Pions and kaons purities

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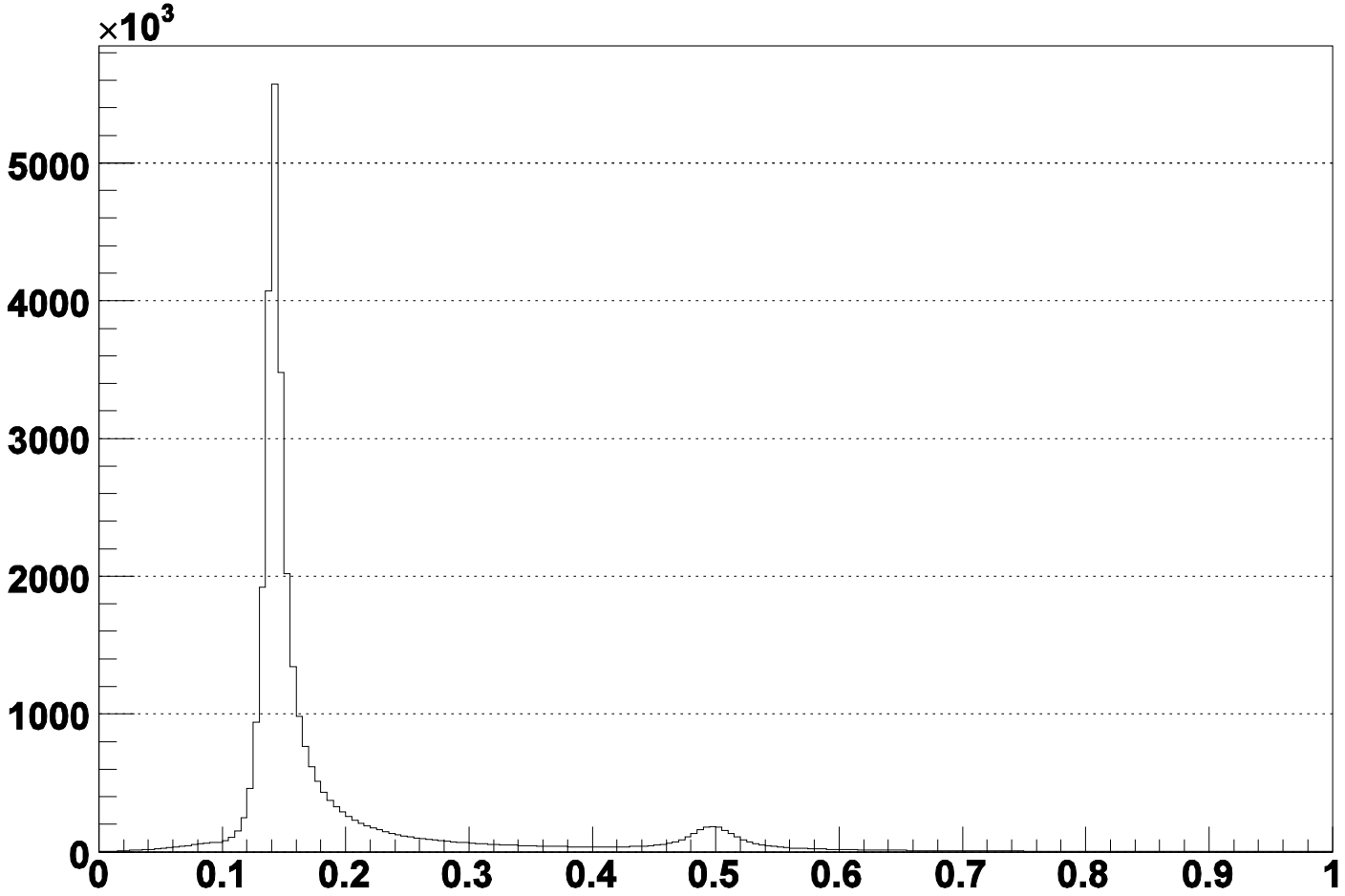
- Standard cuts for DIS
- Standard cuts for SIDIS
- Standard cuts for RICH ID (p, LH)

Final sample:

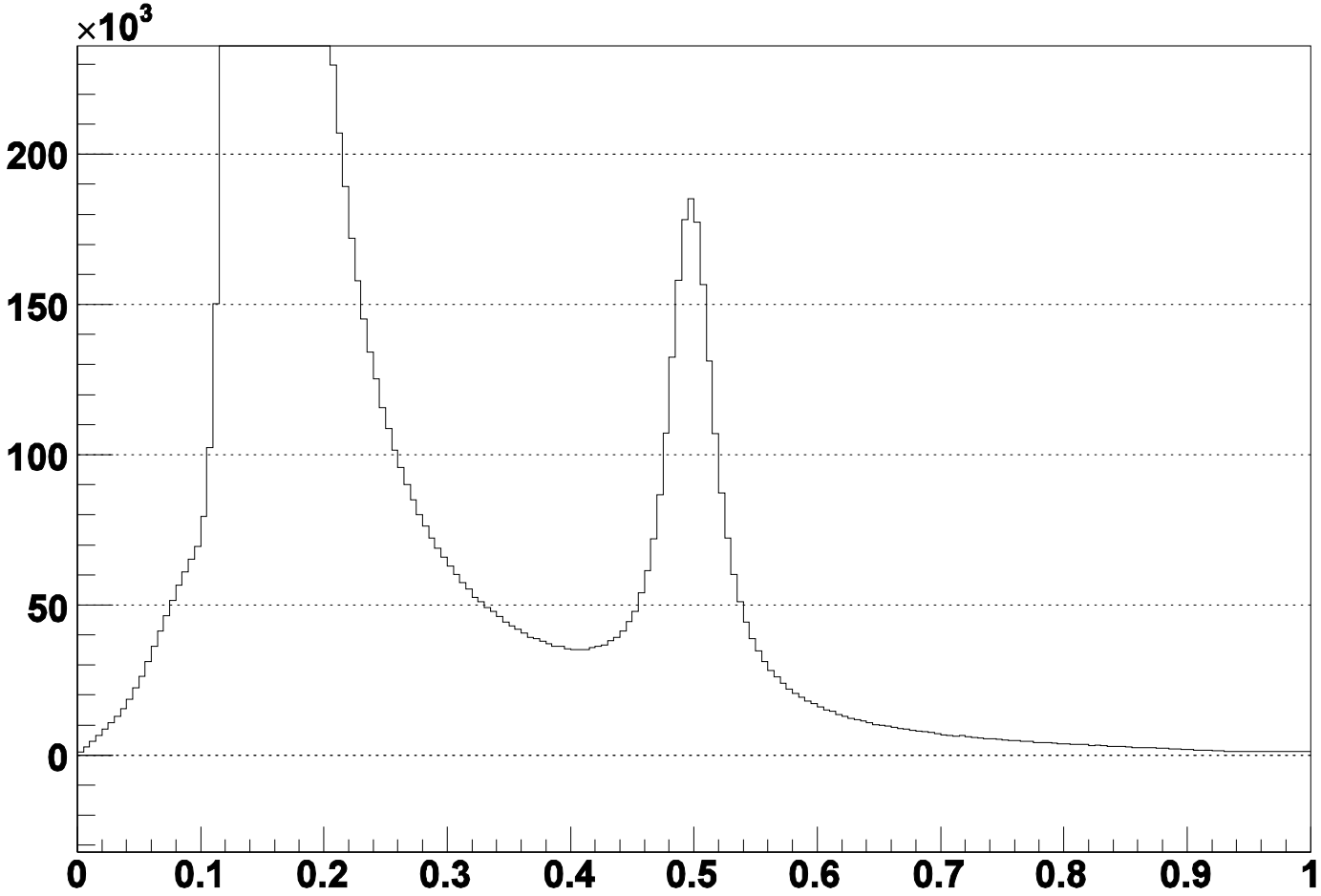
$N(K^+) = 1.7*10^6$ $N(\pi^+) = 1.3*10^7$

$N(K^-) = 1.2*10^6$ $N(\pi^-) = 1.1*10^7$

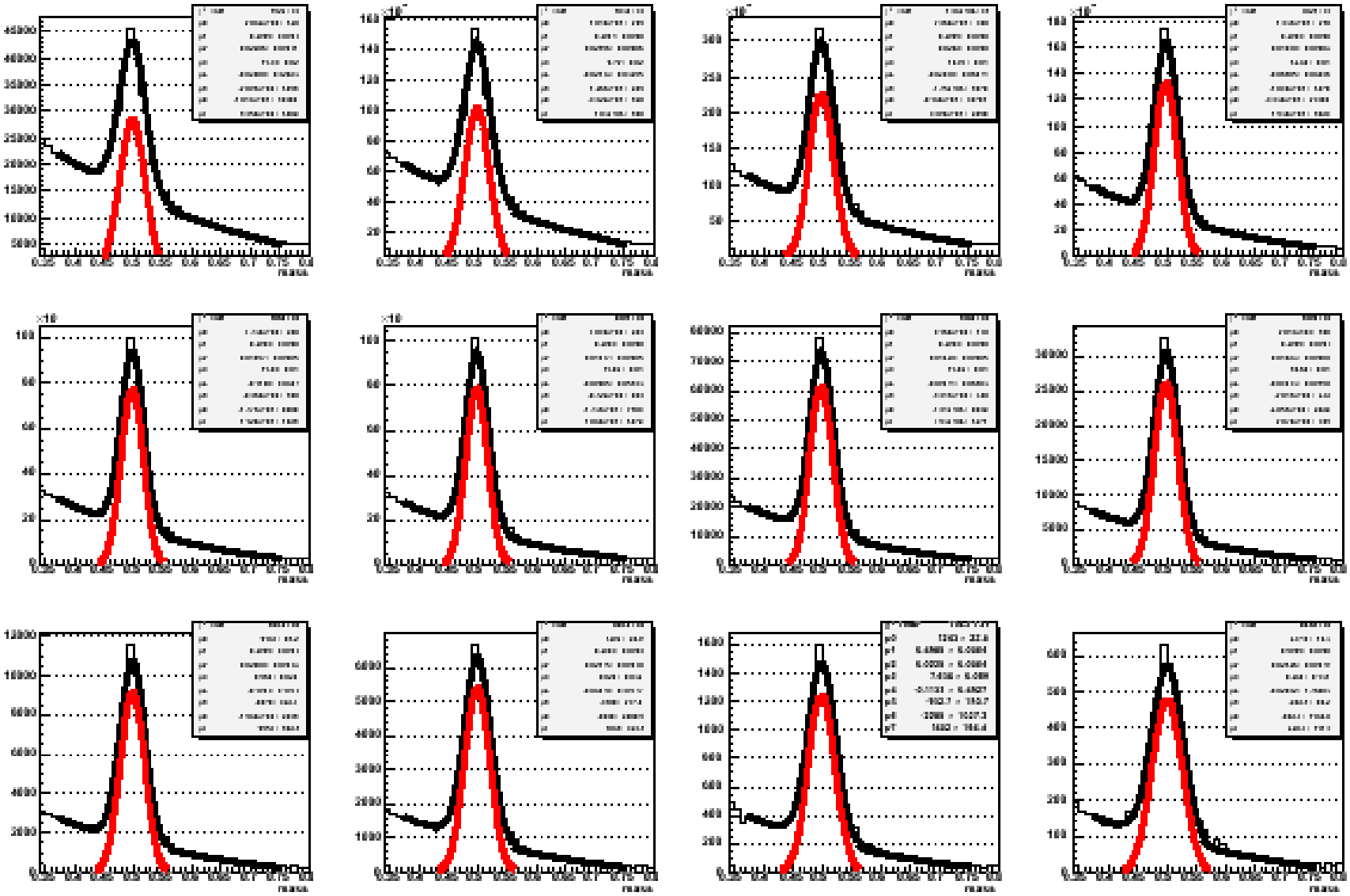
Pions & kaons mass from RICH



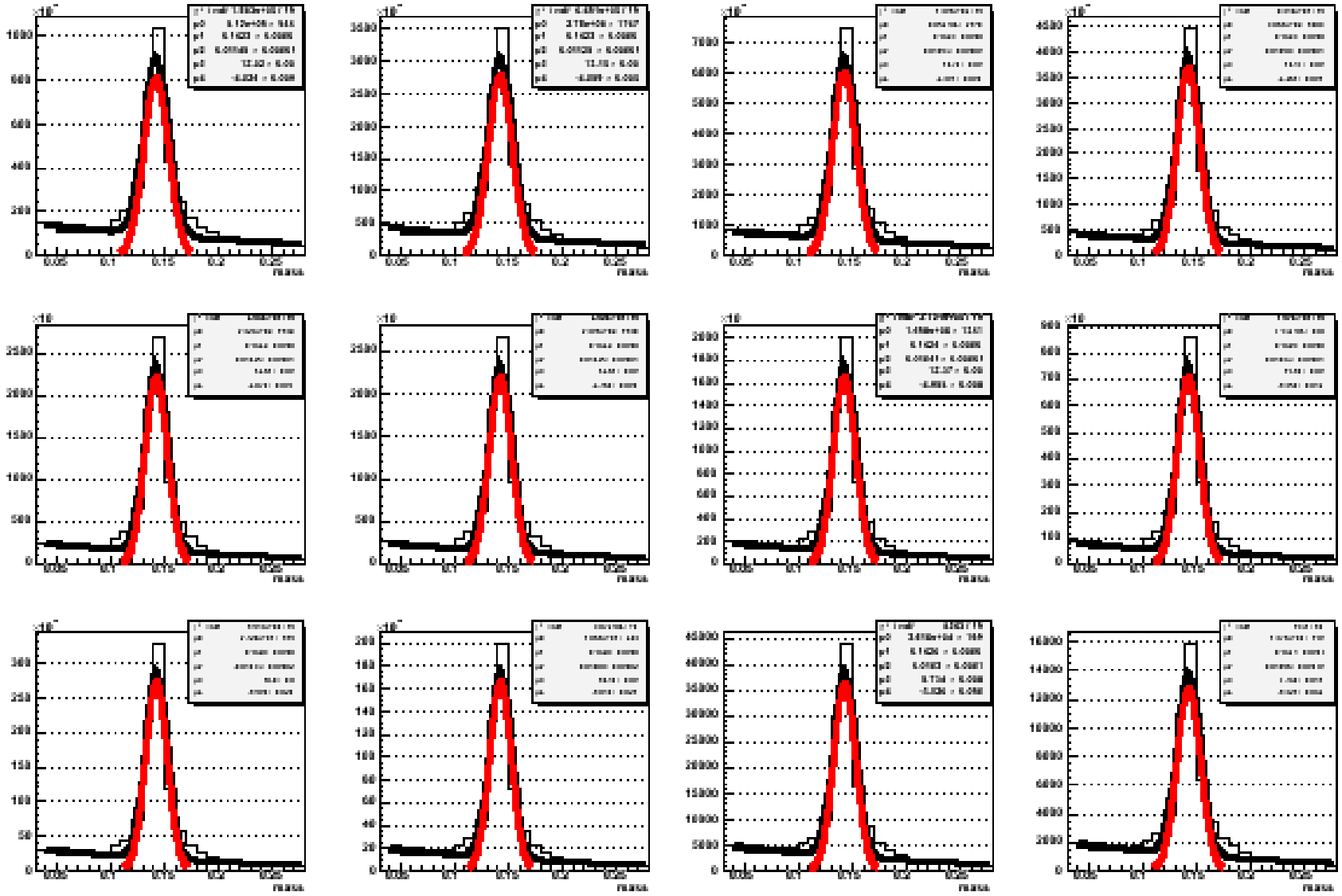
zoom



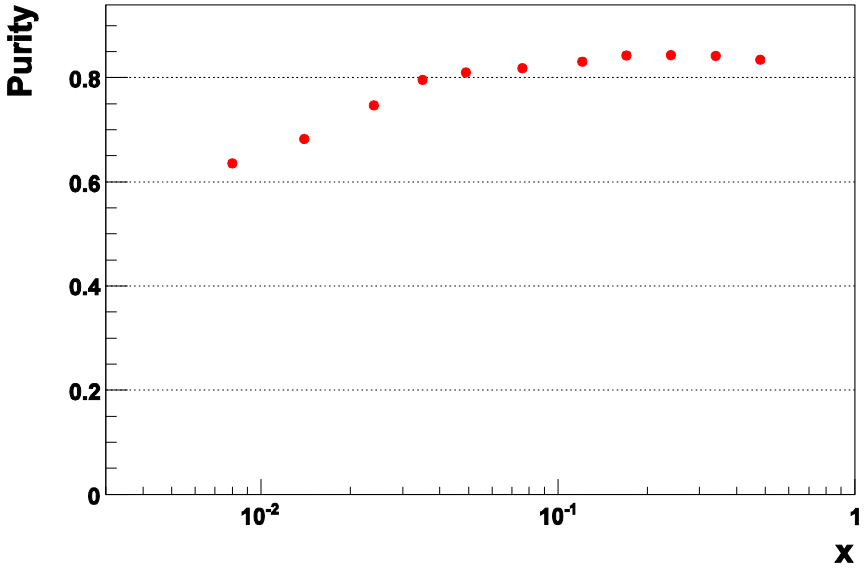
Fits in each x-bin (Kaons)

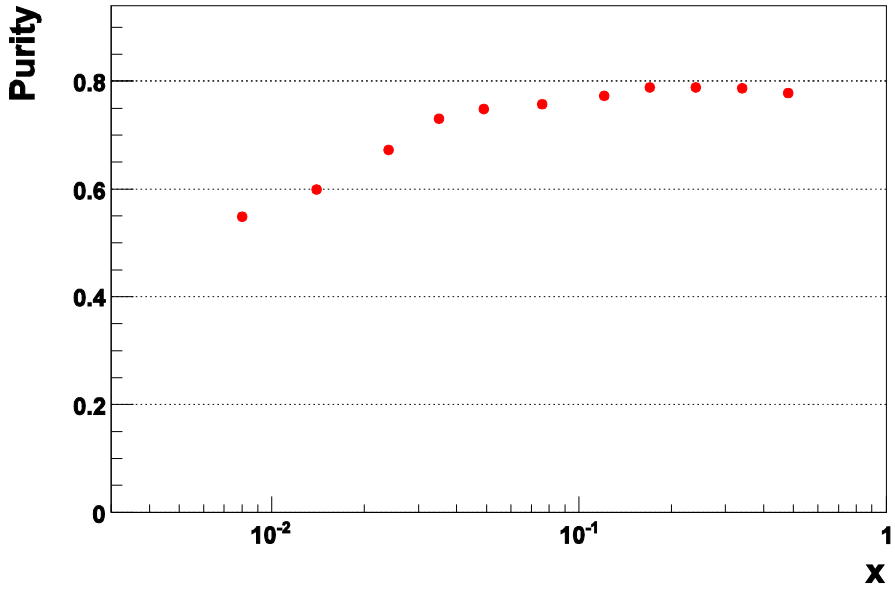


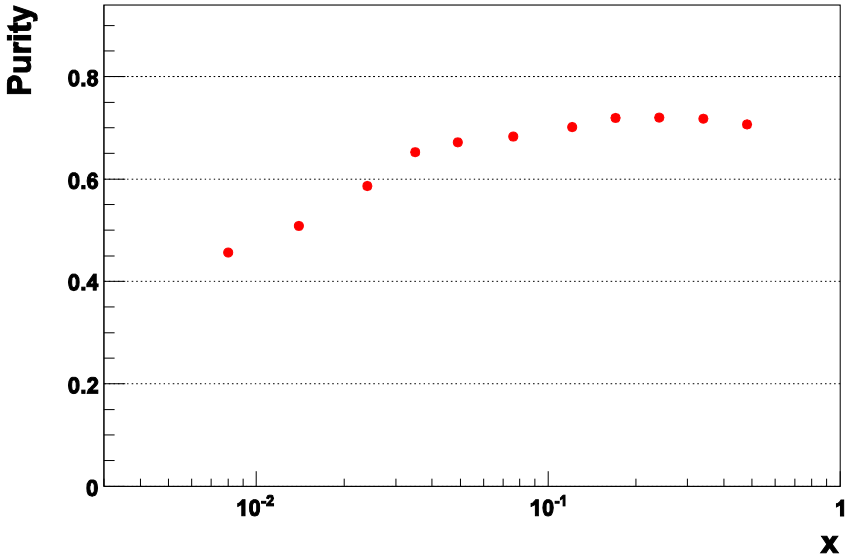
Fits in each x-bin (Pions)



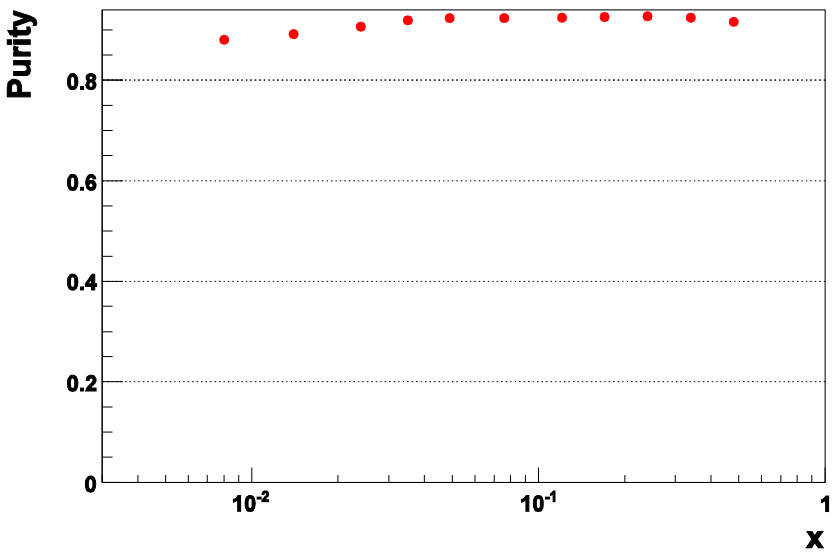
Purity K

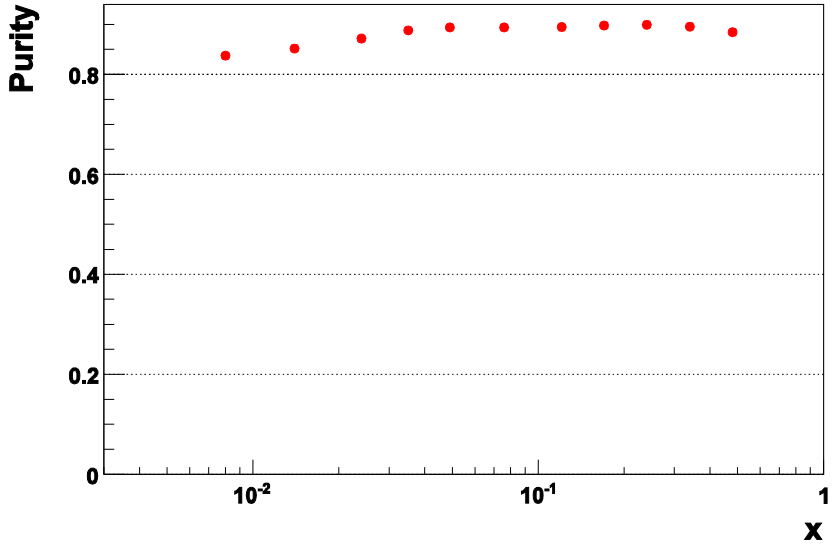

Purity
0.8
0.6
0.4
0.2
0
10^{-2}
10^{-1}
1
x

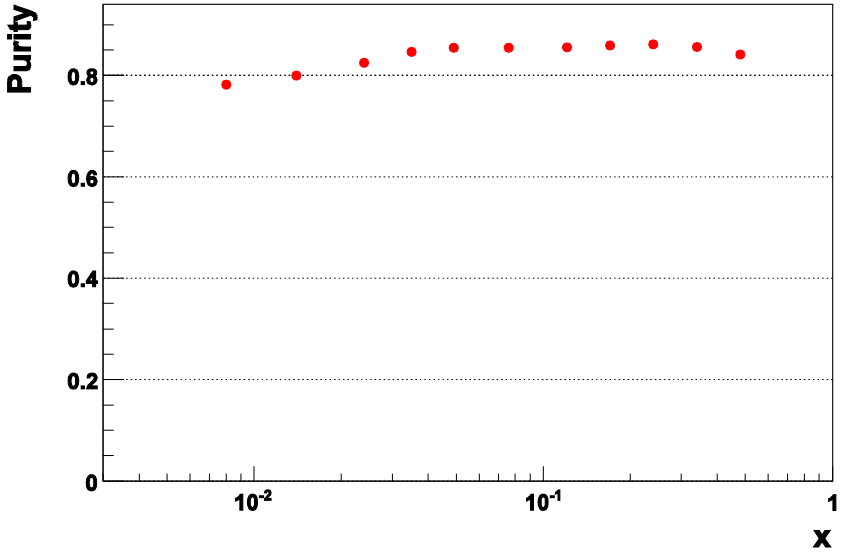

Purity
0.8
0.6
0.4
0.2
0
10^{-2}
10^{-1}
1
x


Purity
0.8
0.6
0.4
0.2
0
10^{-2}
10^{-1}
1
x

Purity pi


Purity
0.8
0.6
0.4
0.2
0
10^{-2}
10^{-1}
1
x


Purity
0.8
0.6
0.4
0.2
0
10^{-2}
10^{-1}
1
x


Purity
0.8
0.6
0.4
0.2
0
10^{-2}
10^{-1}
1
x

How to correct asymmetries?

$$A_{\pi}^{M} = p_{\pi} A_{\pi}^{T} + \left(1 - p_{\pi}\right) A_{K}^{T}$$

$$A_{K}^{M} = p_{K} A_{K}^{T} + \left(1 - p_{K}\right) A_{\pi}^{T}$$

A_{π}^{M} – mesured pions asymmetry

A_{π}^{T} – true pions asymmetry

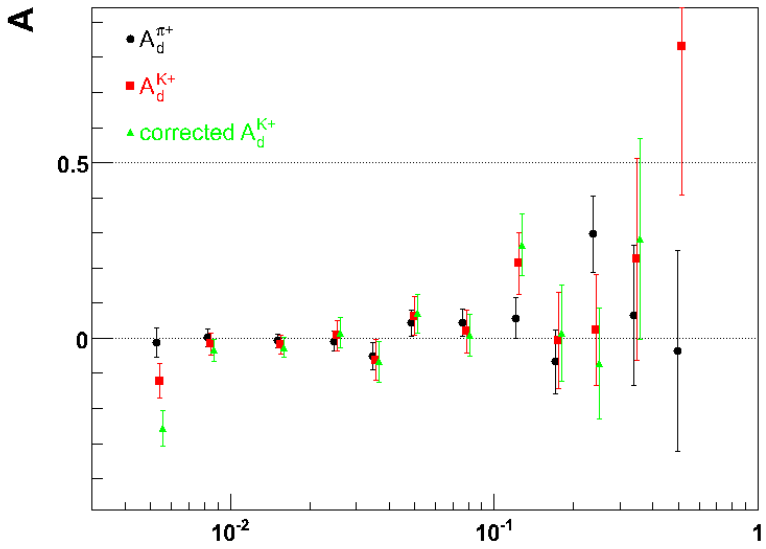
p_{π} – pions purity

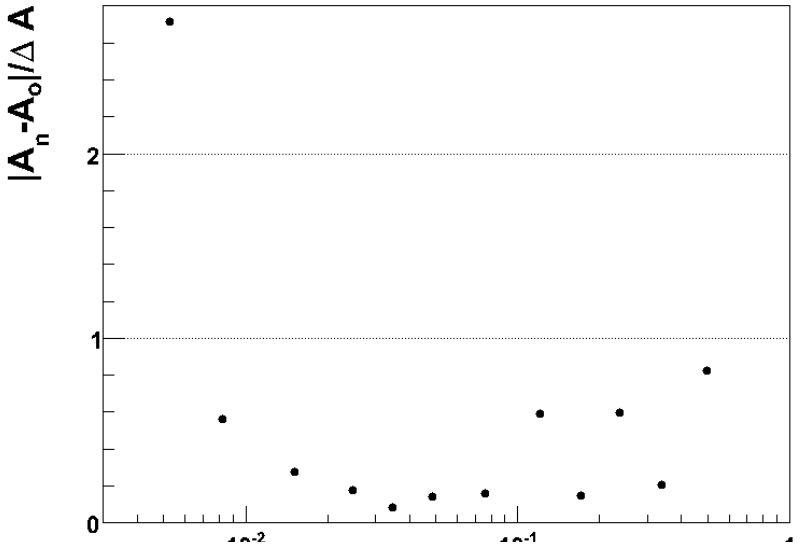
p_{K} – kaons purity

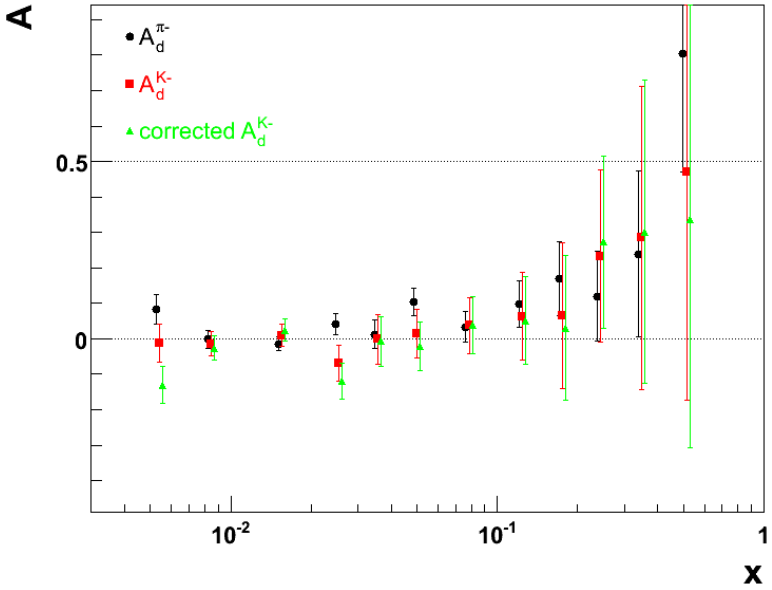
$$A_{K}^{T} = \frac{p_{\pi}}{p_{\pi} + p_{K} - 1} A_{K}^{M} - \frac{1 - p_{K}}{p_{\pi} + p_{K} - 1} A_{\pi}^{M}$$

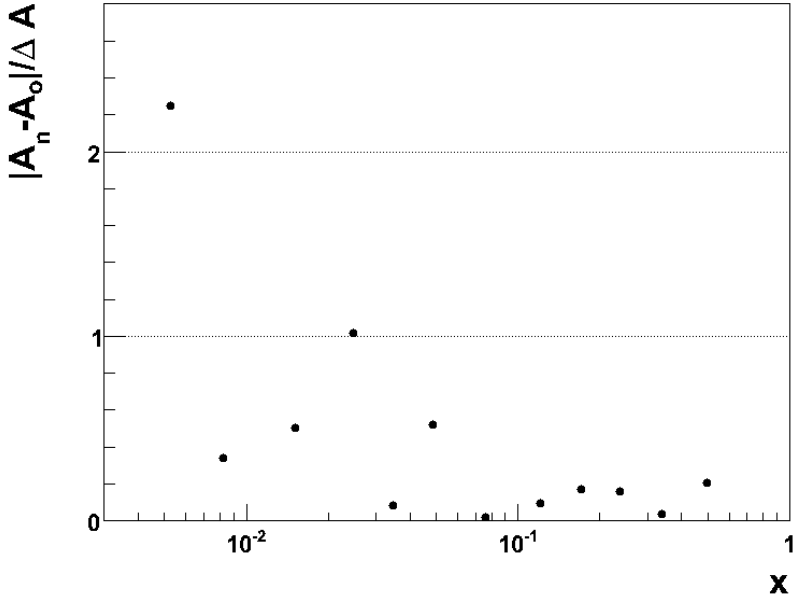
$$A_{\pi}^{T} = \frac{p_{K}}{p_{\pi} + p_{K} - 1} A_{\pi}^{M} - \frac{1 - p_{\pi}}{p_{\pi} + p_{K} - 1} A_{K}^{M}$$

Corrected asymmetries (kaons)

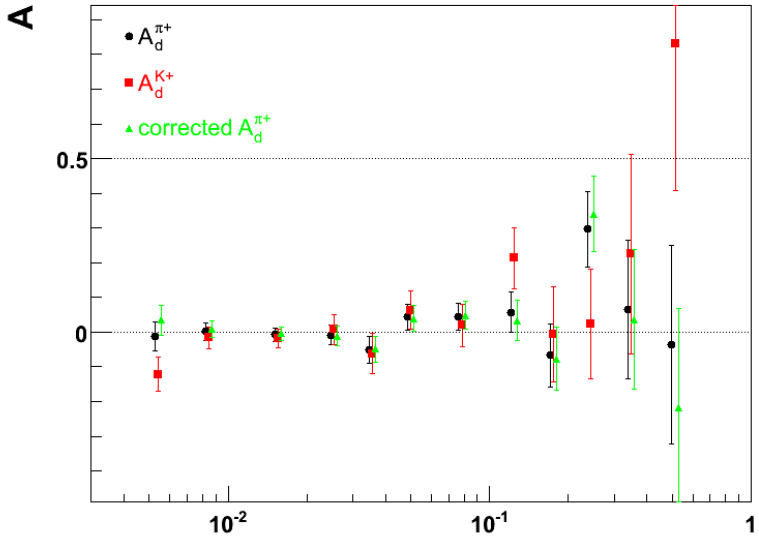


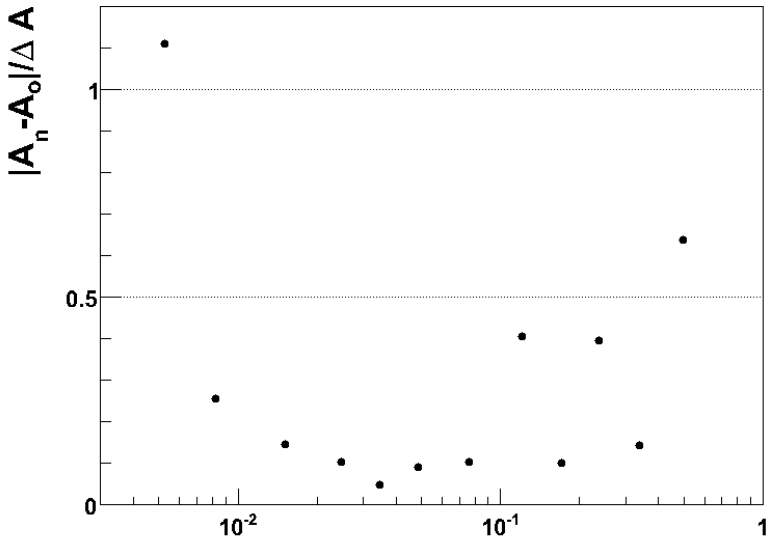


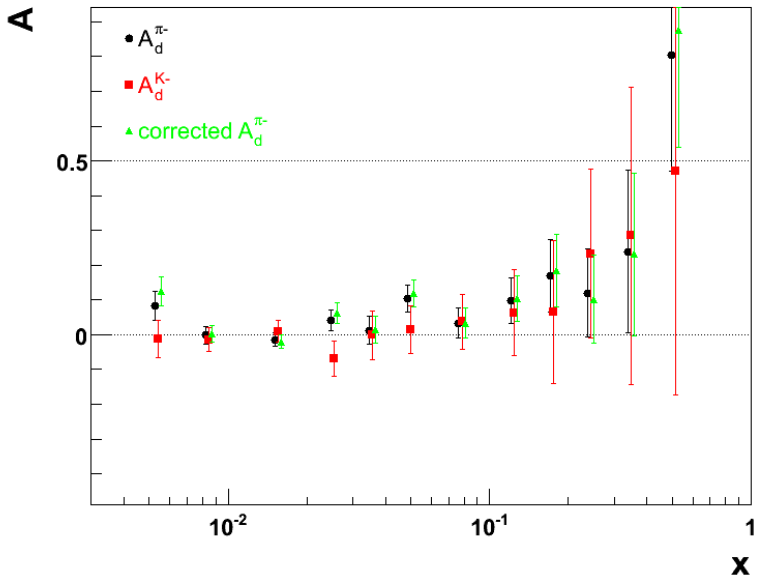


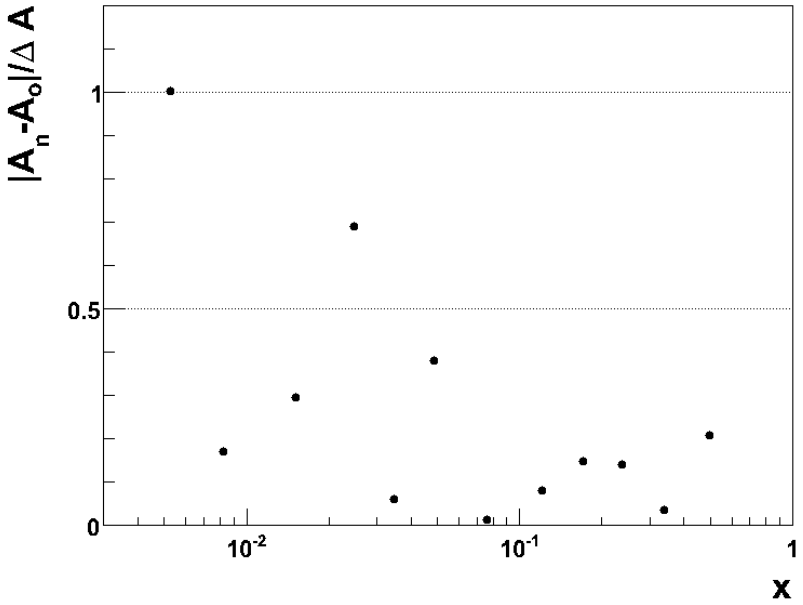


Corrected asymmetries (pions)









Conclusion

- Purity of pions and kaons has been evaluated
- Purity corrections for asymmetries were determined
- In bins where purity is small & difference between pions and kaons asymmetries is large, effect cannot be neglected