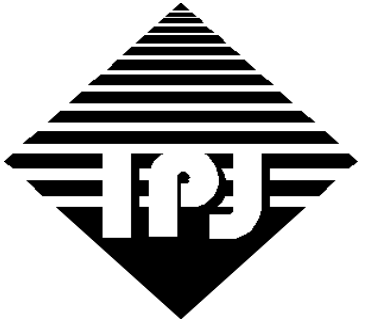


Asymmetries of identified particles (2002-2004)

Rafal Gazda

Outline:

* Optimization cuts on LH for charged kaons
  - "dirty" ϕ used
  - three ratios of LH checked
* Purity calculation
  - evaluated from exclusive ϕ samplef
* K^0 distribution
* Set of asymmetries

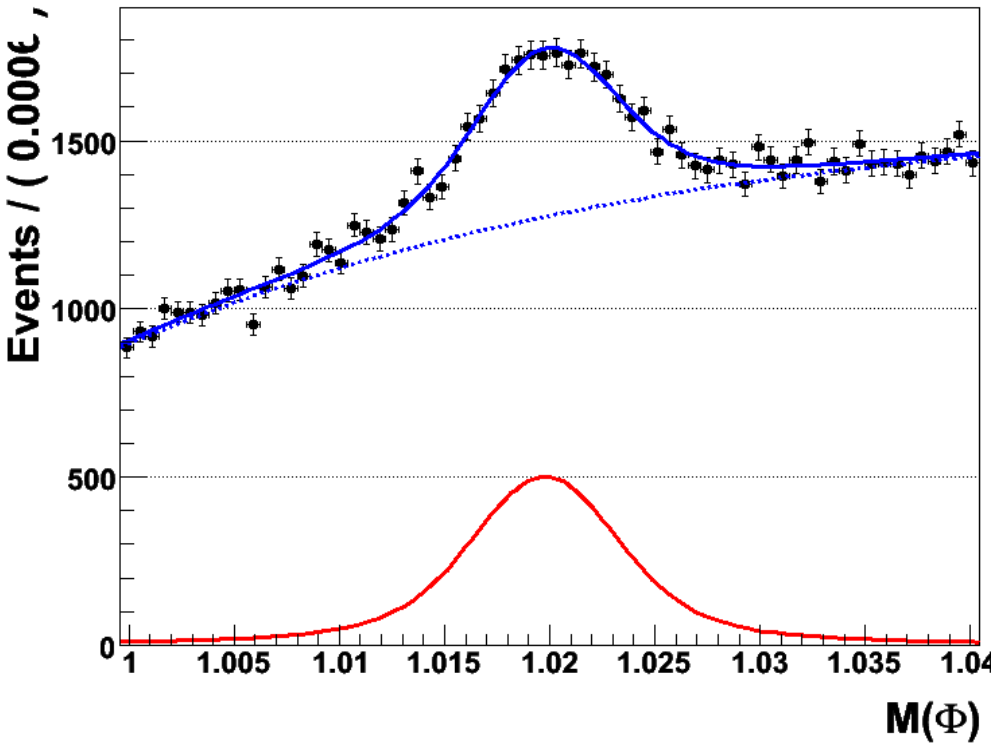
Data selection

Standard cuts on inclusive&semi-inclusive analysis:

* Best PV required
* beam and scattered muons
* scattered muons must hit in fired hodoscopes
* 140<Eb<180
* 0.1< y <0.9
* incoming muon crossed target cells
* PV in target
* $Q^2 > 1\,GeV^2$
* z>0.2

LH optimization

Cuts on LH tuned on inclusive ϕ .

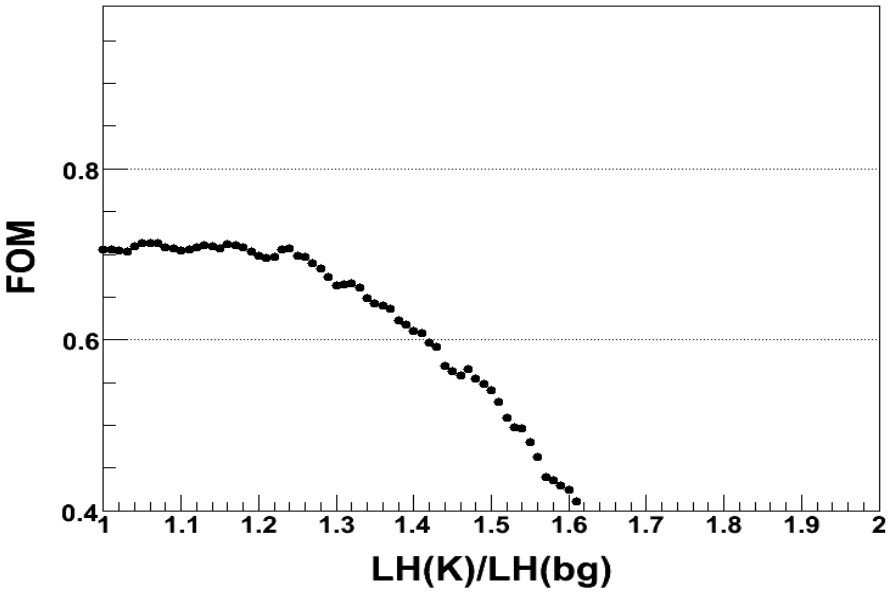


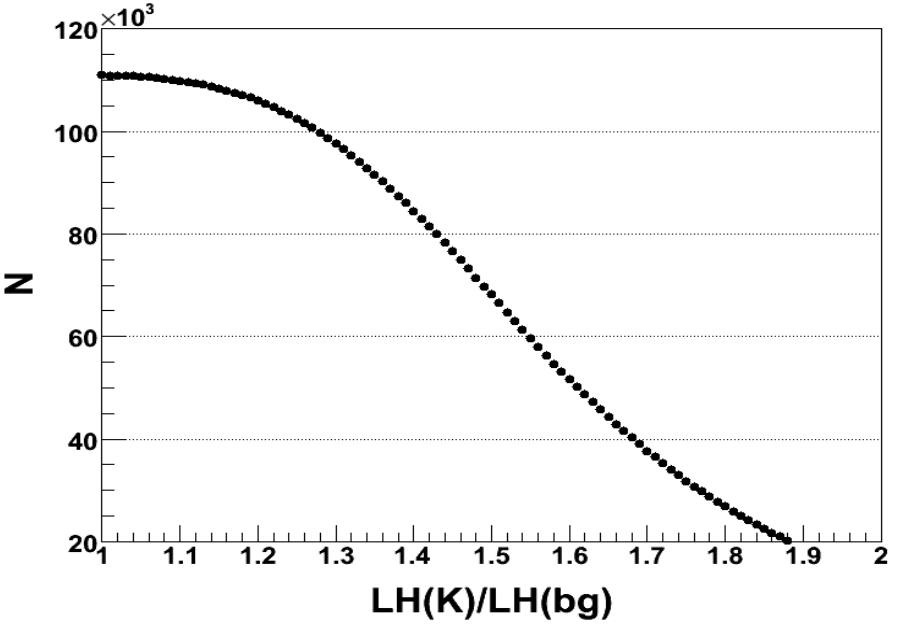
Convolution of Breit-Wigner and
Gauss + polynomial background

Selection of ϕ sample:

- At least 2 particles (+mu') from primary vetex
- opposite charges
- particles not marked as muon
- rich inf should be available
- Cut on missing energy not used

Cuts optimized w.r.t. FOM $= S^2/(S+B)$

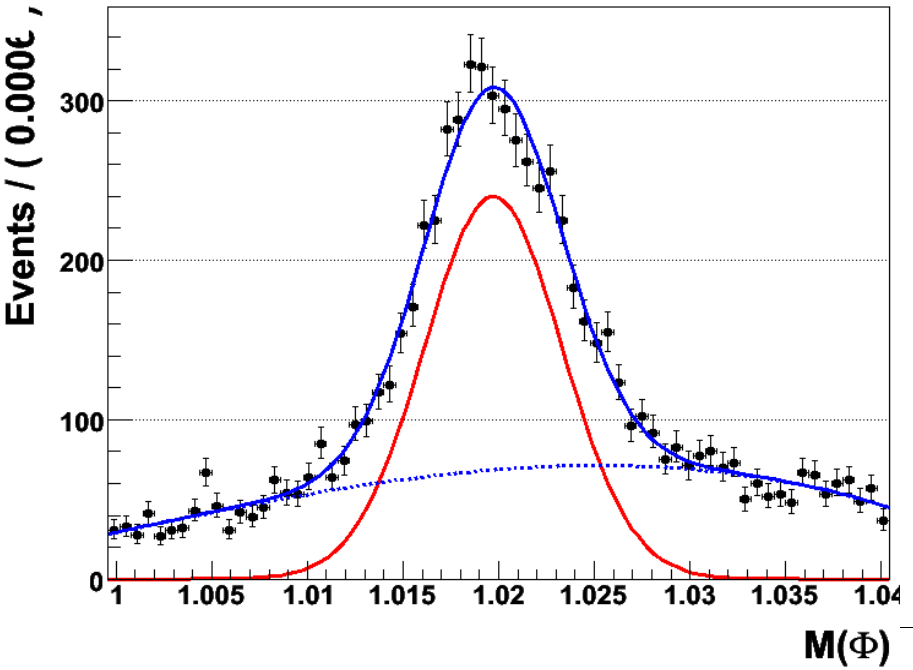




$$LH(K) > 1.24\, LH(bg)$$

$$LH(K) > 1.02\, LH(\pi)$$

$$LH(K) > LH(2\,max)$$

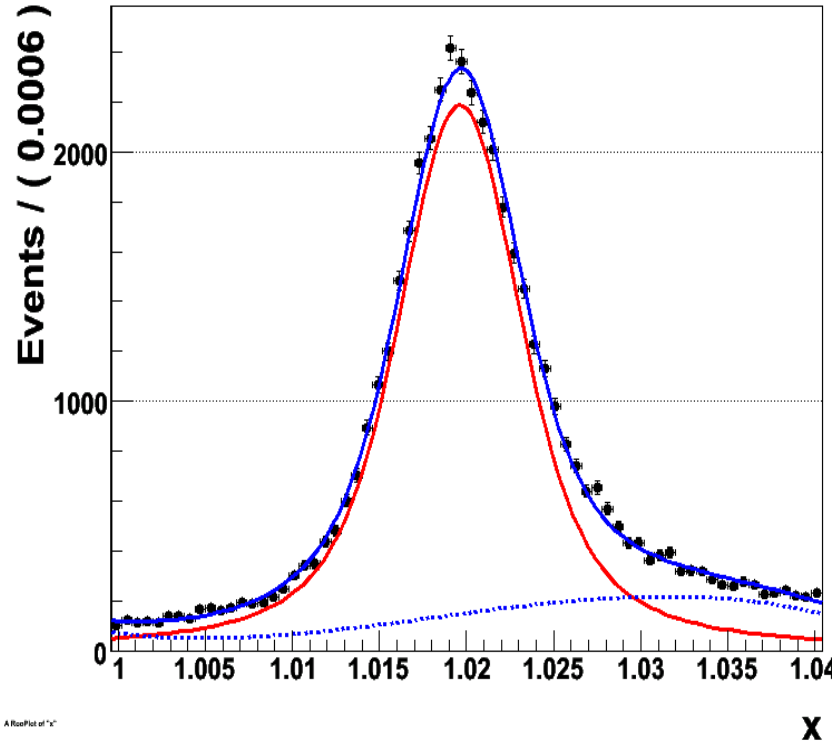


Purity evaluation

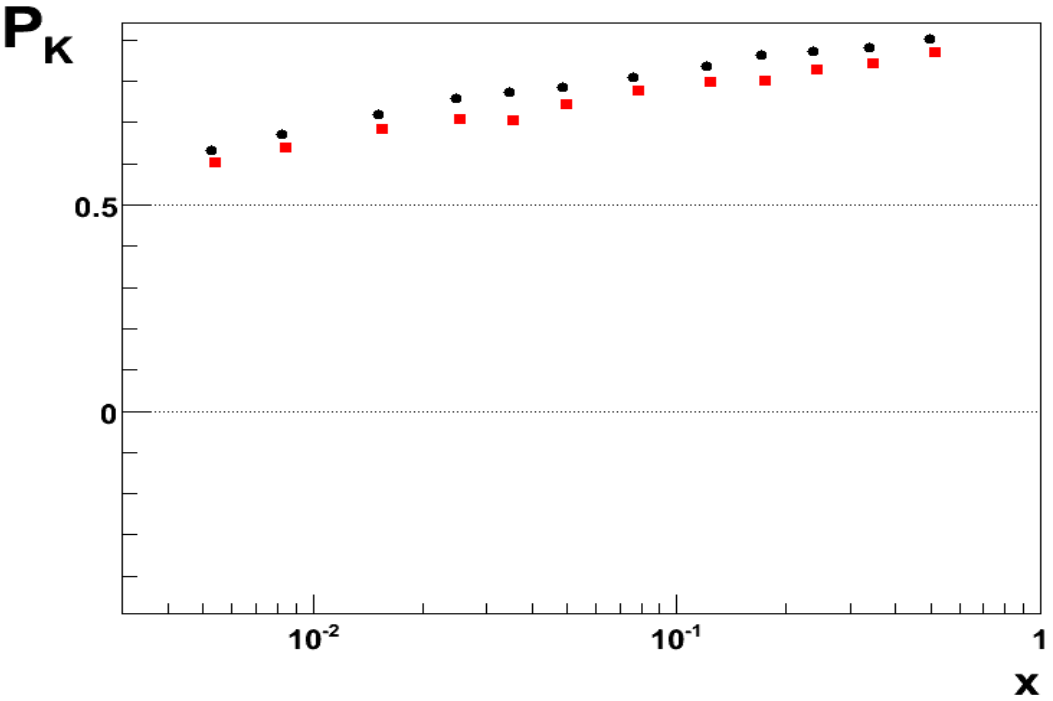
Calculated from exclusive ϕ sample:

- exactly 2 particles (+mu') from PV
- Cut on missing energy not used

S/B>20 – particles in window 1σ treated as true kaons.



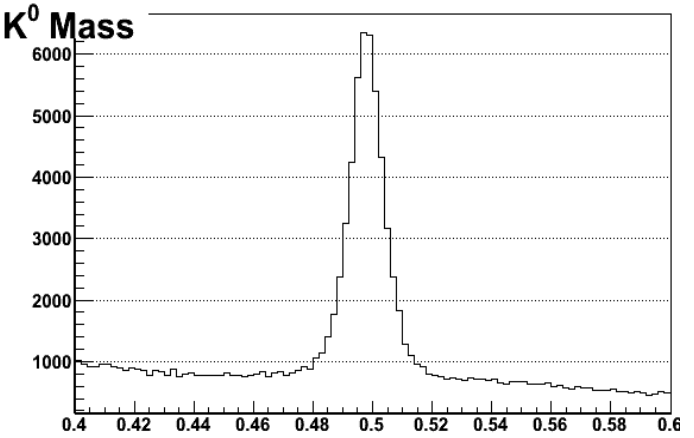
$$Purity = P(K>K)\, N_K^T / N_K^I$$

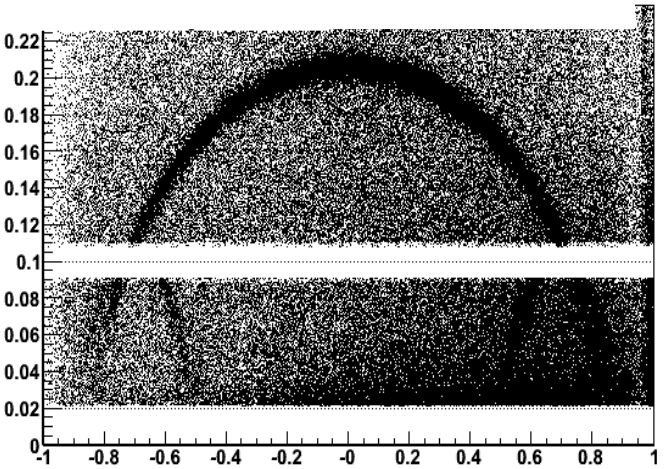


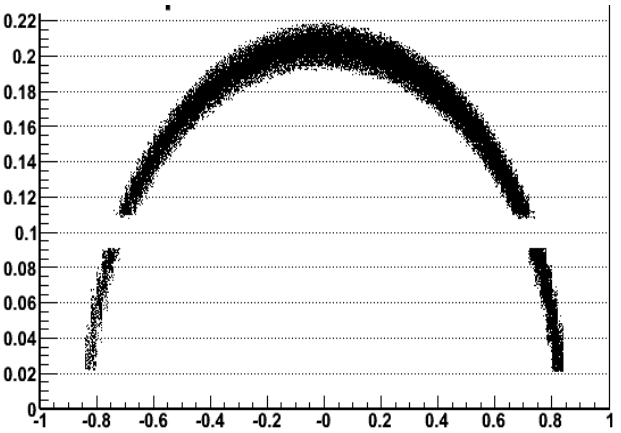
K^0 selection

Cuts (after std DIS):

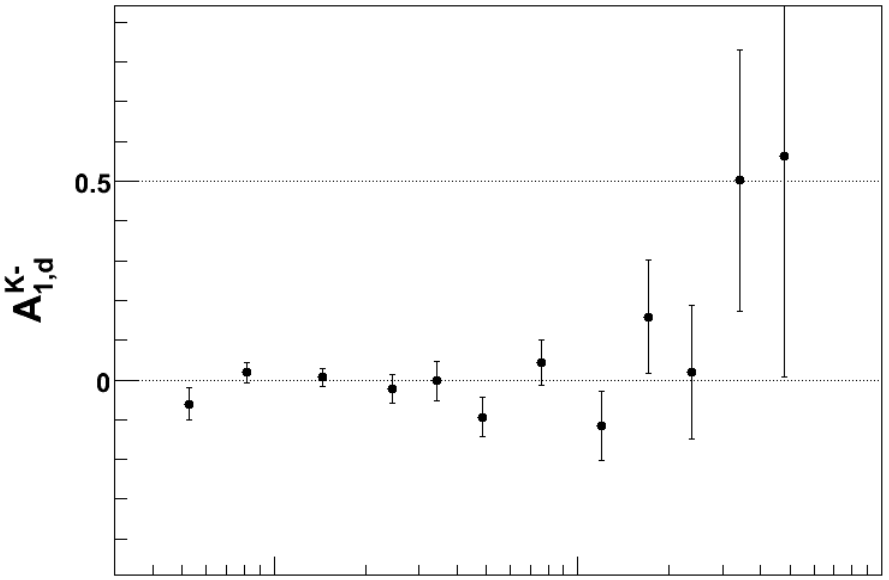
* all secondary vertices
* Z(SV) - Z(PV)>10cm
* SV with 2 tracks
* opposite charges
* particles not marked as muon
* pt>22MeV
* abs(pt-100MeV)<10MeV
* z>0.2
* M(fit)-M(PDG)<20MeV

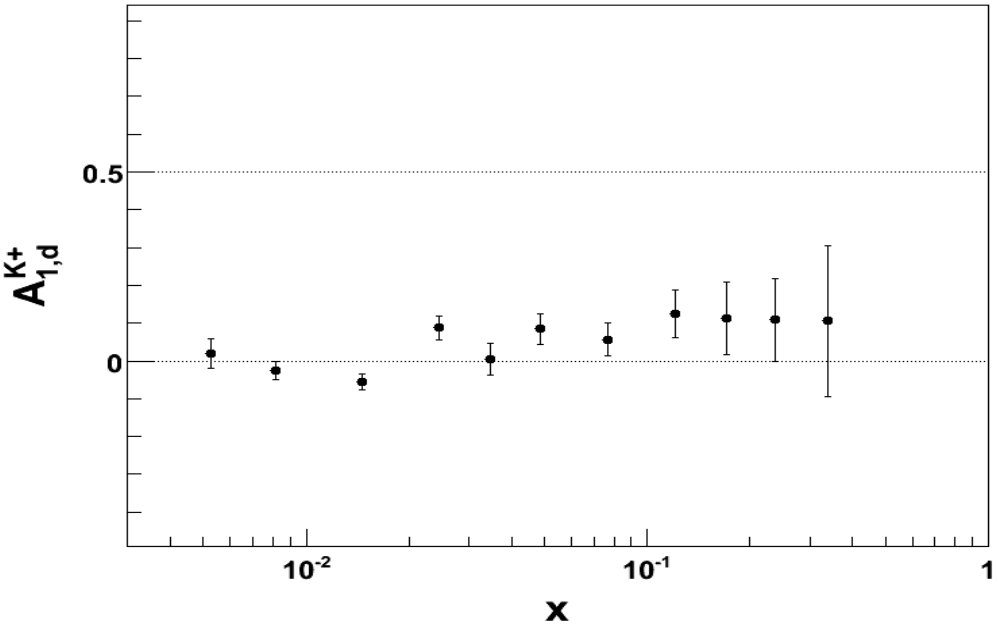


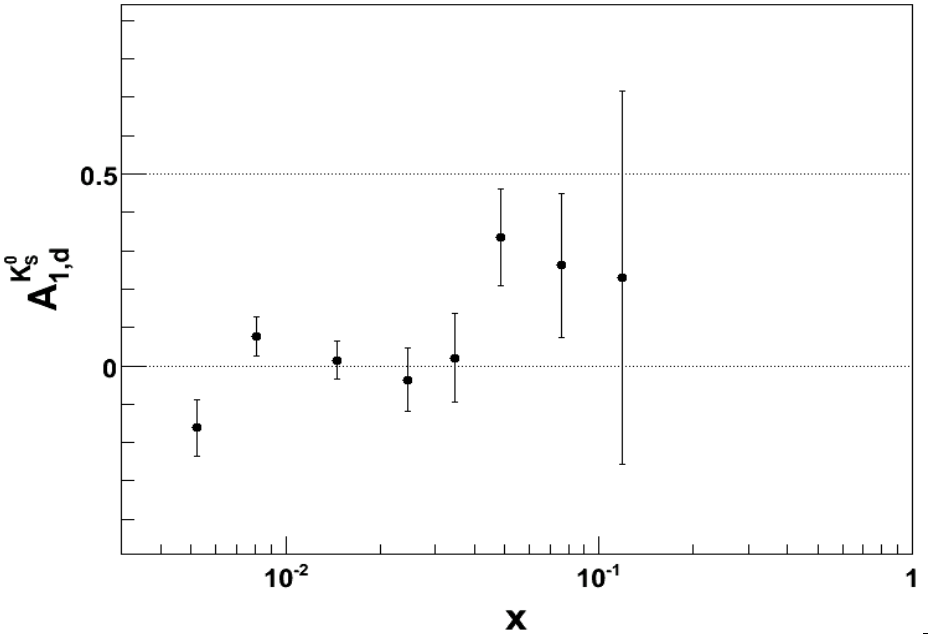




Asymmetries





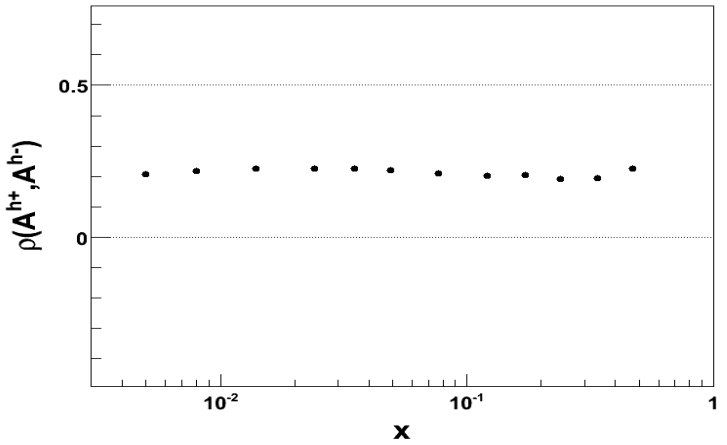


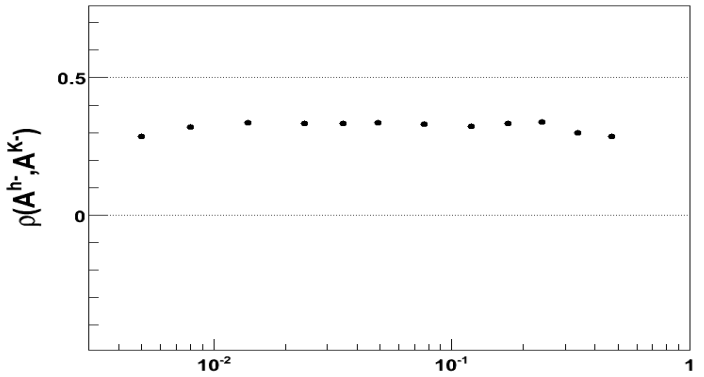
$N(K+) = 2.5 * 10^6$

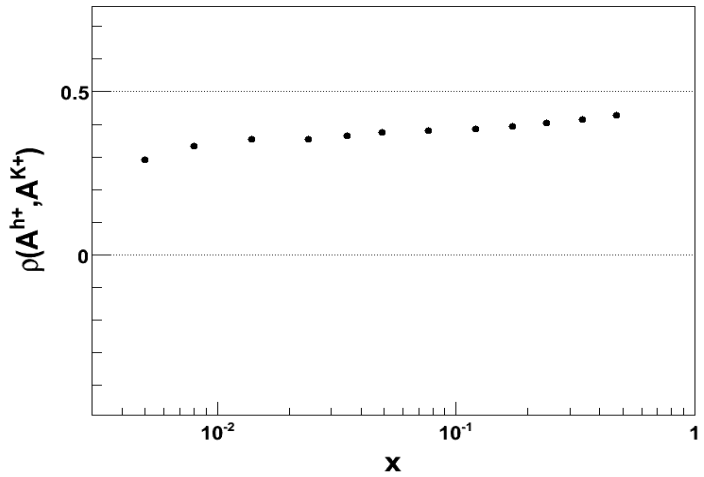
$N(K-) = 1.7 * 10^6$

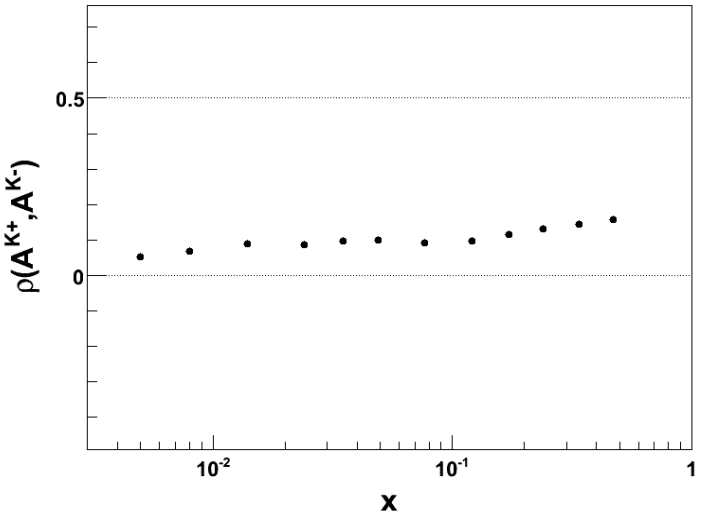
$N(K0) = 0.5 * 10^6$

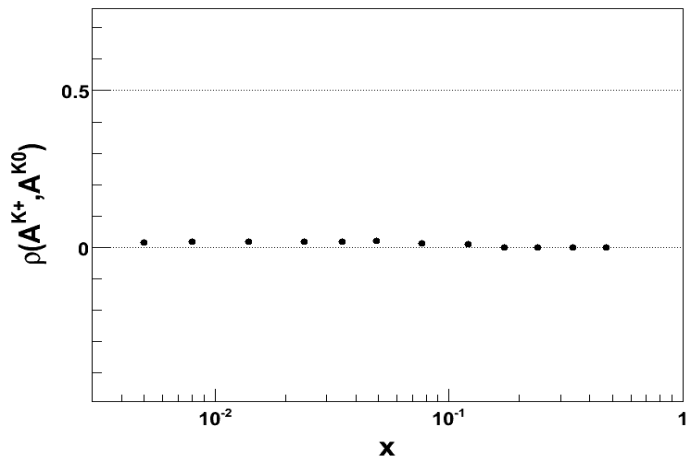
Correlations

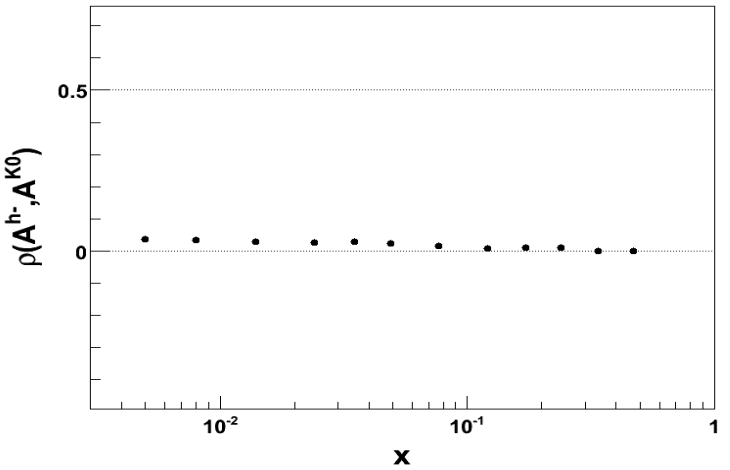












Outlook:

- use other RICH LH (electron, proton)
- check purity vs momentum and angle of hadron
- correct asymmetries for purity
- choose FF (see Alex talk) and calculate Δs