Invariant Mass studies in MIPP

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E907 Weekly analysis meeting

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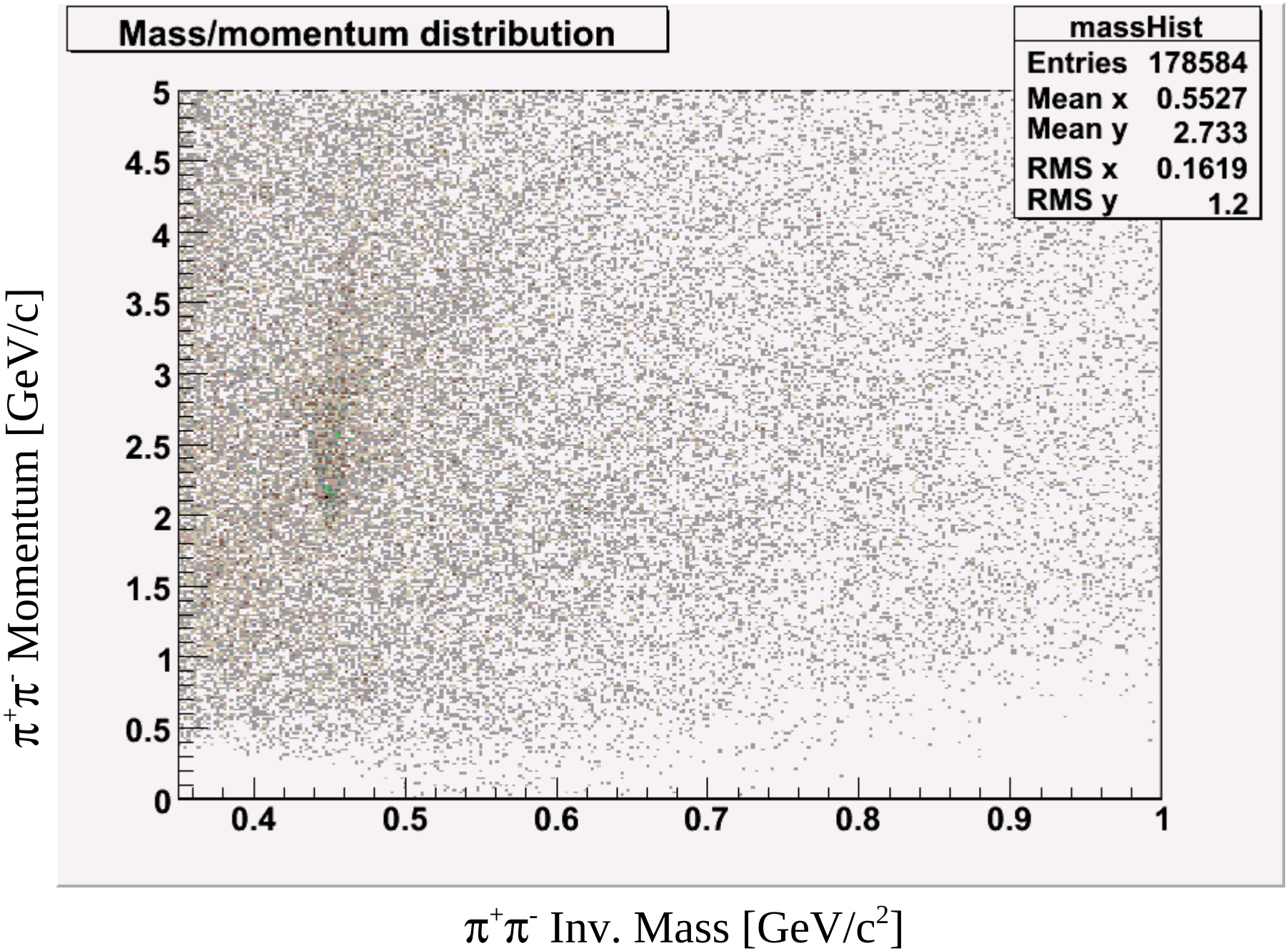
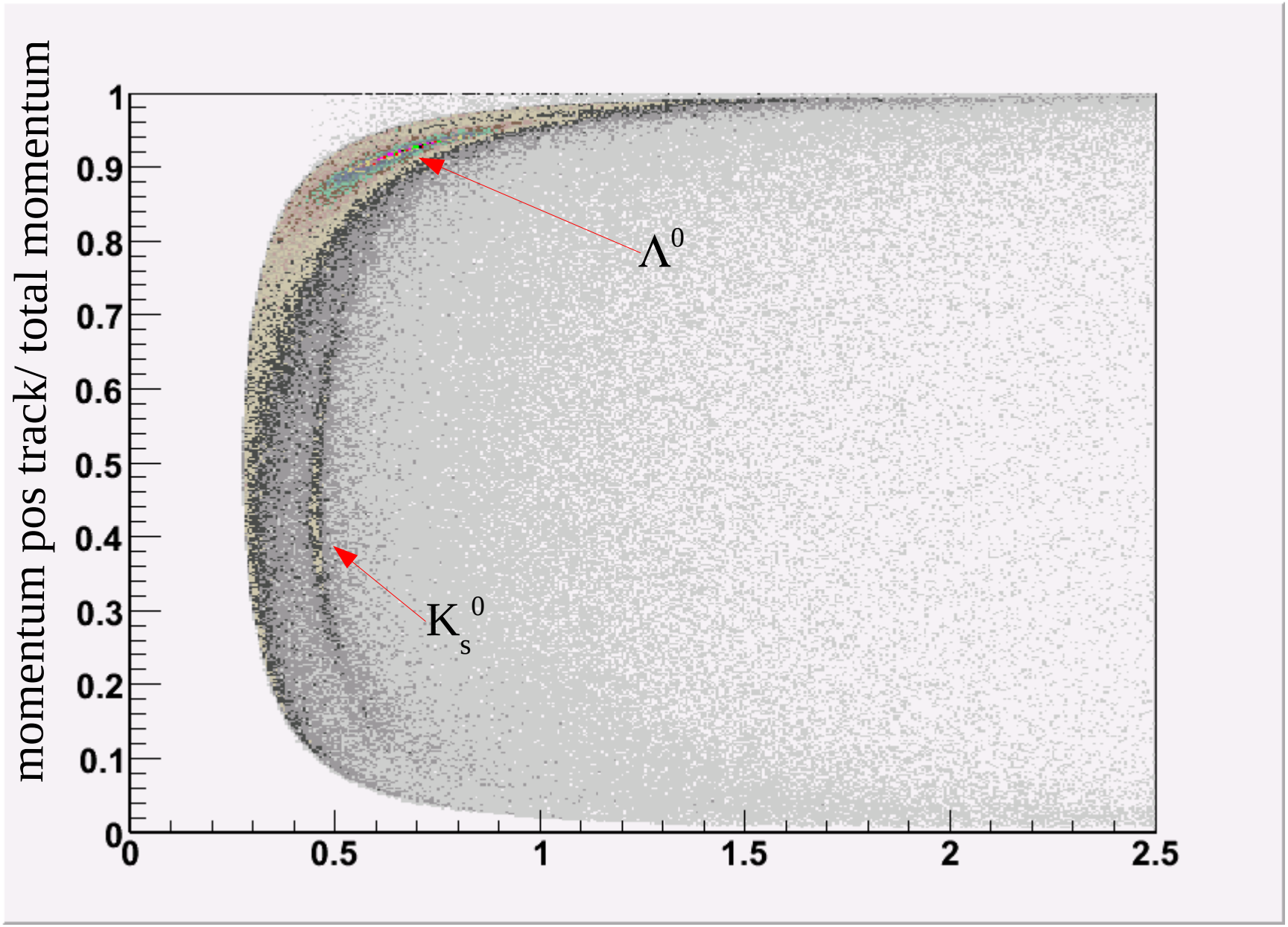
Why are we studying invariant mass?

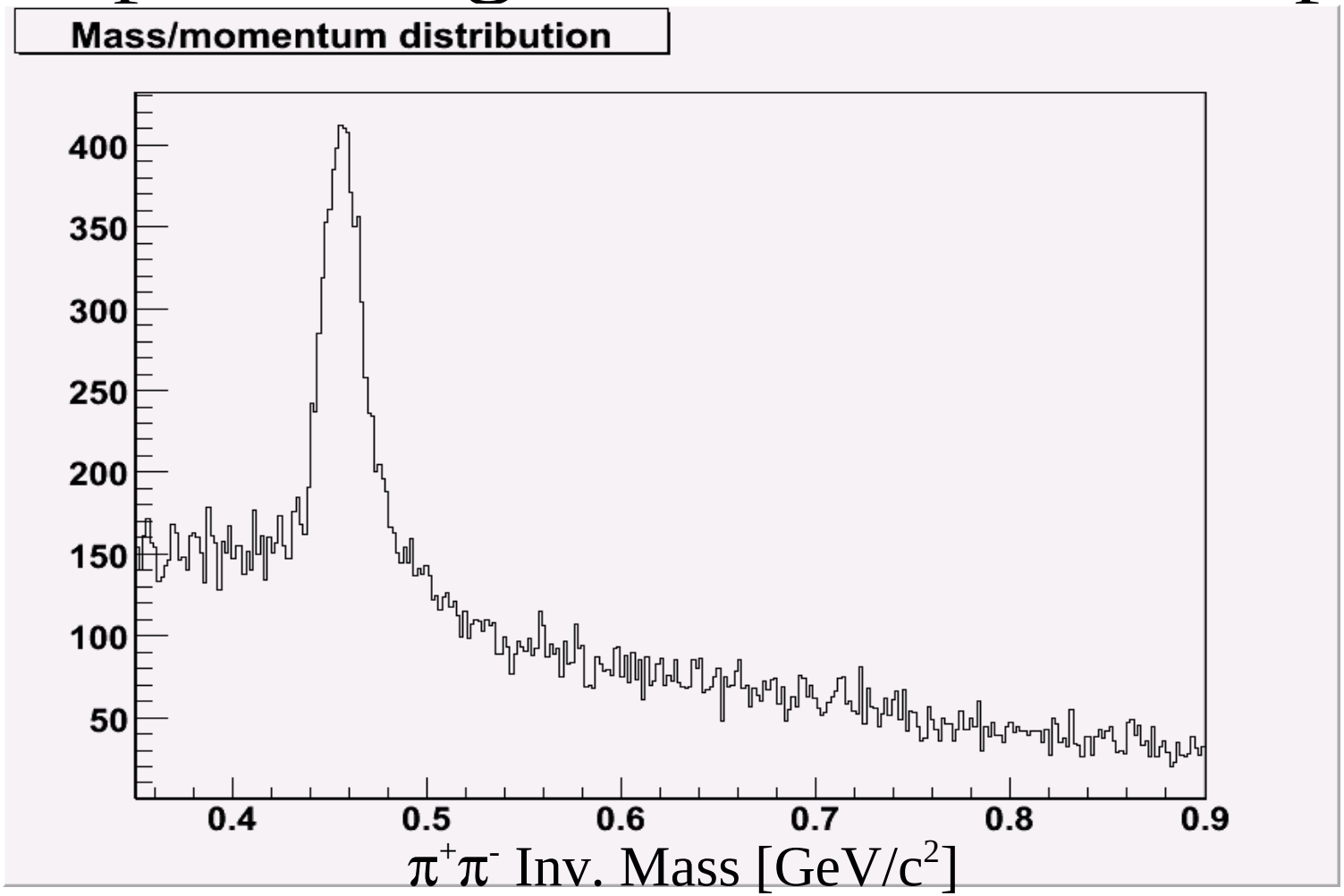
- Calibration:
  - A large well selected sample of charged pions from K_{short}^{0} decay are needed to calibrate Particle Identification in various detectors.
    - for example Ckov
  - All experiments use the K_{short}^{0} and Λ^{0} invariant mass peaks to check and finalize:
    - Magnetic field
    - Tracking chamber locations
    - Analysis code performance
- Public Relations: to show our detector components, analysis code and data are working and that the PID is doing a good job.


Mass/momentum distribution
massHist
Entries 178584
Mean x 0.5527
Mean y 2.733
RMS x 0.1619
RMS y 1.2
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0.4
0.5
0.6
0.7
0.8
0.9
1
π+π- Momentum [GeV/c]
π+π- Inv. Mass [GeV/c2]

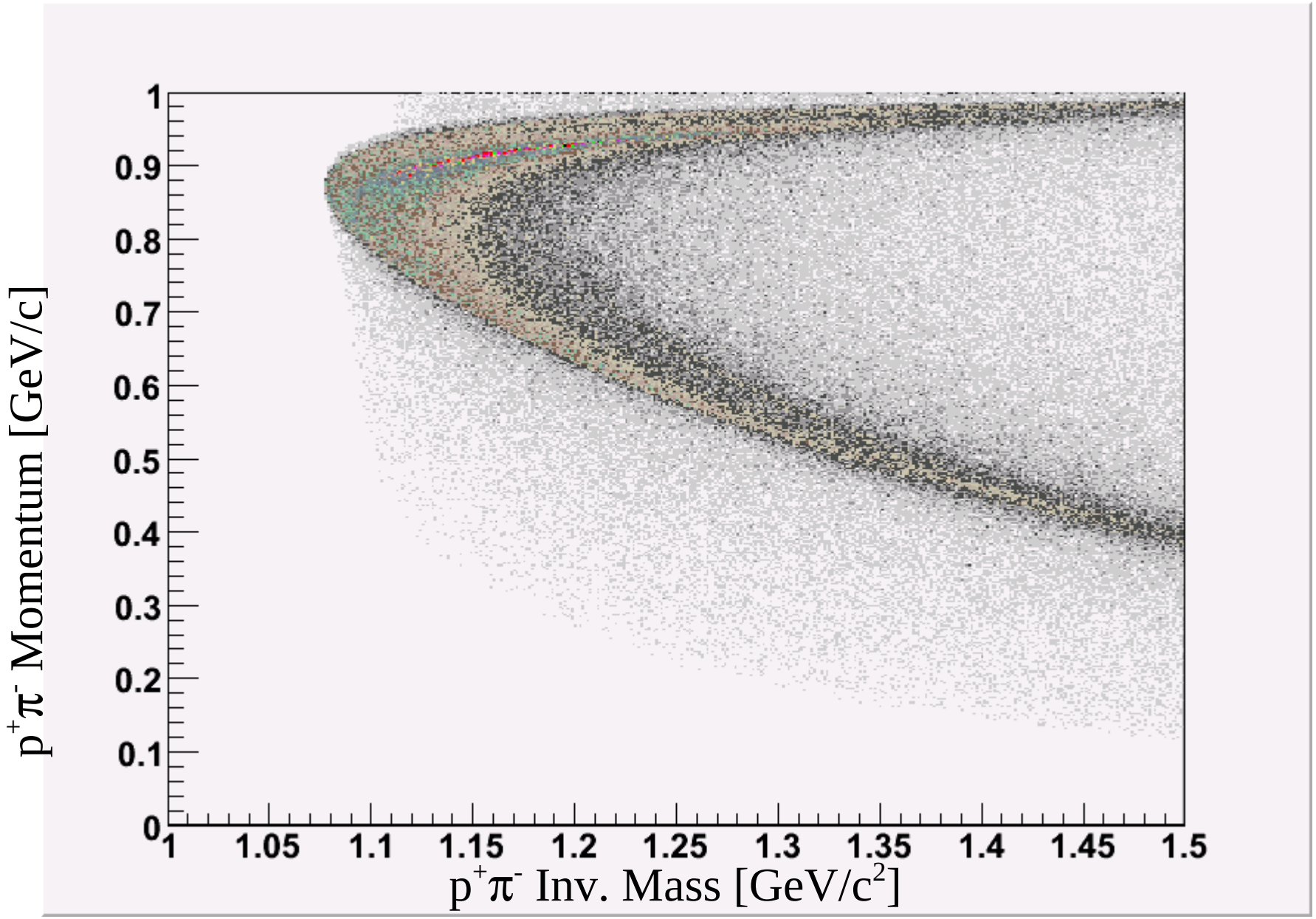


$\pi^+\pi^-$ Inv. Mass [GeV/c^2]

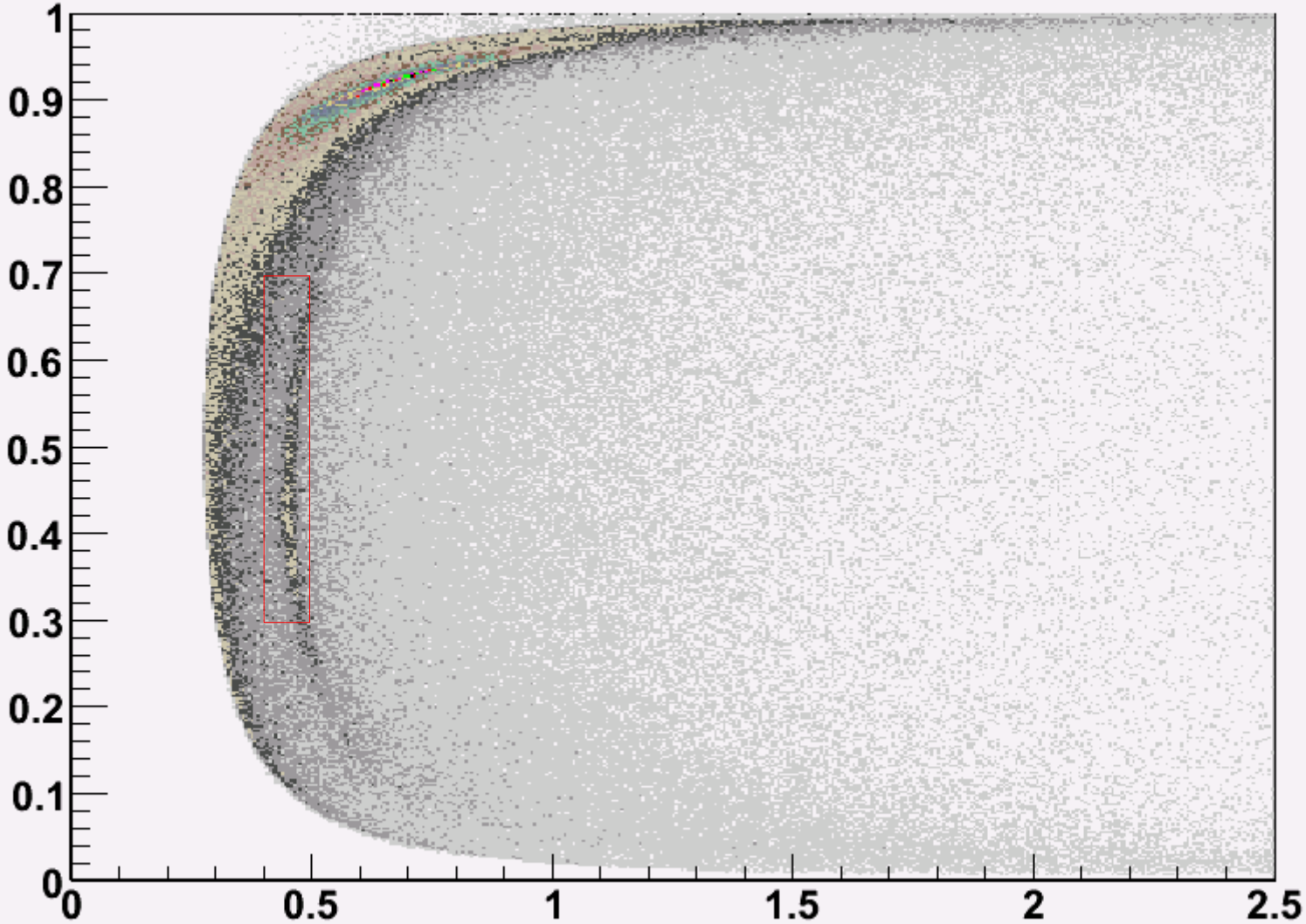
Simple cuts give a clean K^0 sample



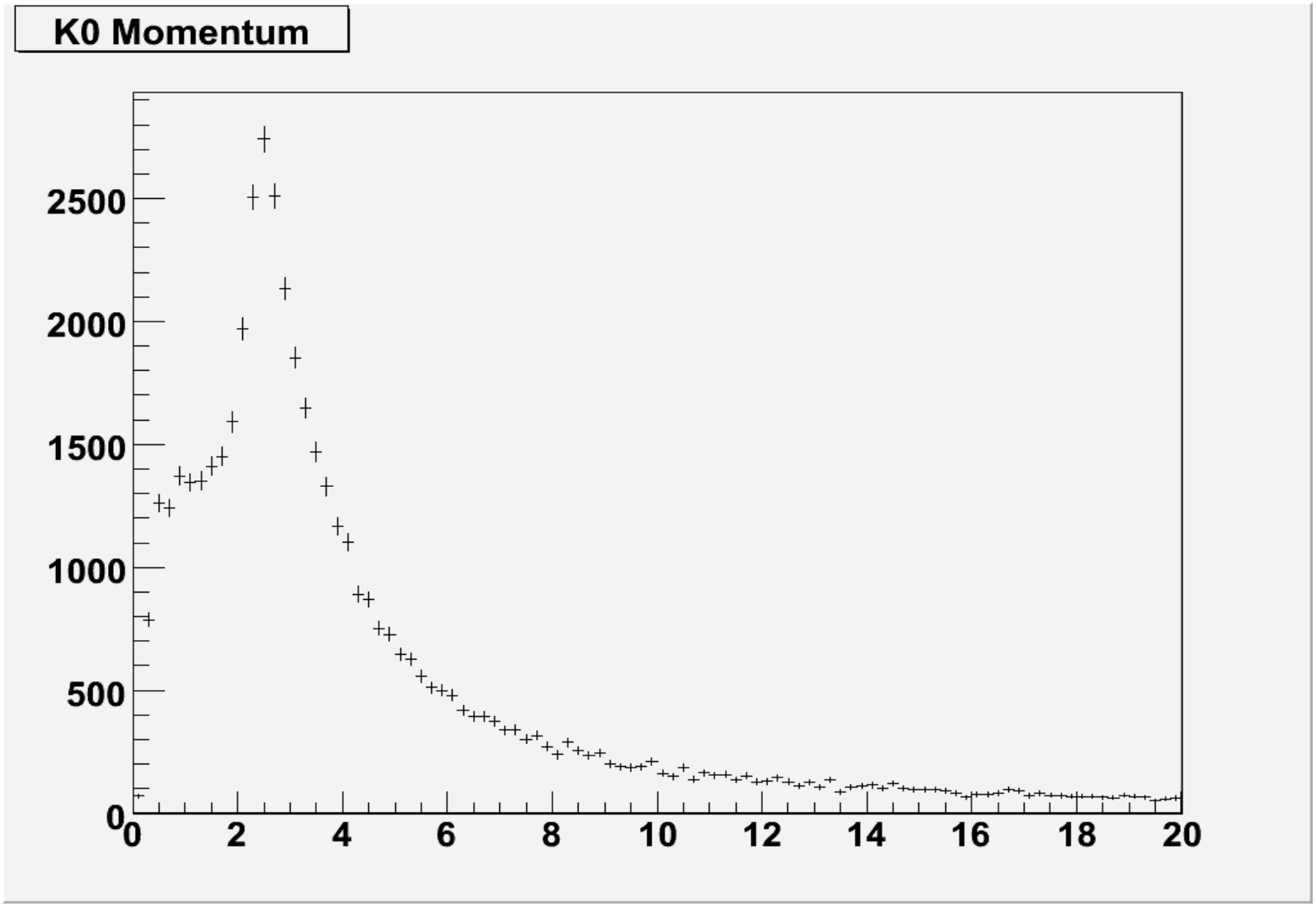
Even with the mass off David Lange said he can still use the current pass3 data to set Ckov cuts to select pions. He wants π^+ and π^- from target so asked that I next study target cuts to get those before he uses it.


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1
1.05
1.1
1.15
1.2
1.25
1.3
1.35
1.4
1.45
1.5
p+π- Momentum [GeV/c]
p+π- Inv. Mass [GeV/c2]

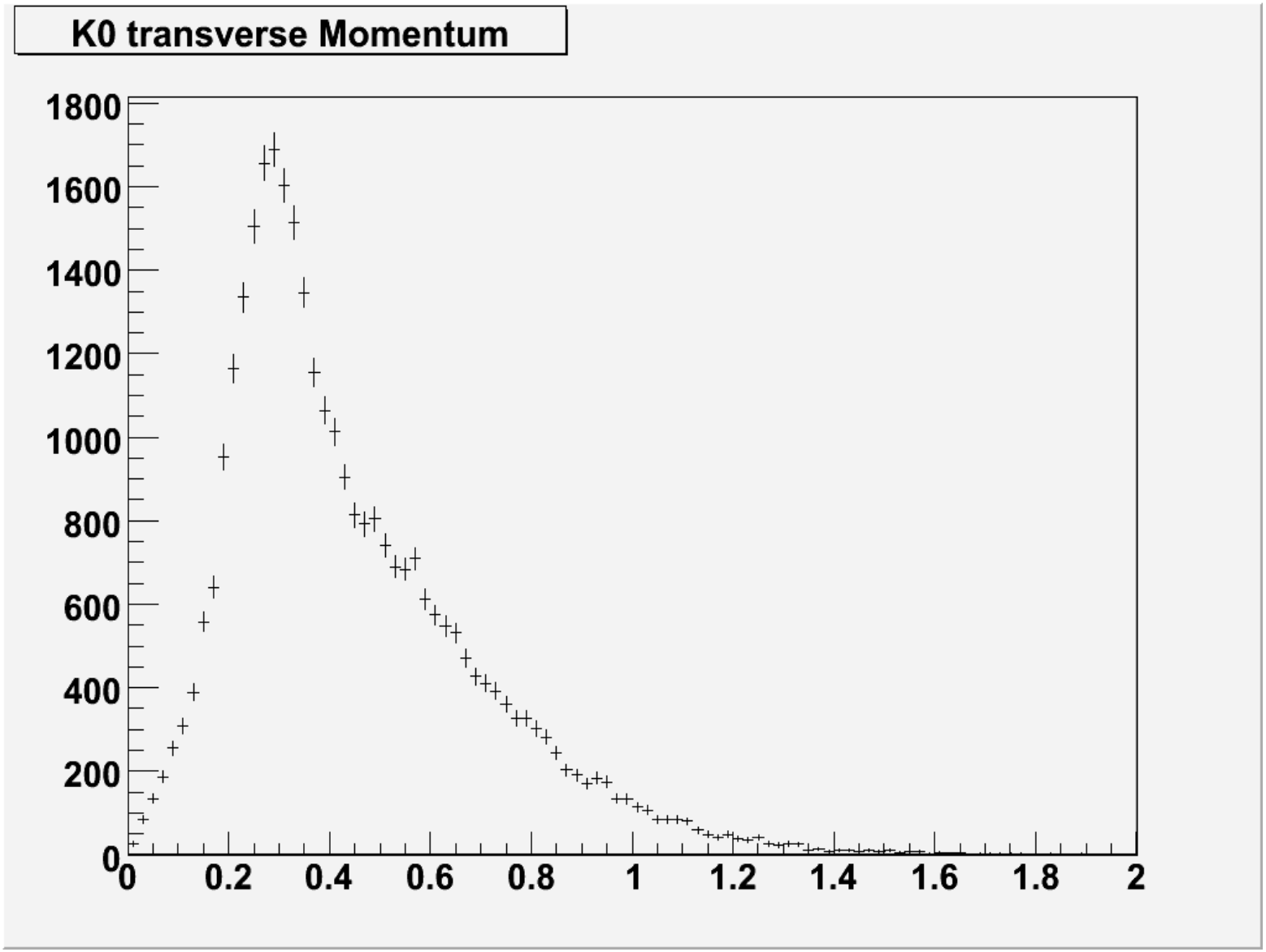
Selecting K^0 from Box



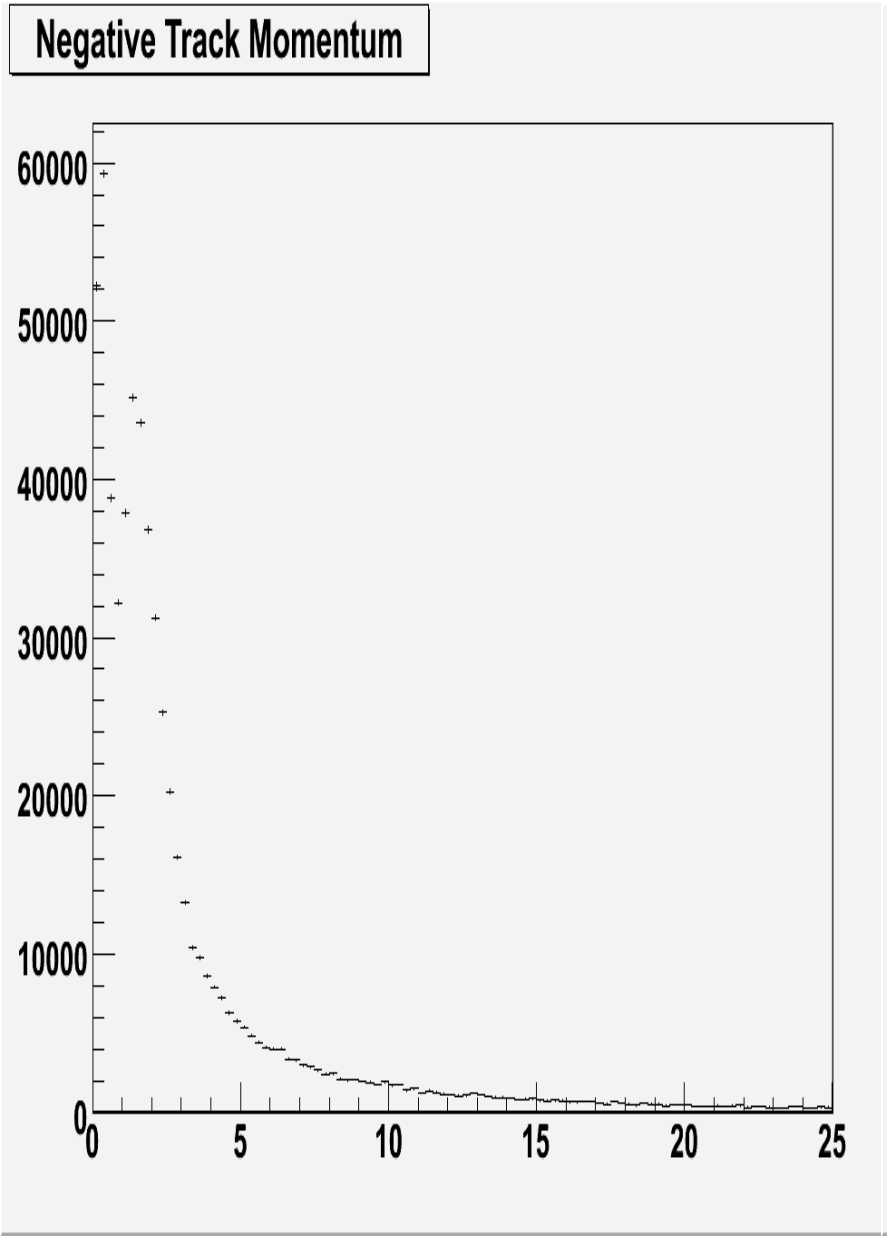
K^0 momentum, i.e. sum of pair.

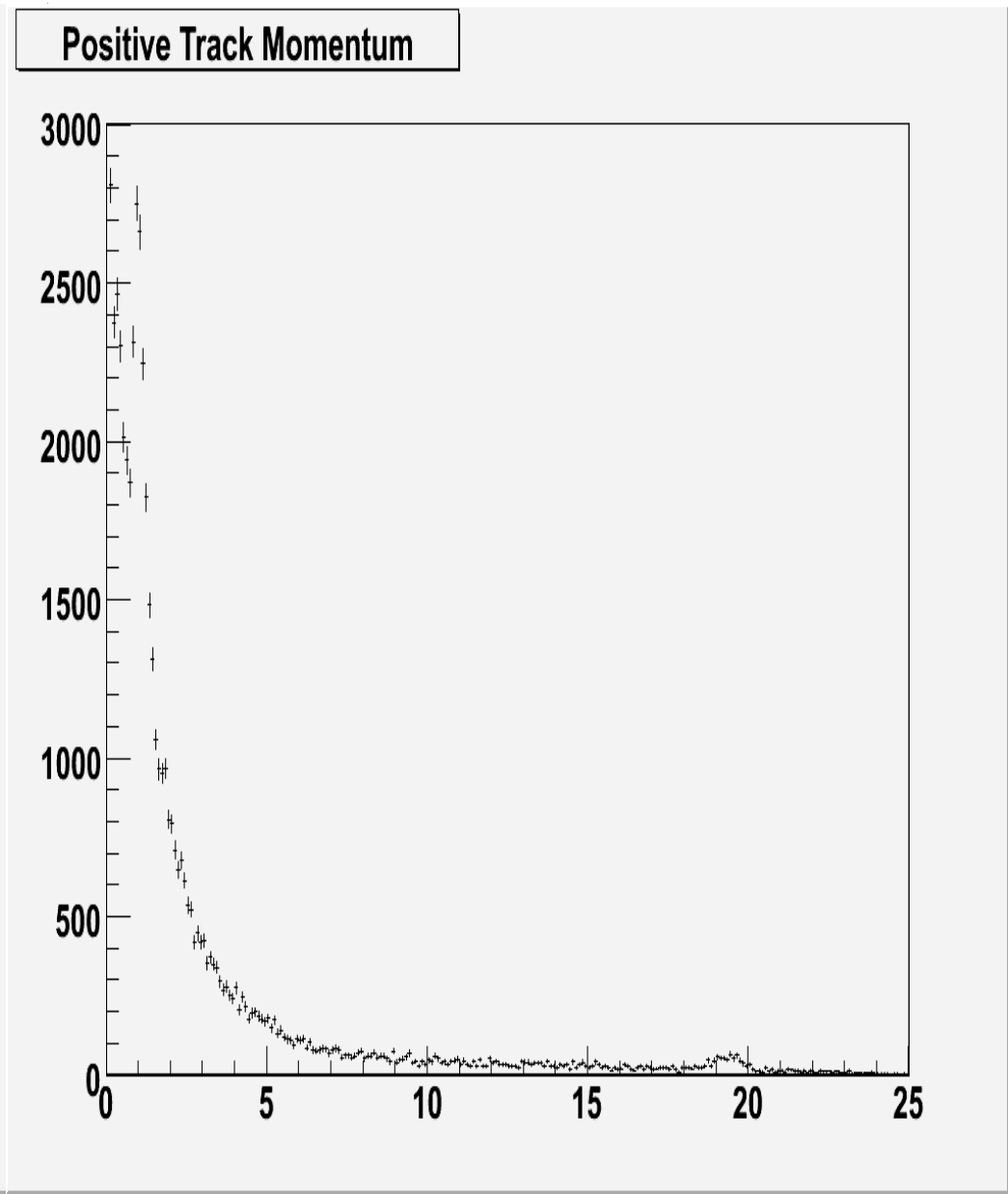
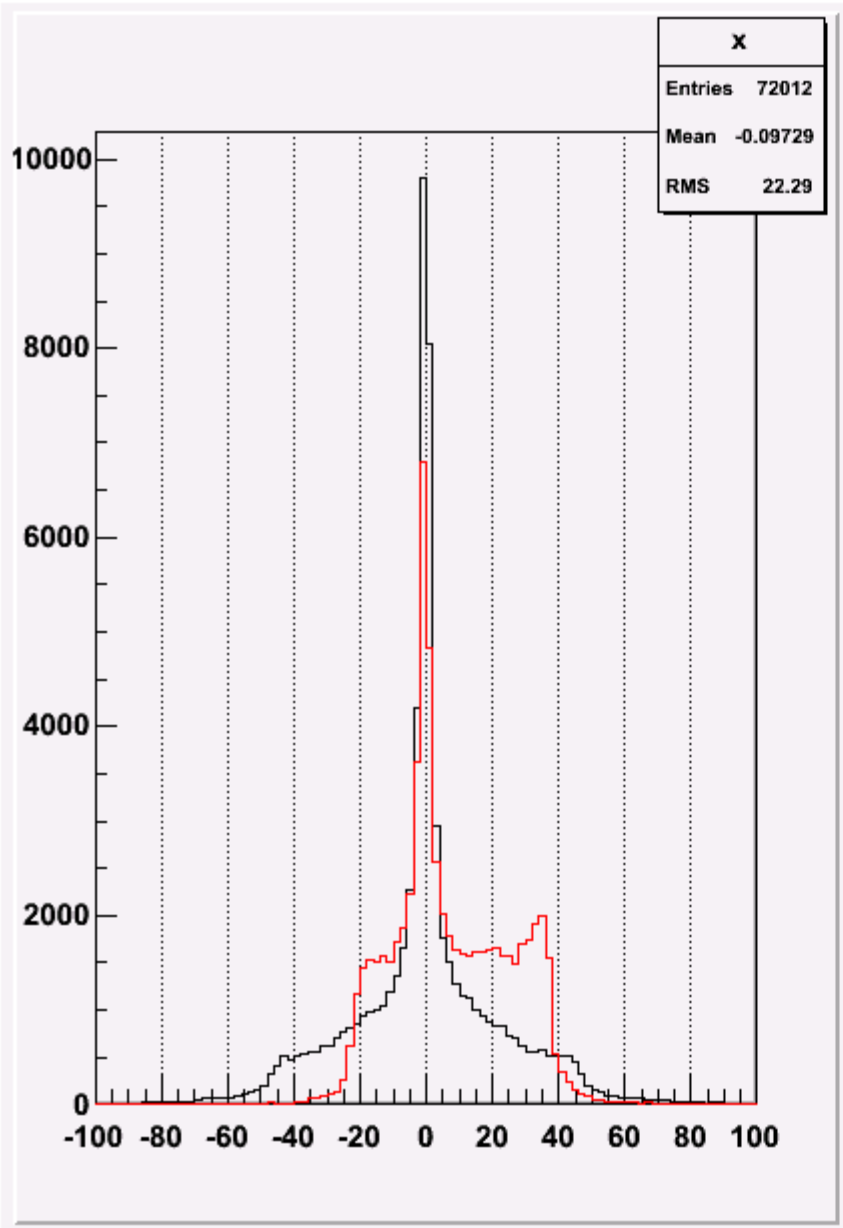
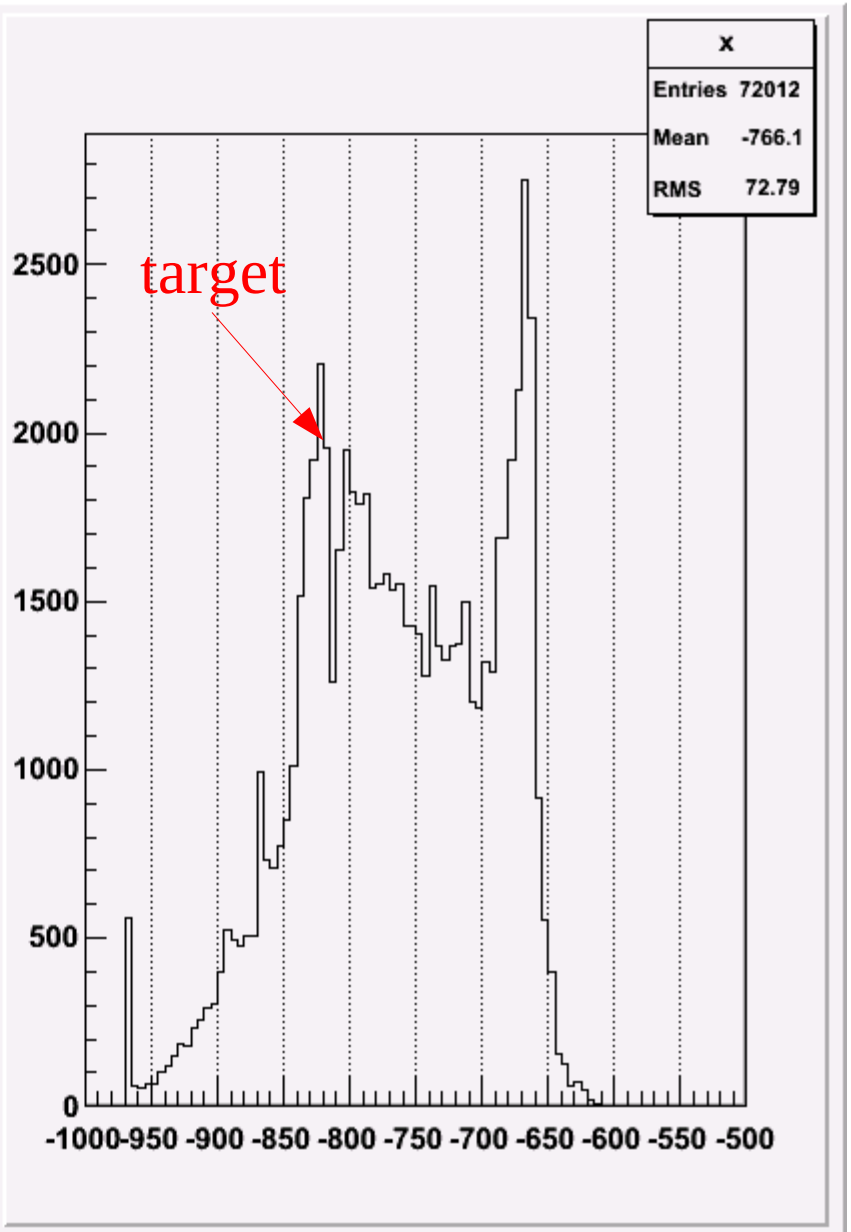


K^0 transverse momentum



Positive and Negative Track momentum





Vertexes of the tracks, needs more work