bg)} > 1.$

Kaon:

- $\frac{LH(K)}{LH(\pi)} > 1.02$
- $\frac{LH(K)}{LH(p)} > 1.$
- $\frac{LH(K)}{LH(bg)} > 1.24$

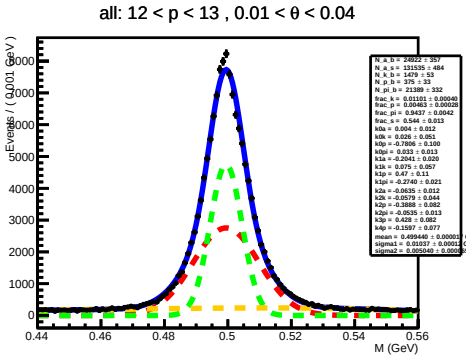
Proton:

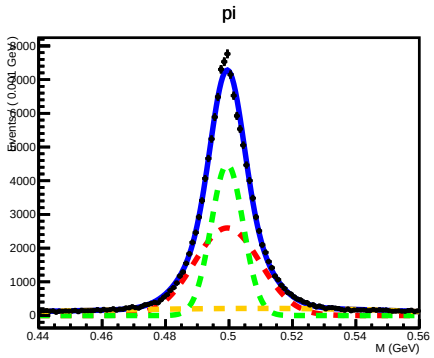
- $p < p_{thr}$
- $\frac{LH(bg)}{LH(\pi)} > 1.$
- $\frac{LH(bg)}{LH(K)} > 1.$

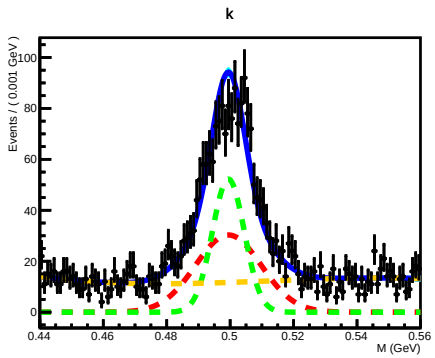
- $p > p_{thr}$
- $\frac{LH(p)}{LH(\pi)} > 1.$
- $\frac{LH(p)}{LH(K)} > 1.$
- $\frac{LH(p)}{LH(bg)} > 1.$

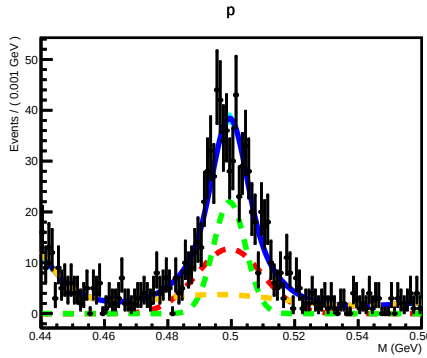
Fit function

- K_0: 2 Gaussian + Polynomial
- Λ: 2 Gaussian + $(x - thr)^n \exp(-a(x - thr))$
- ϕ: convolution Breit-Wigner and Gaussian + $(x - thr)^n \exp(-a(x - thr))$



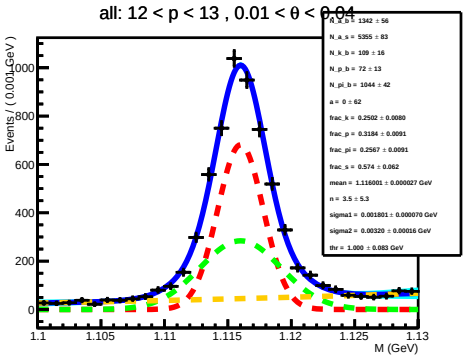


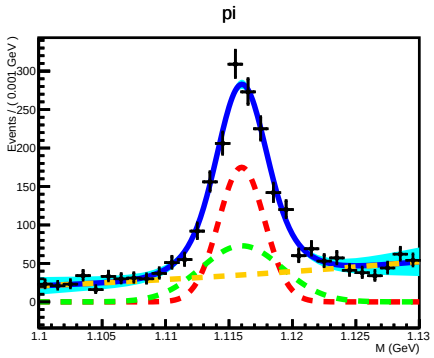


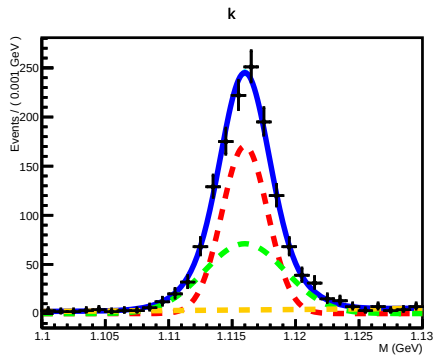


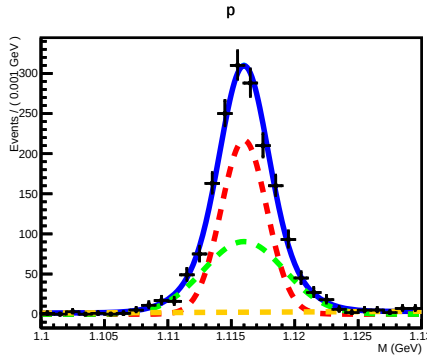
Fit function

- K_0: 2 Gaussian + Polynomial
- Λ: 2 Gaussian + $(x - thr)^n \exp(-a(x - thr))$
- ϕ: convolution Breit-Wigner and Gaussian + $(x - thr)^n \exp(-a(x - thr))$



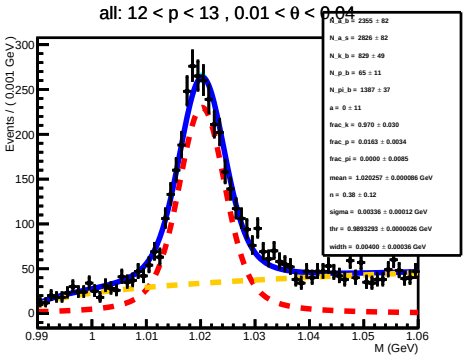


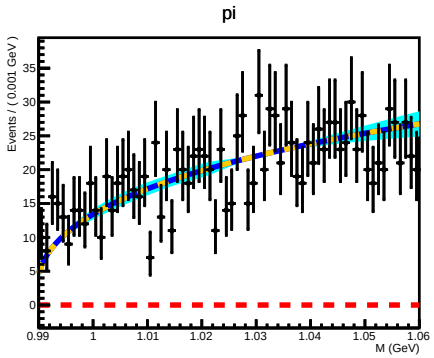


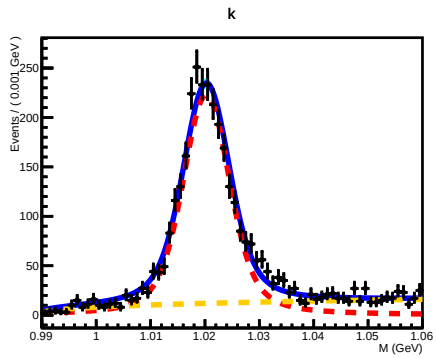


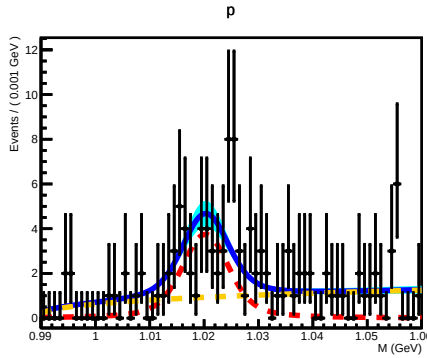
Fit function

- K_0: 2 Gaussian + Polynomial
- Λ: 2 Gaussian + $(x - thr)^n \exp(-a(x - thr))$
- ϕ: convolution Breit-Wigner and Gaussian + $(x - thr)^n \exp(-a(x - thr))$

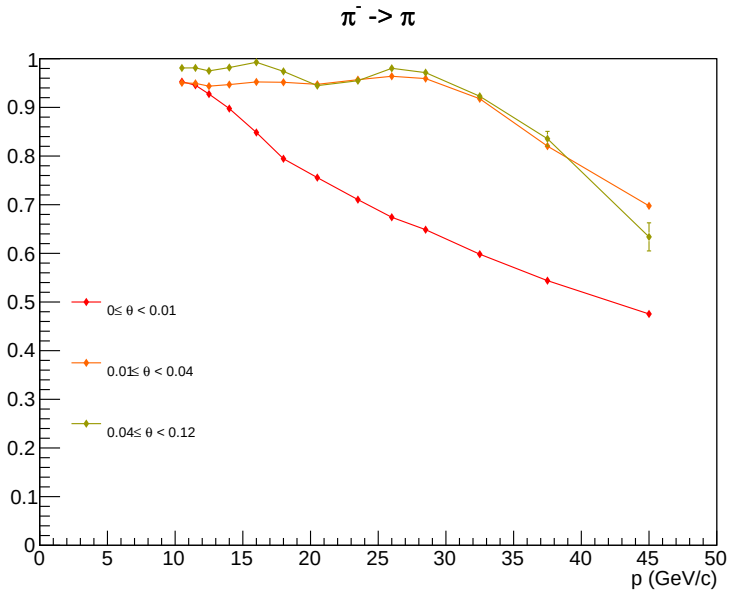


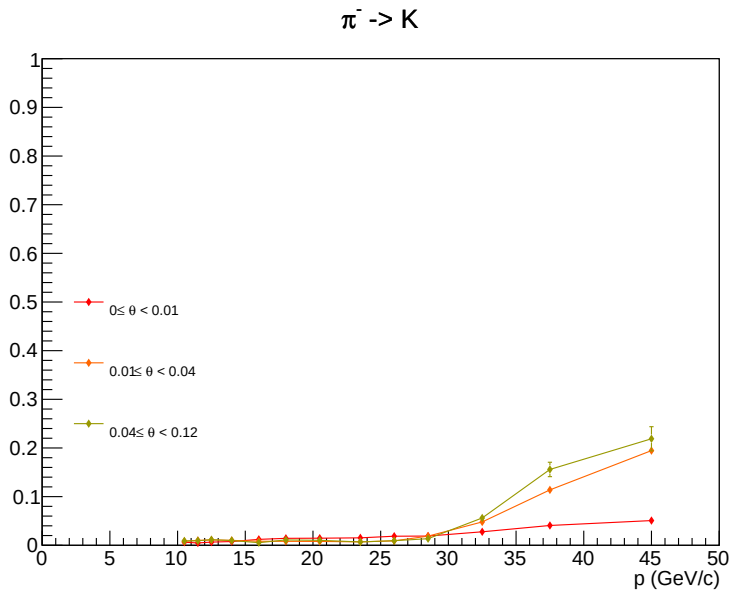


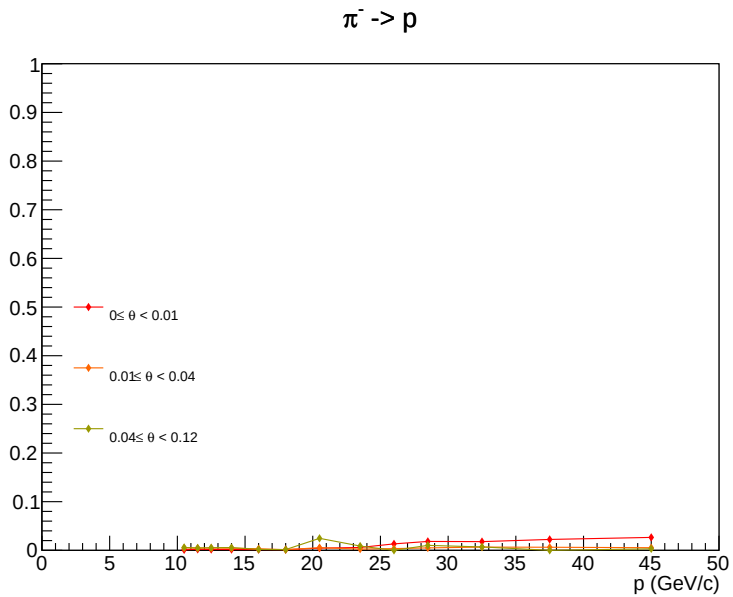




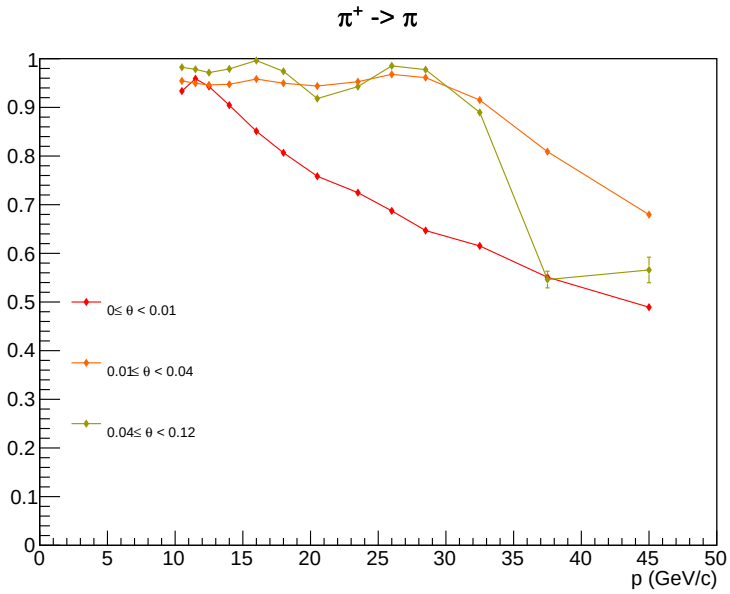
RICH π^-

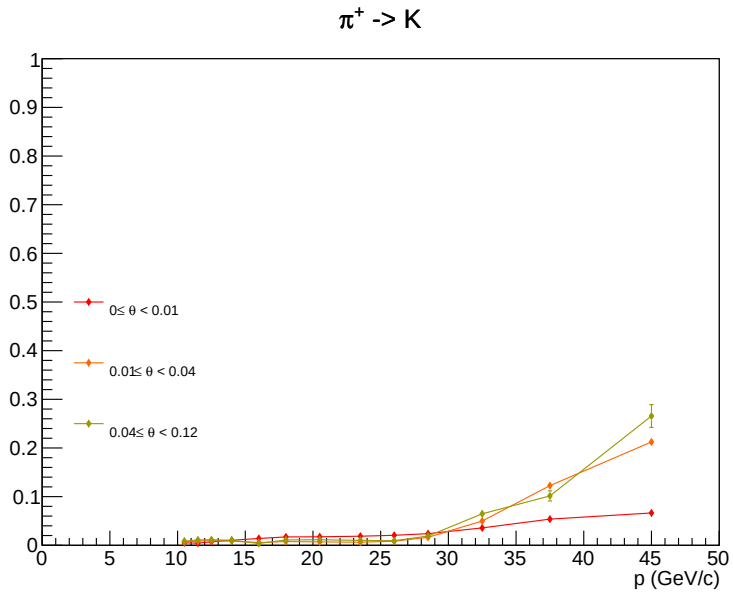

π- -> π
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

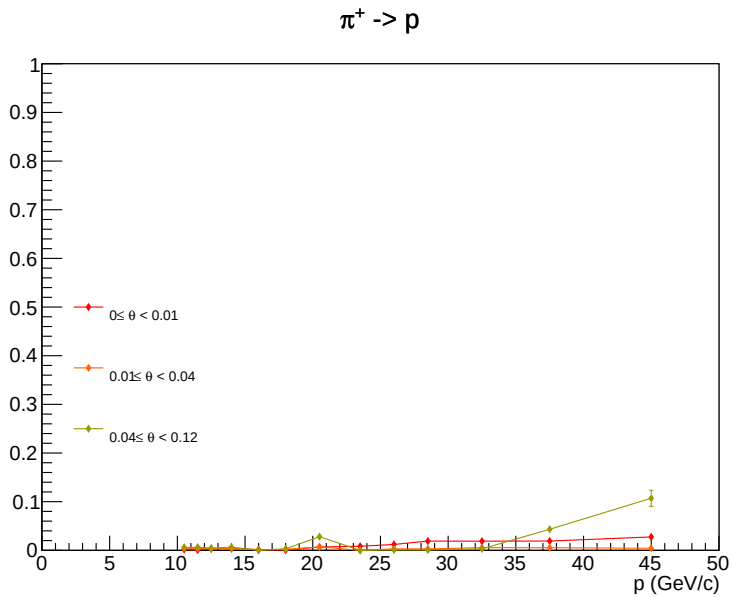

π- -> K
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


π- -> p
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

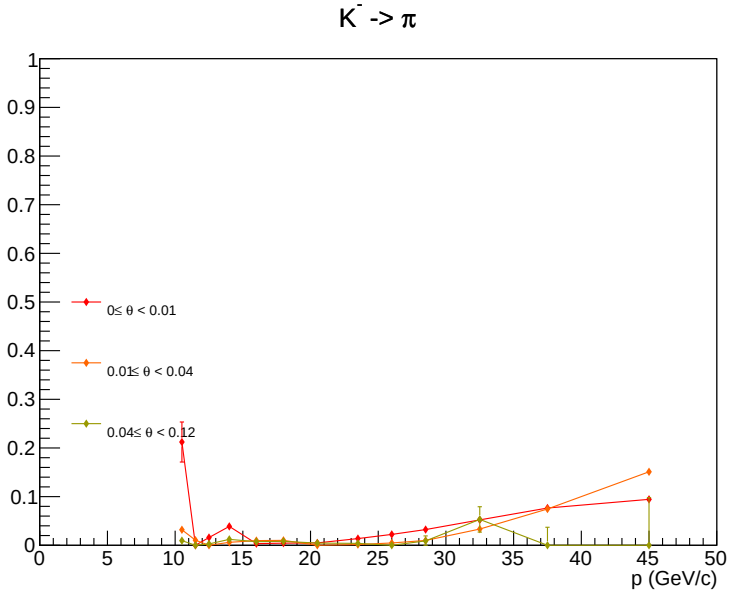
RICH π^+

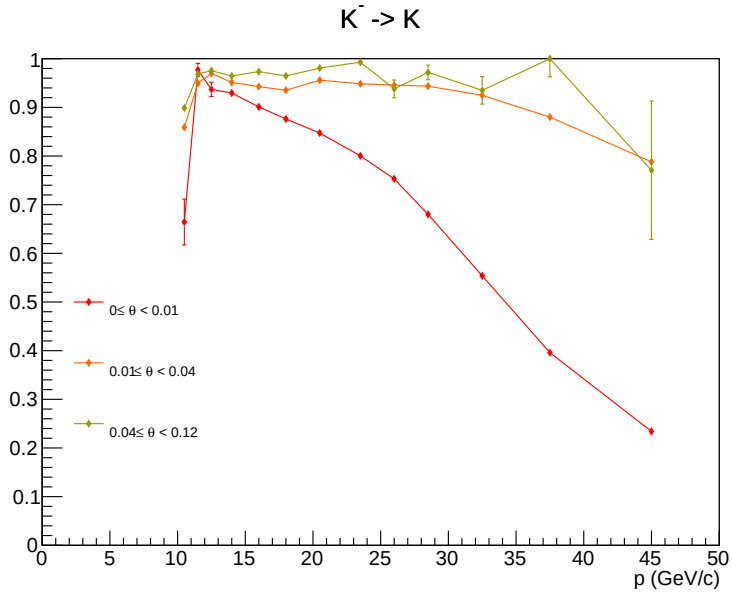

π+ -> π
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

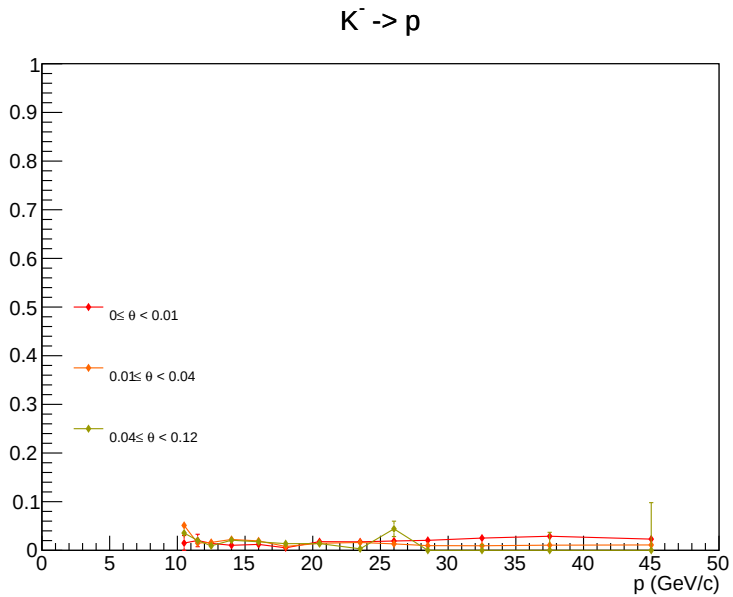

π+ -> K
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


π+ -> p
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

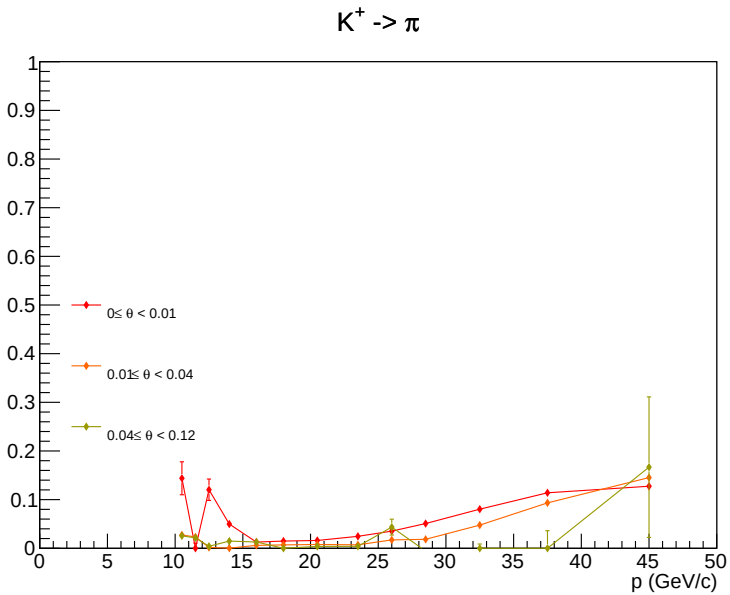
RICH K^-

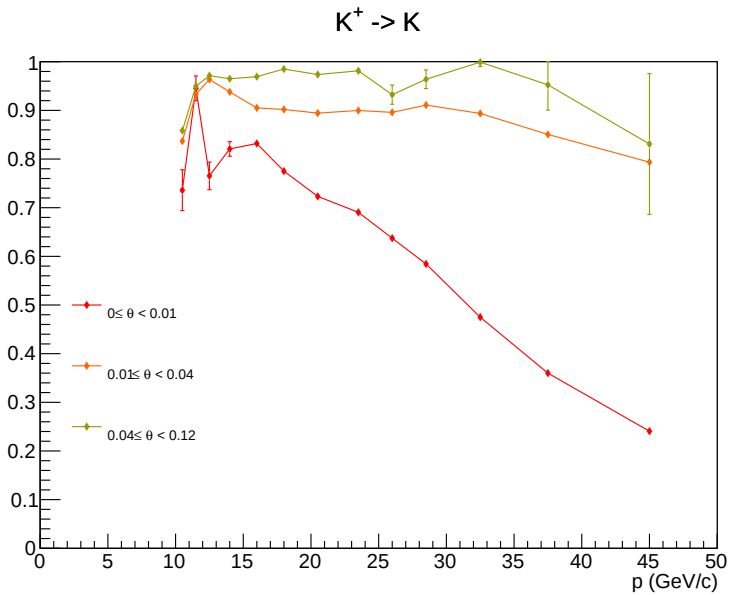

K⁻ -> π
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

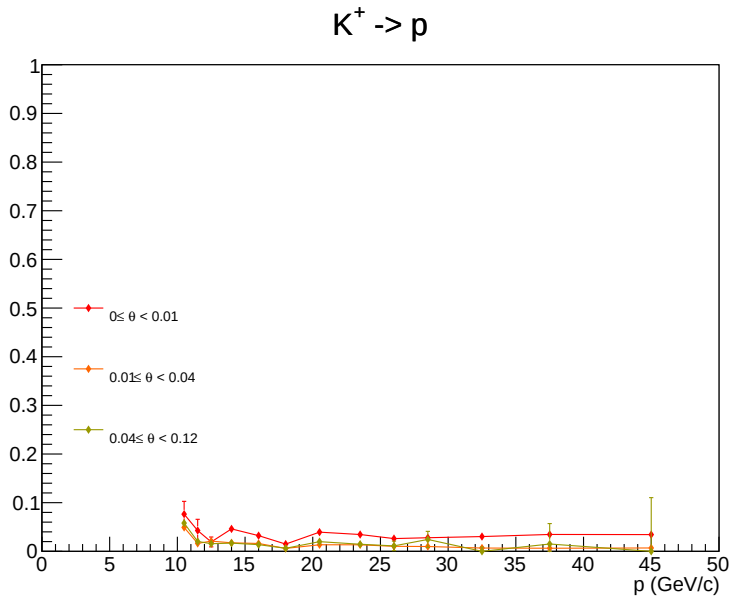

K⁻ -> K
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


K⁻ -> p
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

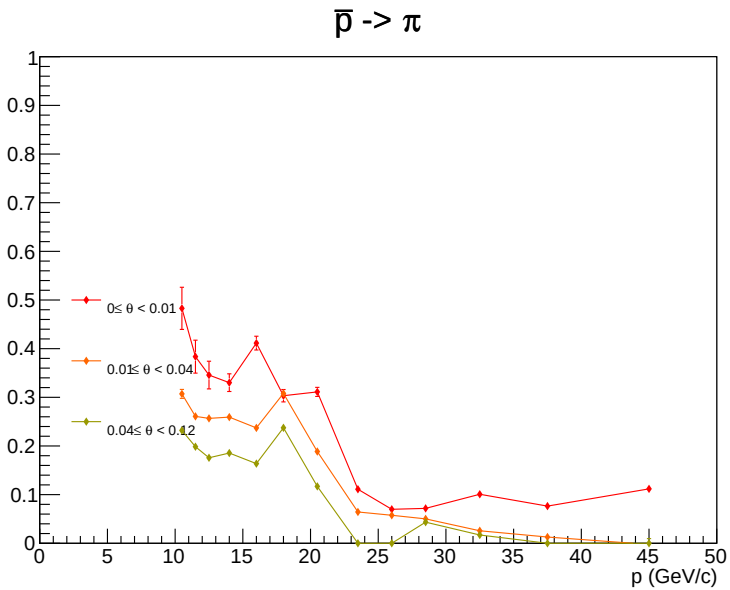
RICH K^+

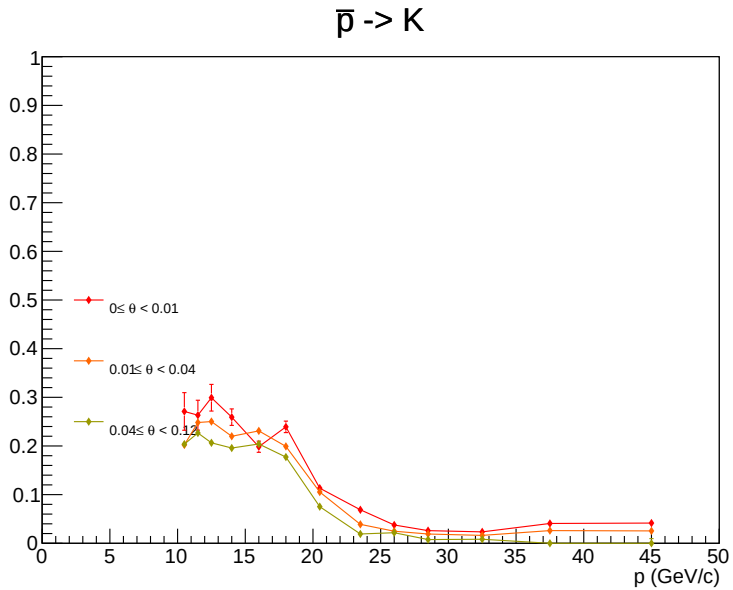

K+ -> π
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

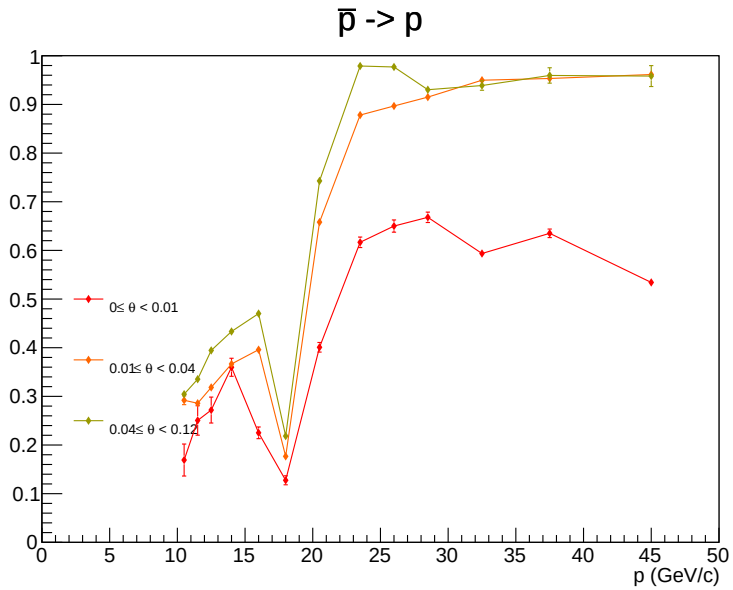

K+ -> K
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


K+ -> p
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

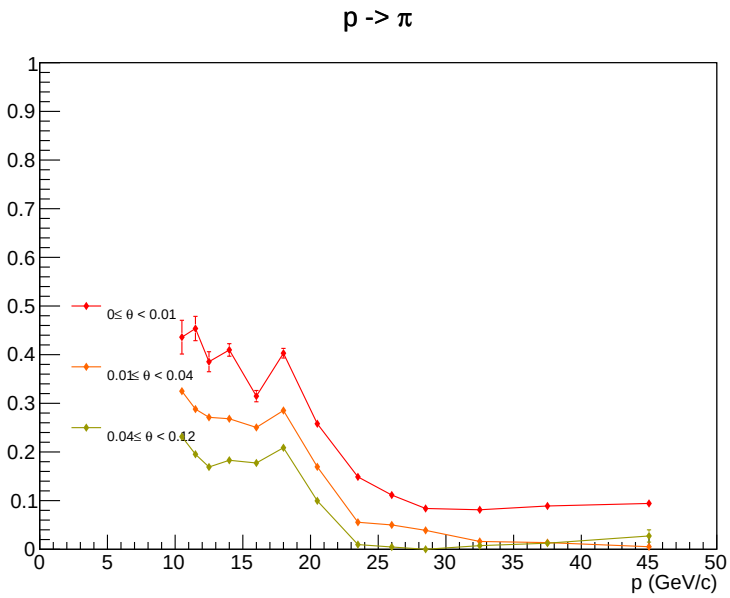
RICH $\bar{p}$

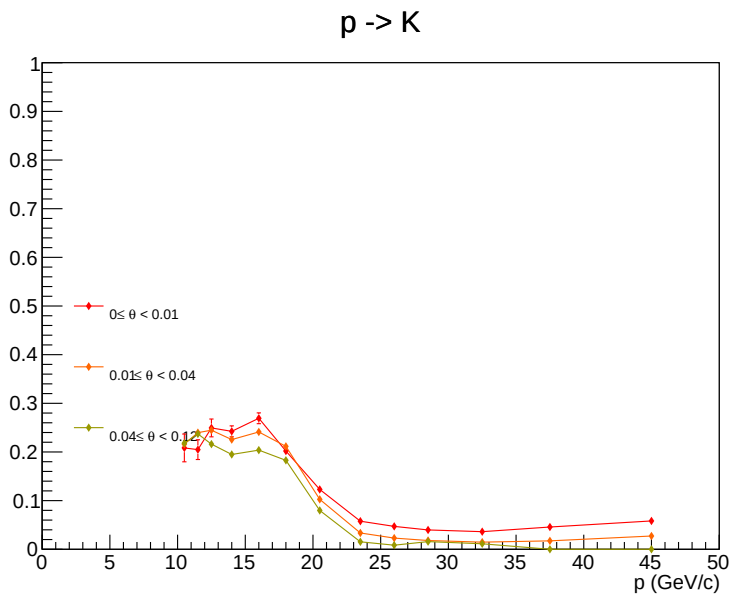

p̄ -> π
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

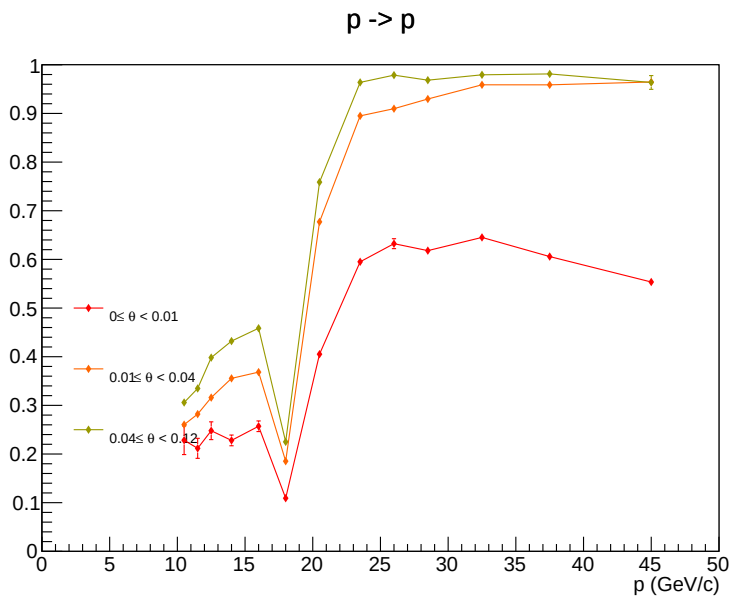

p̄ -> K
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


p̄ -> p
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)

RICH p


p -> π
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


p -> K
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)


p -> p
0≤ θ < 0.01
0.01≤ θ < 0.04
0.04≤ θ < 0.12
p (GeV/c)