General information – 2-track sample:
Number of triggers = 6,324,470
Number of those events with exactly one valid proton in each direction = 4,289,310
Number of those events with exactly 2 tracks = 2,702,788
Number of events with exactly 2 tracks 1 vertex = 2,349,970
Number of events with exactly 2 tracks with Q=0 = 2,263,282
Number of events with exactly 2 tracks 1 vertex fiducial Q=0 = 1,957,270

Number that balance in px and py (between central system and forward portions: All:
dpy entries = 2,005,918
dpy integral = 1,585,600
dpx entries = 790,126
dpx integral = 756,300
integral stands for bin sum subtracting underflow and overflow data
fiducialRegion:
dpy entries = 1,418,423
dpy integral = 1,141,000
dpx entries = 611,072
dpx integral = 587,900

cuts used in this analysis:

CTpycut : Δpy < 0.06

CTpxcut : Δpx < 0.15

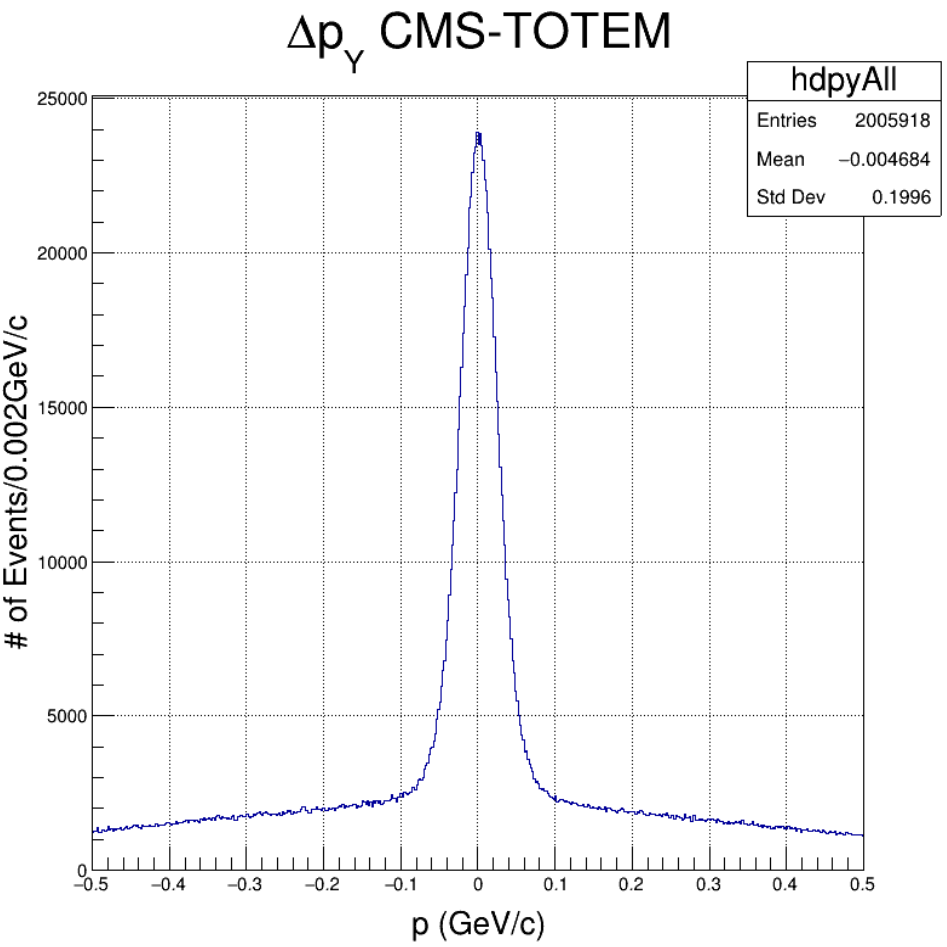
CTvertex : xvtxT = (xVtxR+xVtxL) / 2

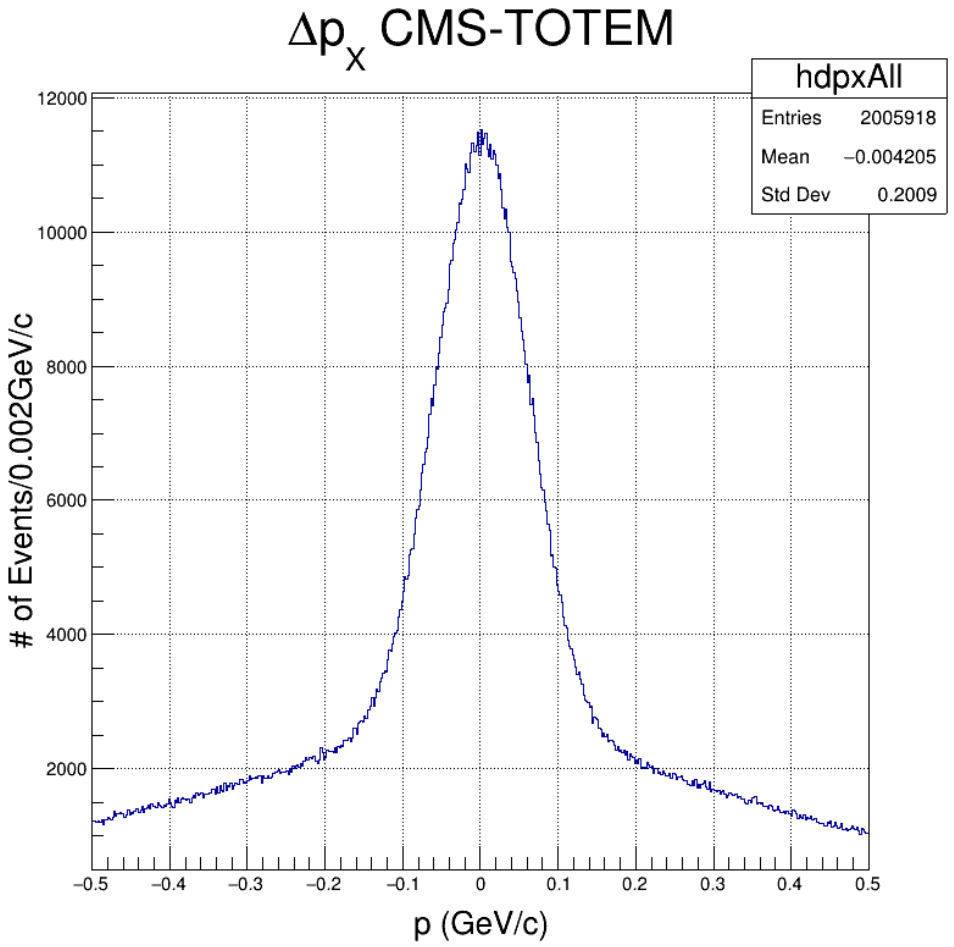
-0.04 < (xvtx – xvtxT*100) < 0.18

RPvertex : xVtxL – xVtxR < 0,00003

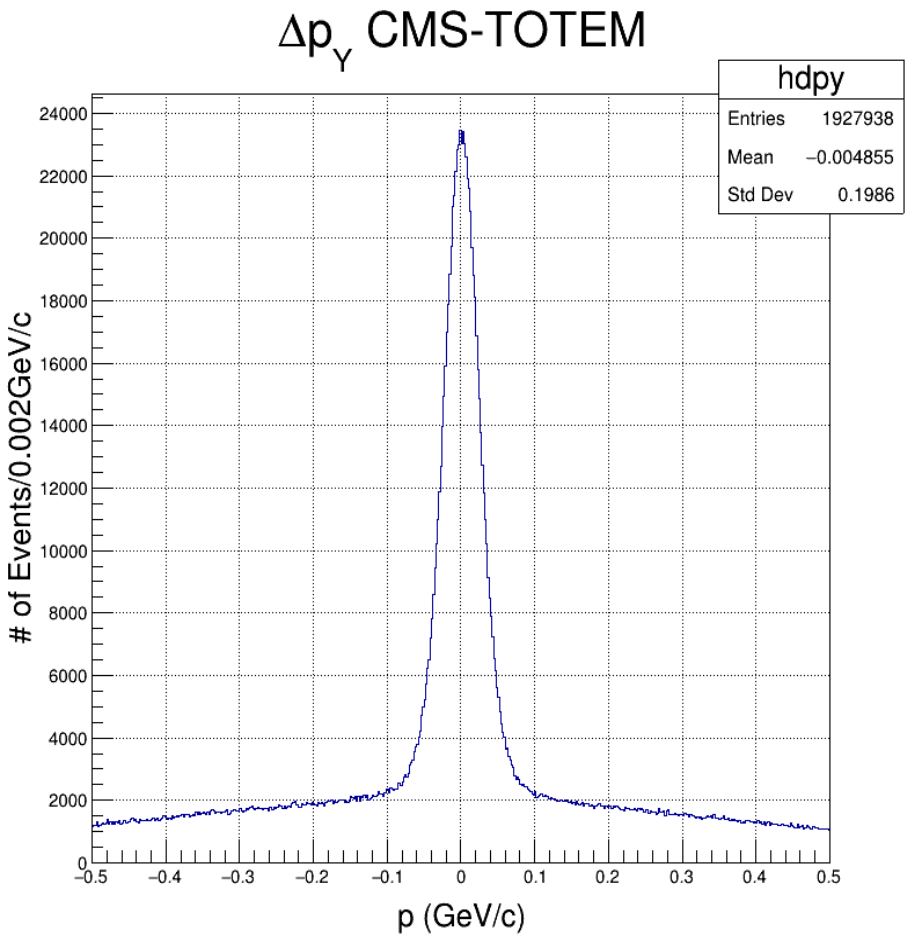
I am using these cuts in order to compare the outputs with Robert's results.

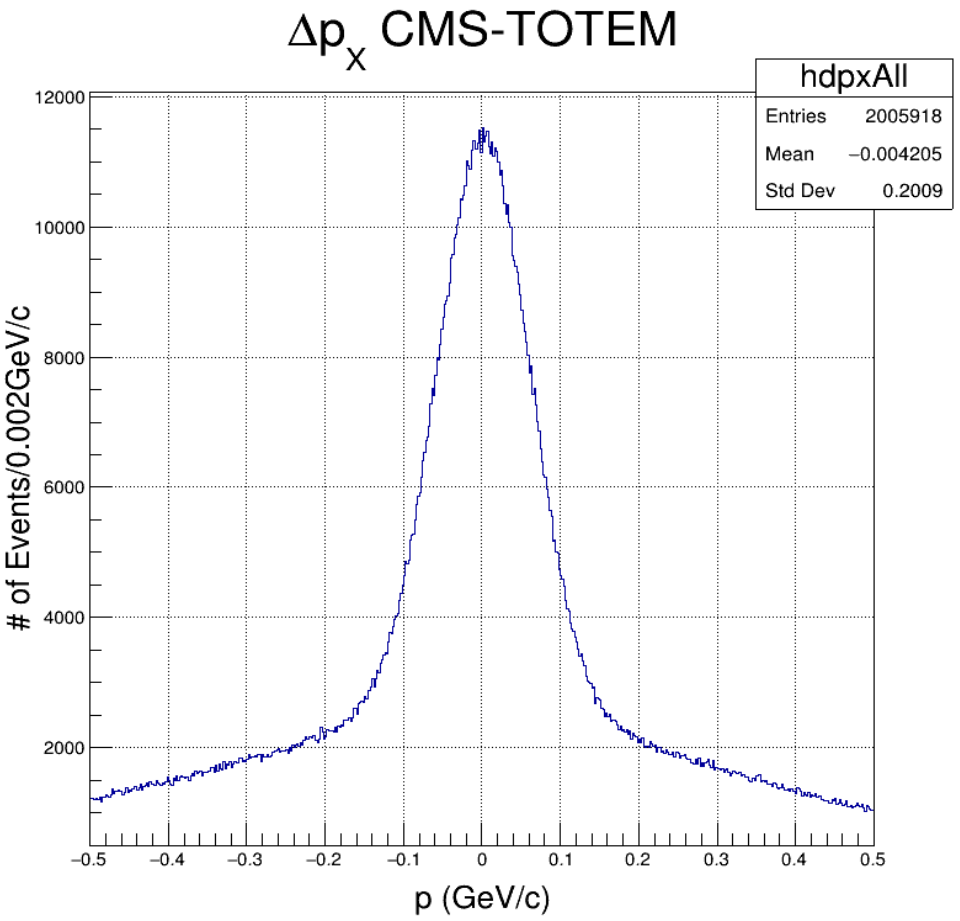
Balance: All

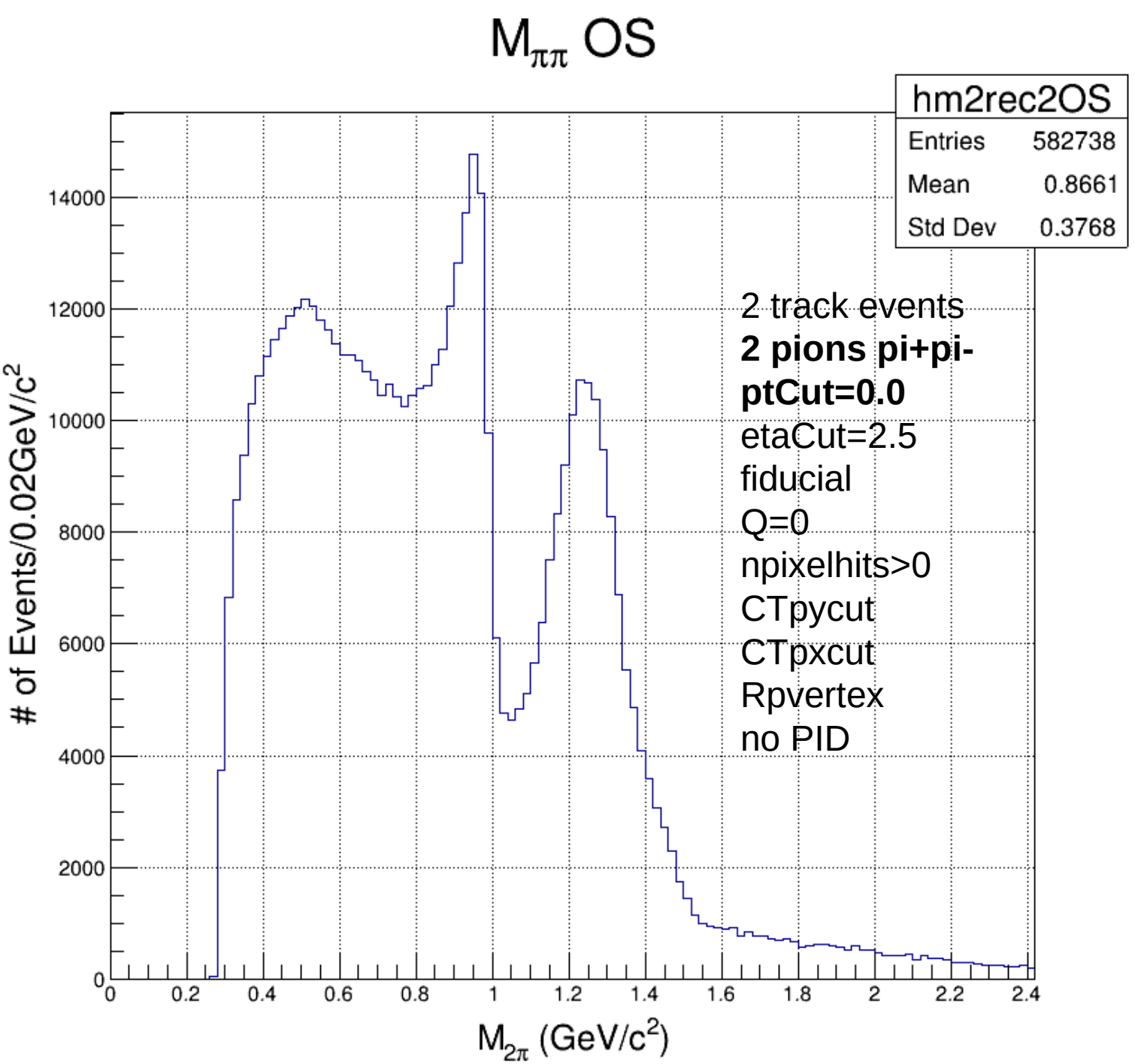

Δp_Y CMS-TOTEM
hdpyAll
Entries 2005918
Mean −0.004684
Std Dev 0.1996
# of Events/0.002GeV/c
p (GeV/c)


Δp_X CMS-TOTEM
hdpxAll
Entries 2005918
Mean −0.004205
Std Dev 0.2009
# of Events/0.002GeV/c
p (GeV/c)

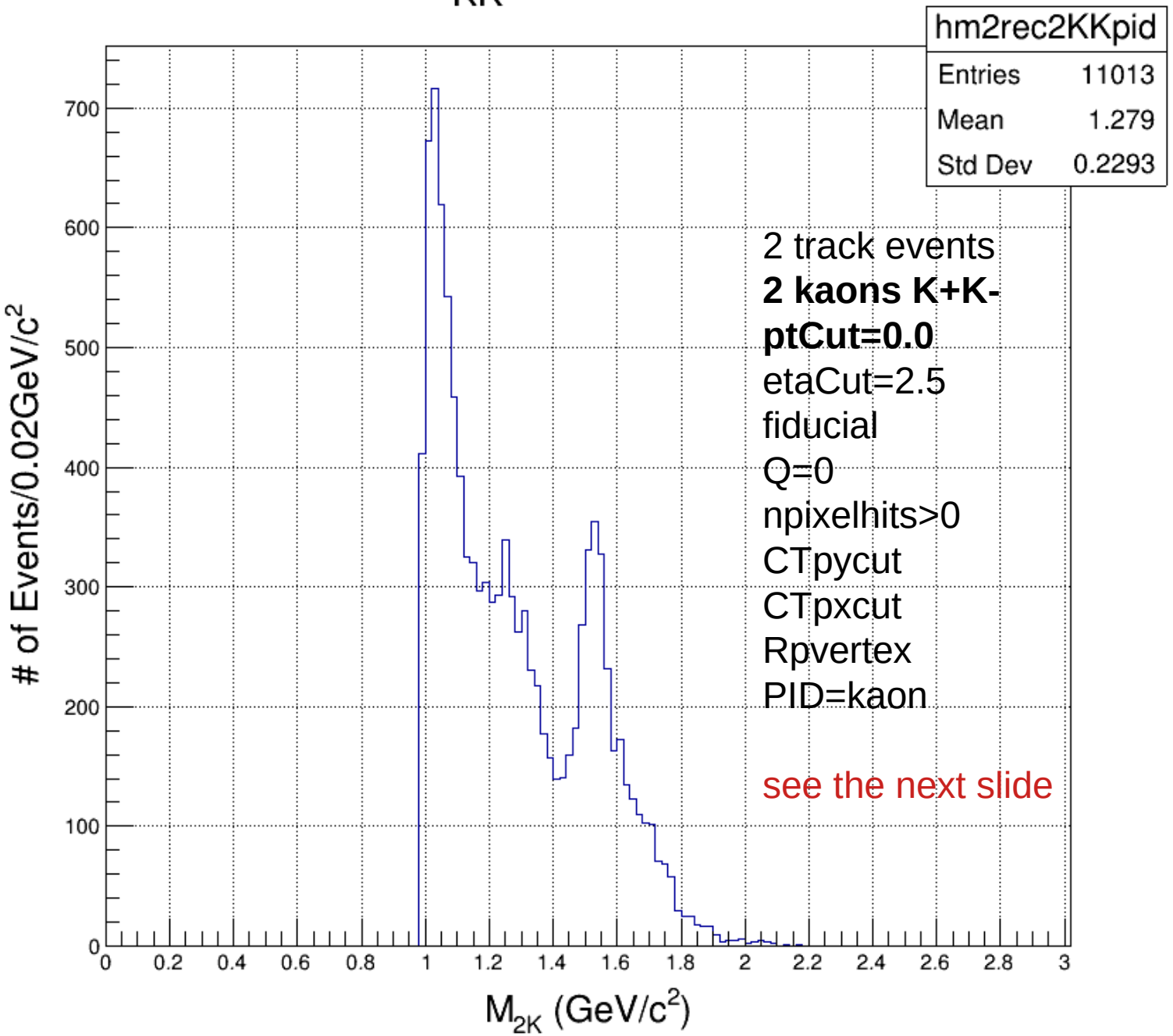
Balance: fiducial

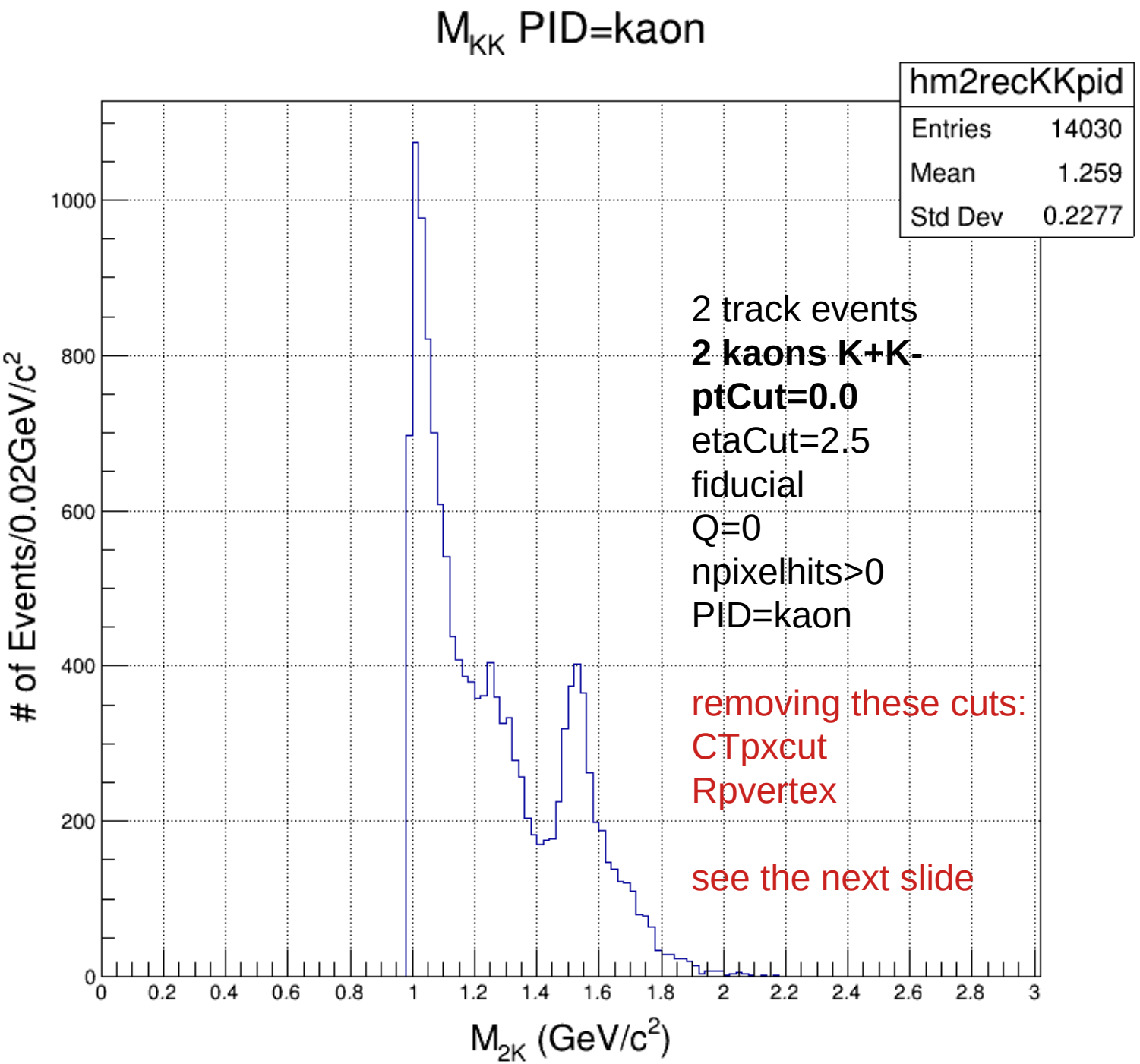




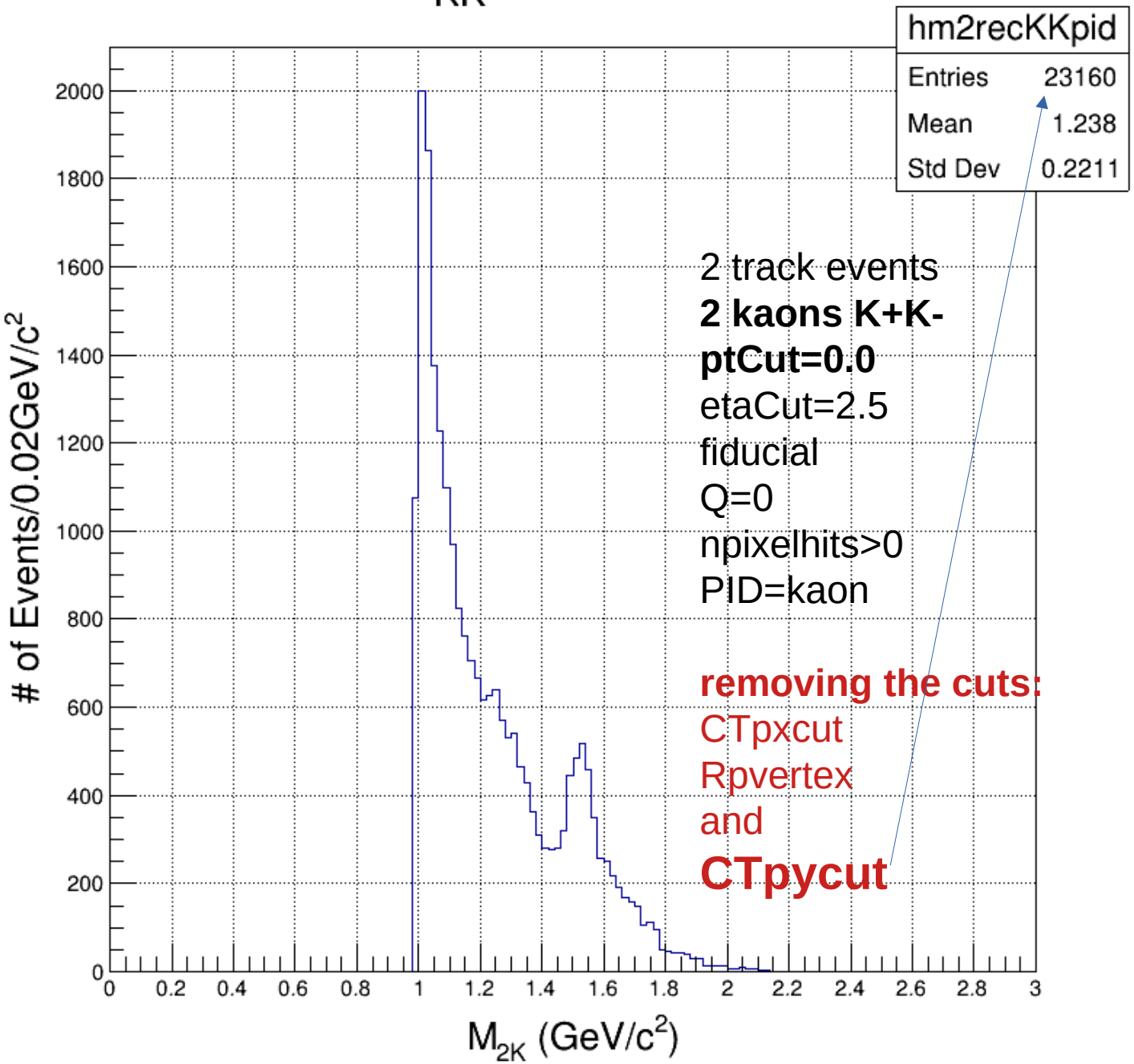

$M_{\pi\pi}$ OS
hm2rec2OS
Entries 582738
Mean 0.8661
Std Dev 0.3768
2 track events
2 pions pi+pi-
ptCut=0.0
etaCut=2.5
fiducial
Q=0
npixelhits>0
CTpycut
CTpxcut
Rpvertex
no PID
# of Events/0.02GeV/c^2
$M_{2\pi}$ (GeV/c^2)
0
2000
4000
6000
8000
10000
12000
14000
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4

M_{KK} PID=kaon

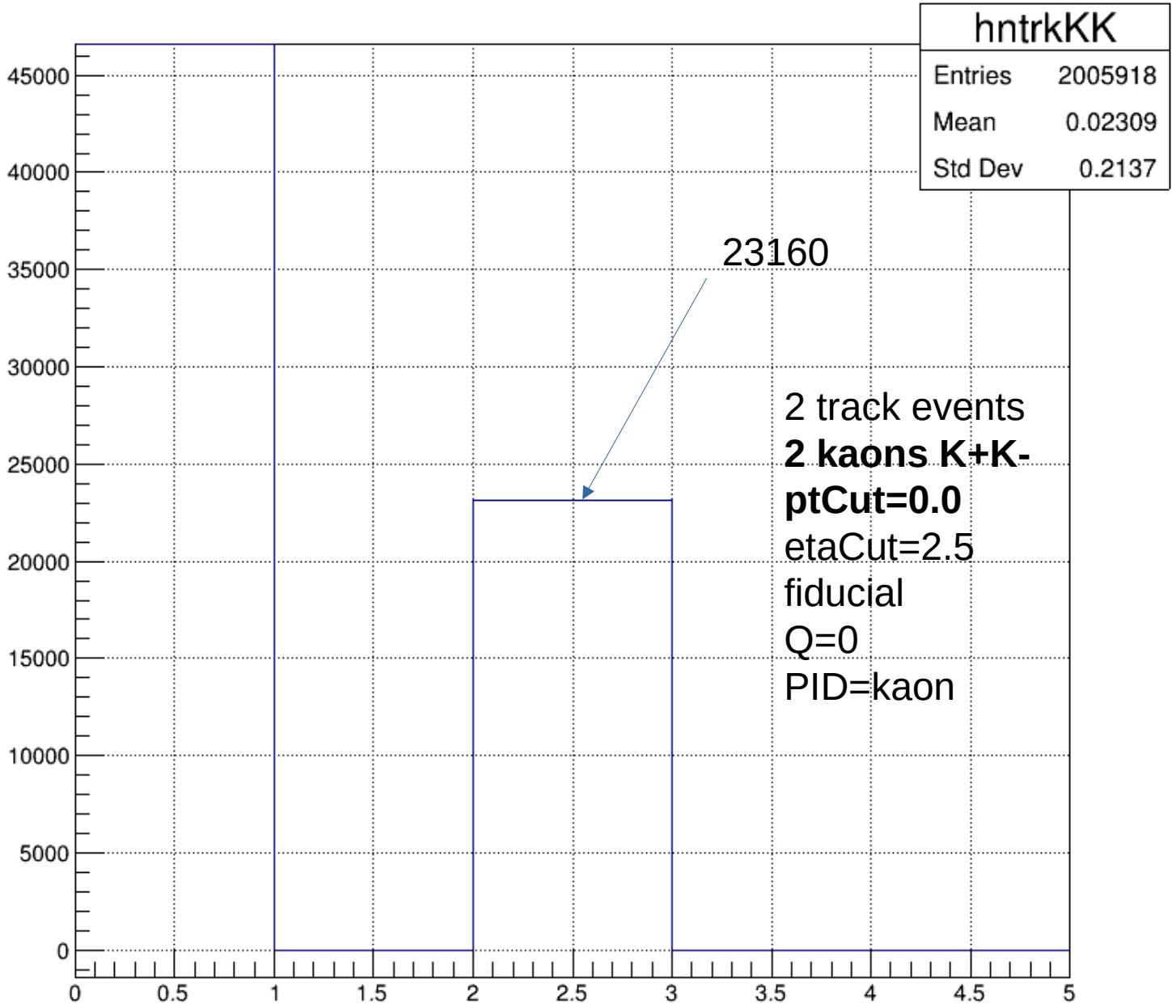

hm2rec2KKpid
Entries 11013
Mean 1.279
Std Dev 0.2293
2 track events
2 kaons K+K-
ptCut=0.0
etaCut=2.5
fiducial
Q=0
npixelhits>0
CTpycut
CTpxcut
Rpvertex
PID=kaon
see the next slide
# of Events/0.02GeV/c²
M2K (GeV/c²)
0
100
200
300
400
500
600
700
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

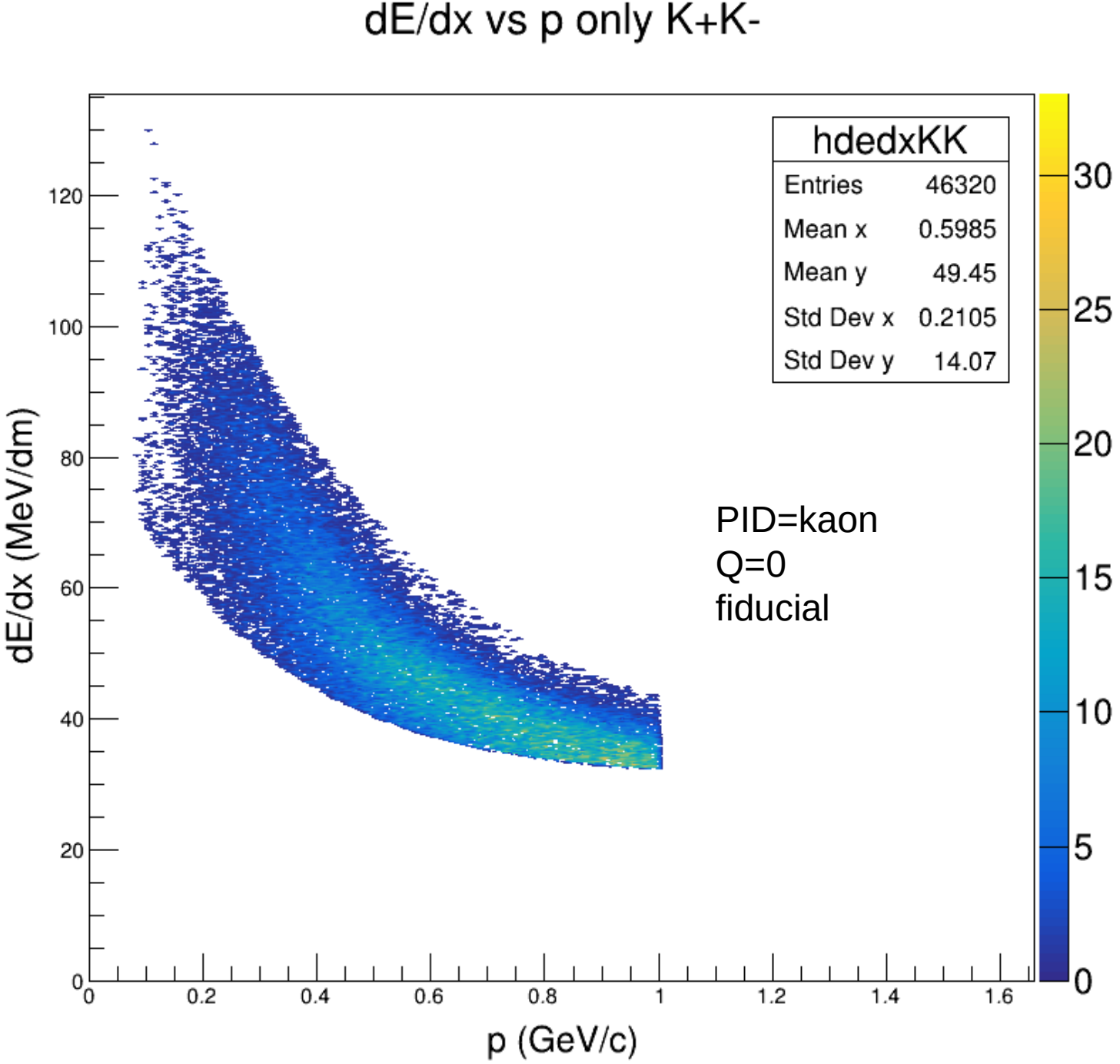

M_{KK} PID=kaon
hm2recKKpid
Entries 14030
Mean 1.259
Std Dev 0.2277
2 track events
2 kaons K+K-
ptCut=0.0
etaCut=2.5
fiducial
Q=0
npixelhits>0
PID=kaon
removing these cuts:
CTpxcut
Rpvertex
see the next slide
# of Events/0.02GeV/c^2
M_{2K} (GeV/c^2)
0
200
400
600
800
1000
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3

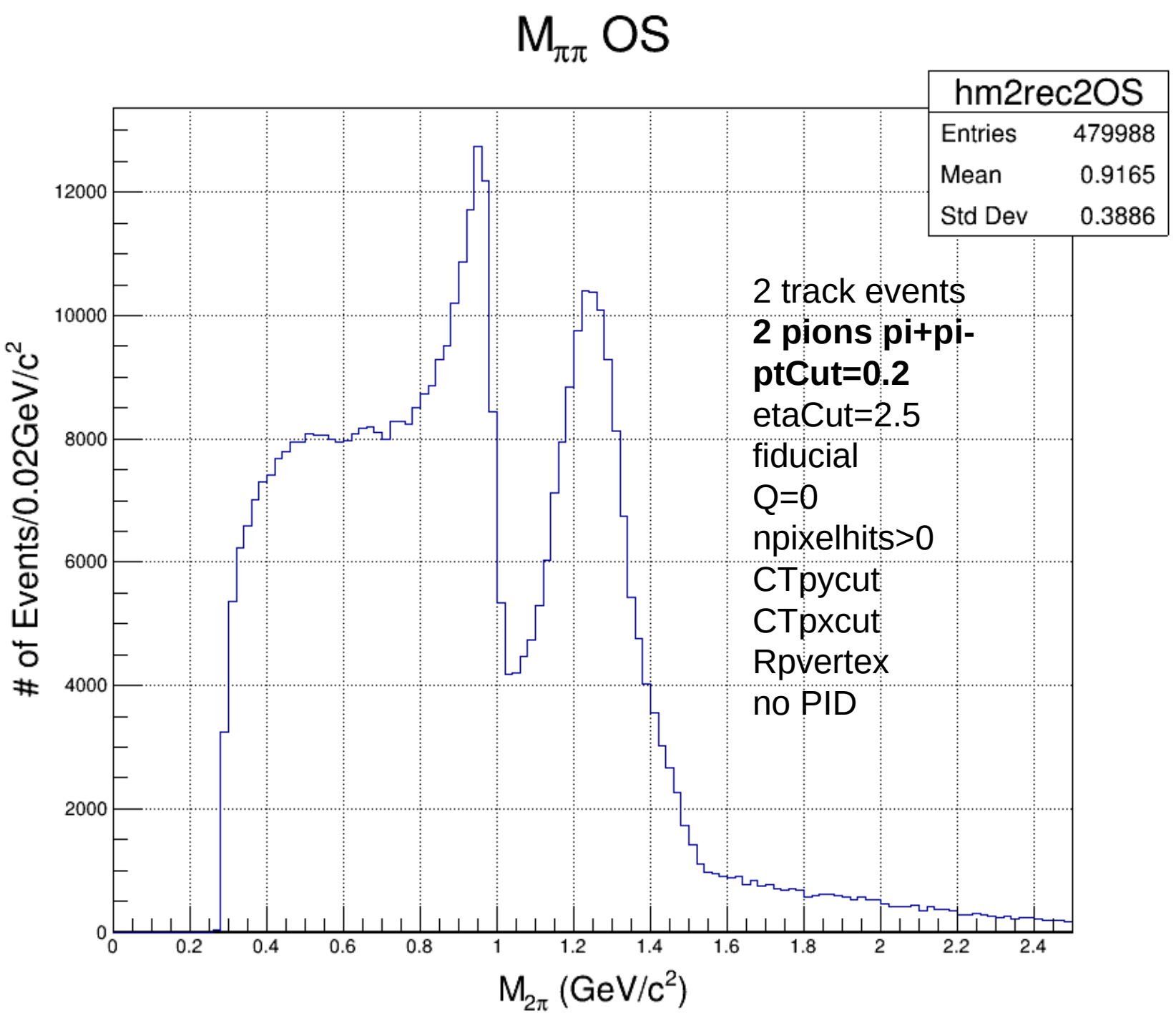
M_{KK} PID=kaon


hm2recKKpid
Entries 23160
Mean 1.238
Std Dev 0.2211
2 track events
2 kaons K+K-
ptCut=0.0
etaCut=2.5
fiducial
Q=0
npixelhits>0
PID=kaon
removing the cuts:
CTpxcut
Rpvertex
and
CTpycut
# of Events/0.02GeV/c²
M2K (GeV/c²)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

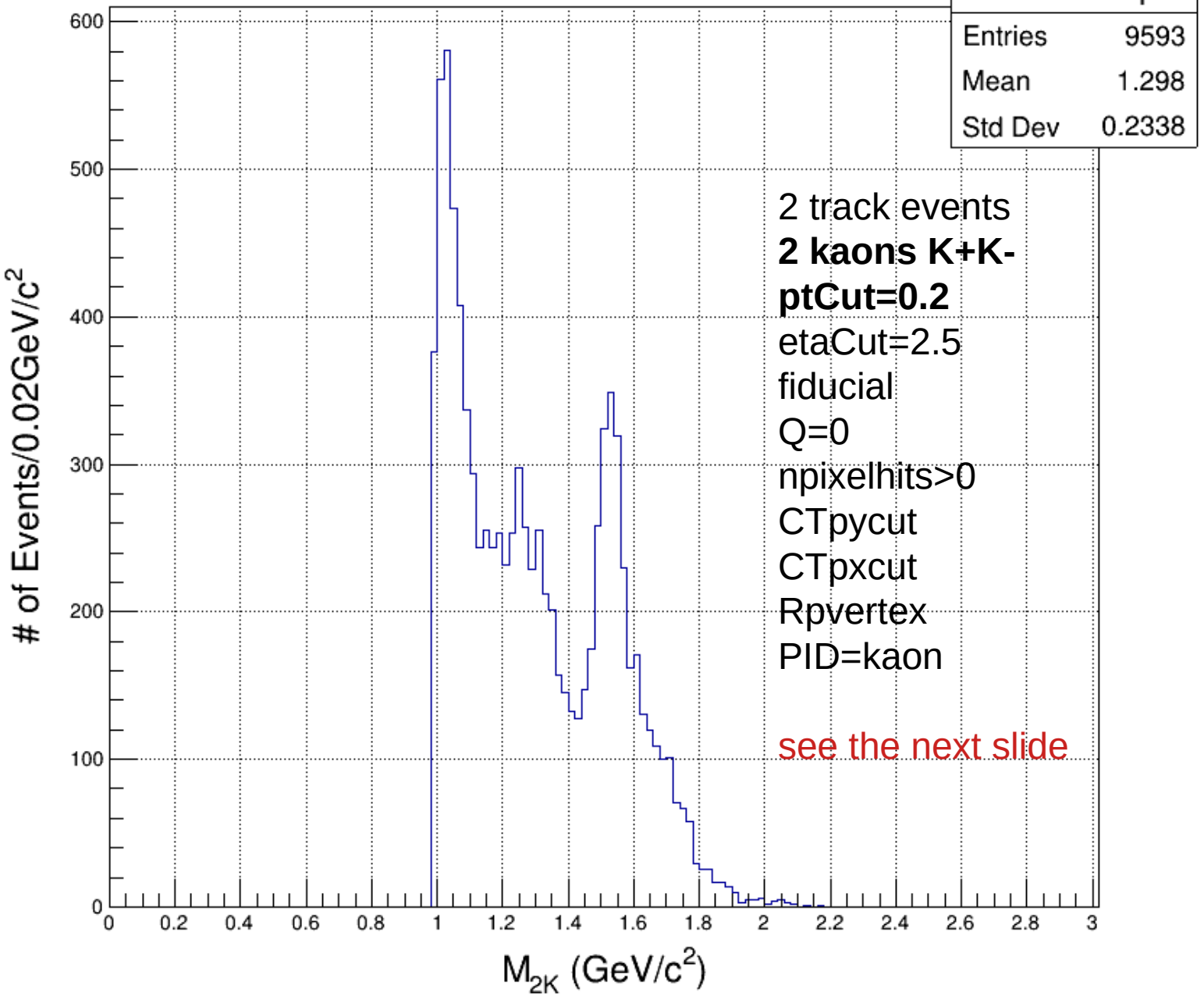
of K+K-


hntrkKK
Entries 2005918
Mean 0.02309
Std Dev 0.2137
23160
2 track events
2 kaons K+K-
ptCut=0.0
etaCut=2.5
fiducial
Q=0
PID=kaon
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5

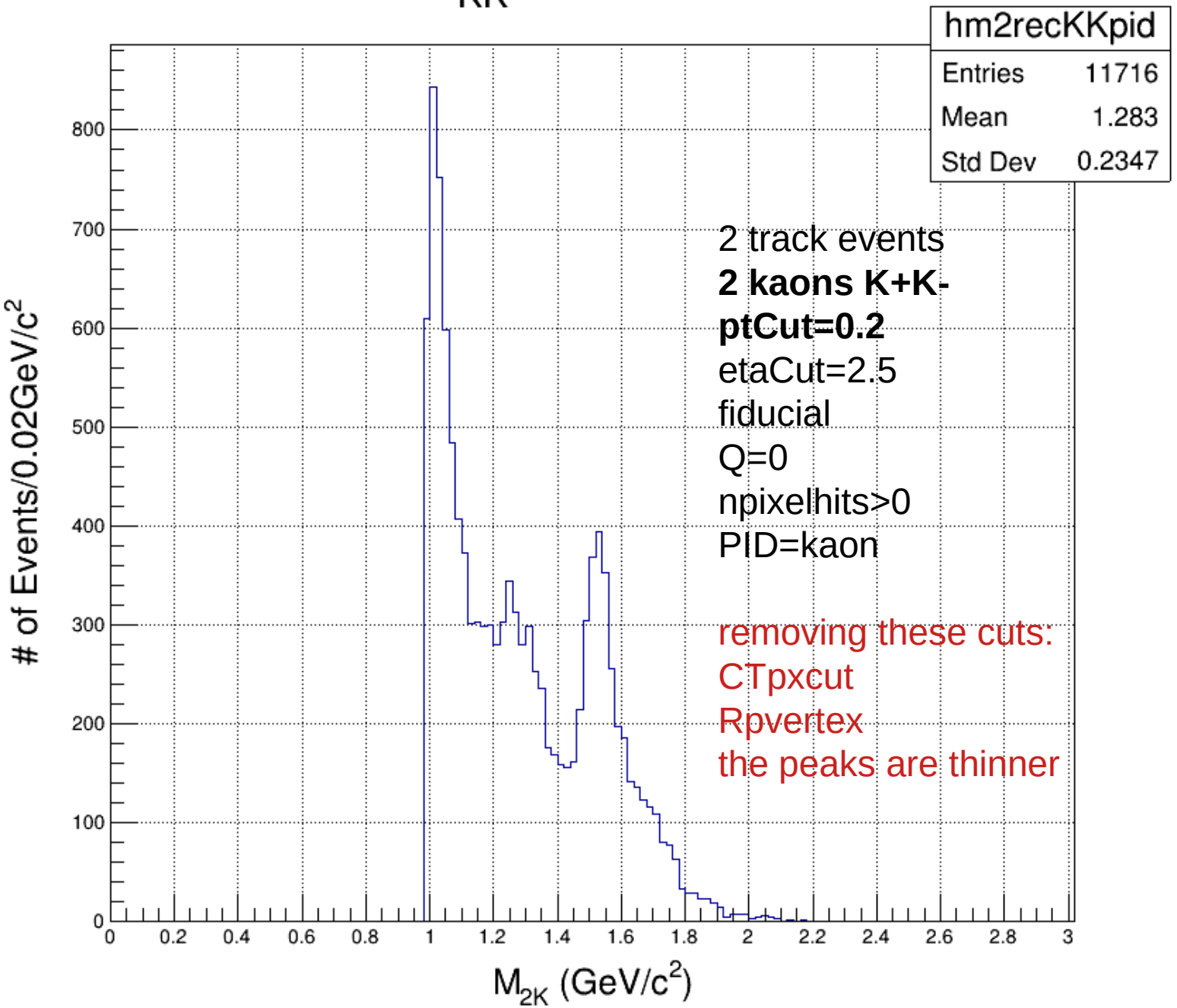

dE/dx vs p only K+K-
hdedxKK
Entries 46320
Mean x 0.5985
Mean y 49.45
Std Dev x 0.2105
Std Dev y 14.07
PID=kaon
Q=0
fiducial
dE/dx (MeV/dm)
p (GeV/c)
0
20
40
60
80
100
120
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
0
5
10
15
20
25
30


$M_{\pi\pi}$ OS
hm2rec2OS
Entries 479988
Mean 0.9165
Std Dev 0.3886
2 track events
2 pions pi+pi-
ptCut=0.2
etaCut=2.5
fiducial
Q=0
npixelhits>0
CTpycut
CTpxcut
Rpvertex
no PID
# of Events/0.02GeV/c^2
$M_{2\pi}$ (GeV/c^2)
0
2000
4000
6000
8000
10000
12000
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4

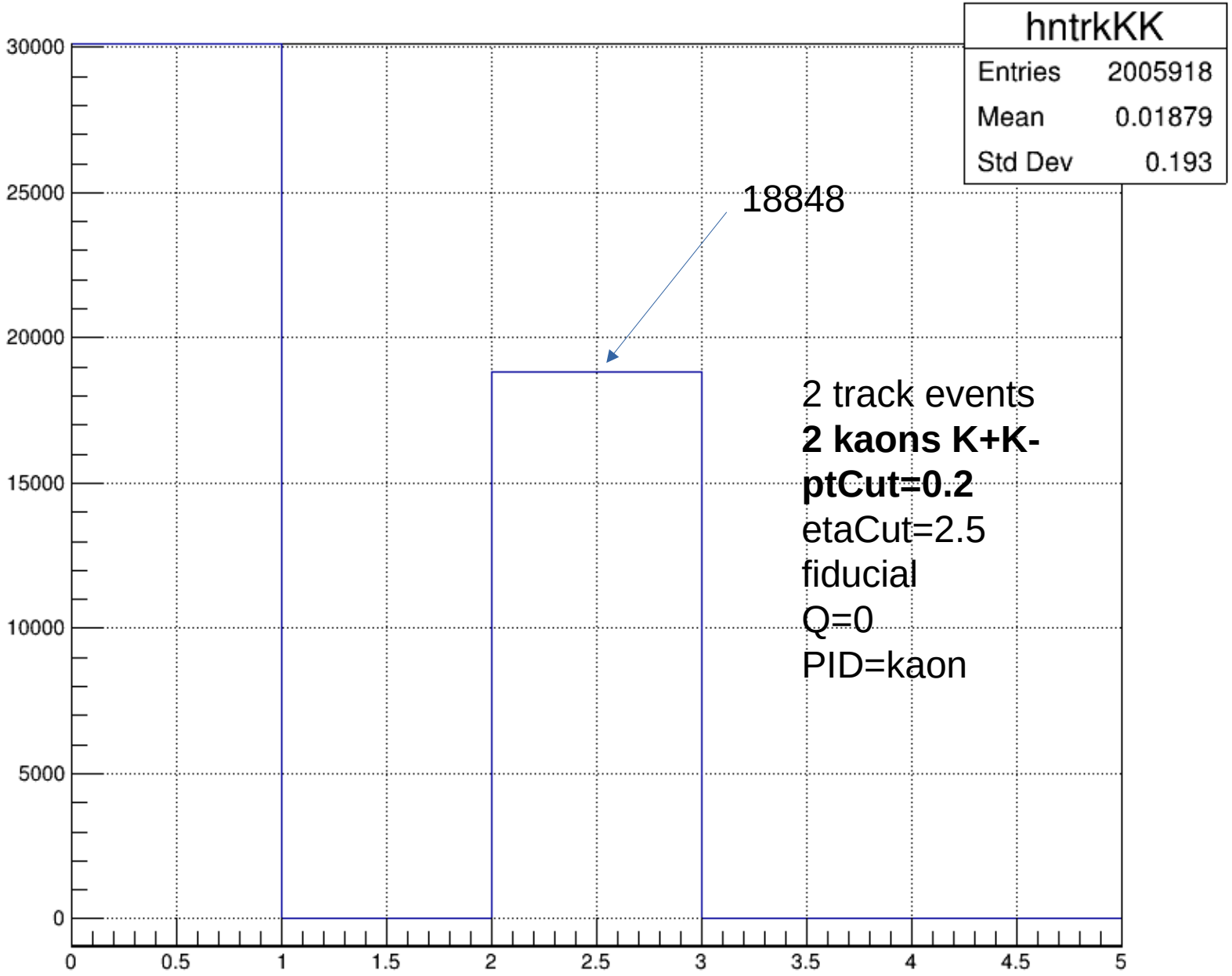
M_{KK} PID=kaon

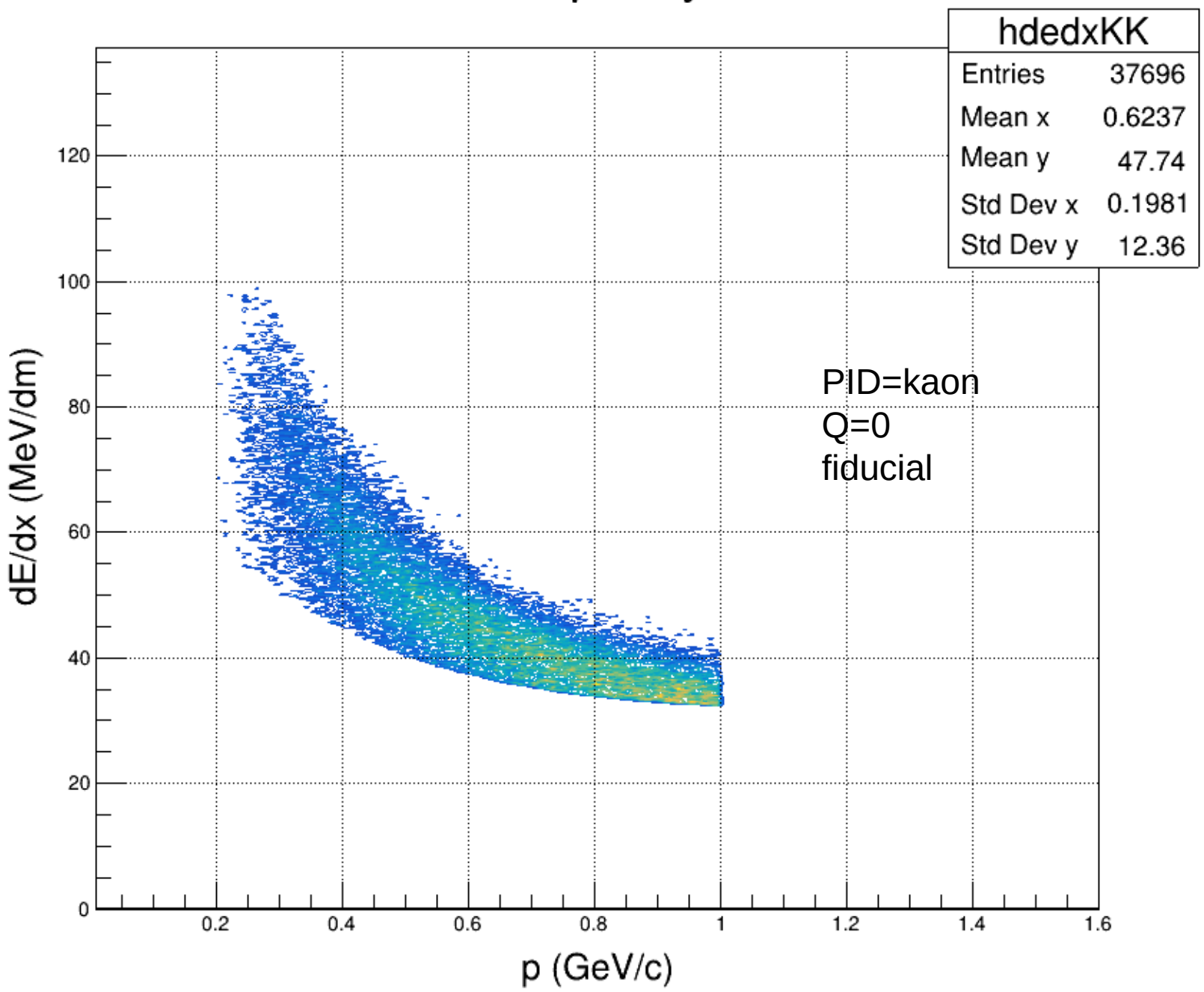

hm2rec2KKpid
Entries 9593
Mean 1.298
Std Dev 0.2338
2 track events
2 kaons K+K-
ptCut=0.2
etaCut=2.5
fiducial
Q=0
npixelhits>0
CTpycut
CTpxcut
Rpvertex
PID=kaon
see the next slide
# of Events/0.02GeV/c²
M2K (GeV/c²)
0
100
200
300
400
500
600
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

M_{KK} PID=kaon

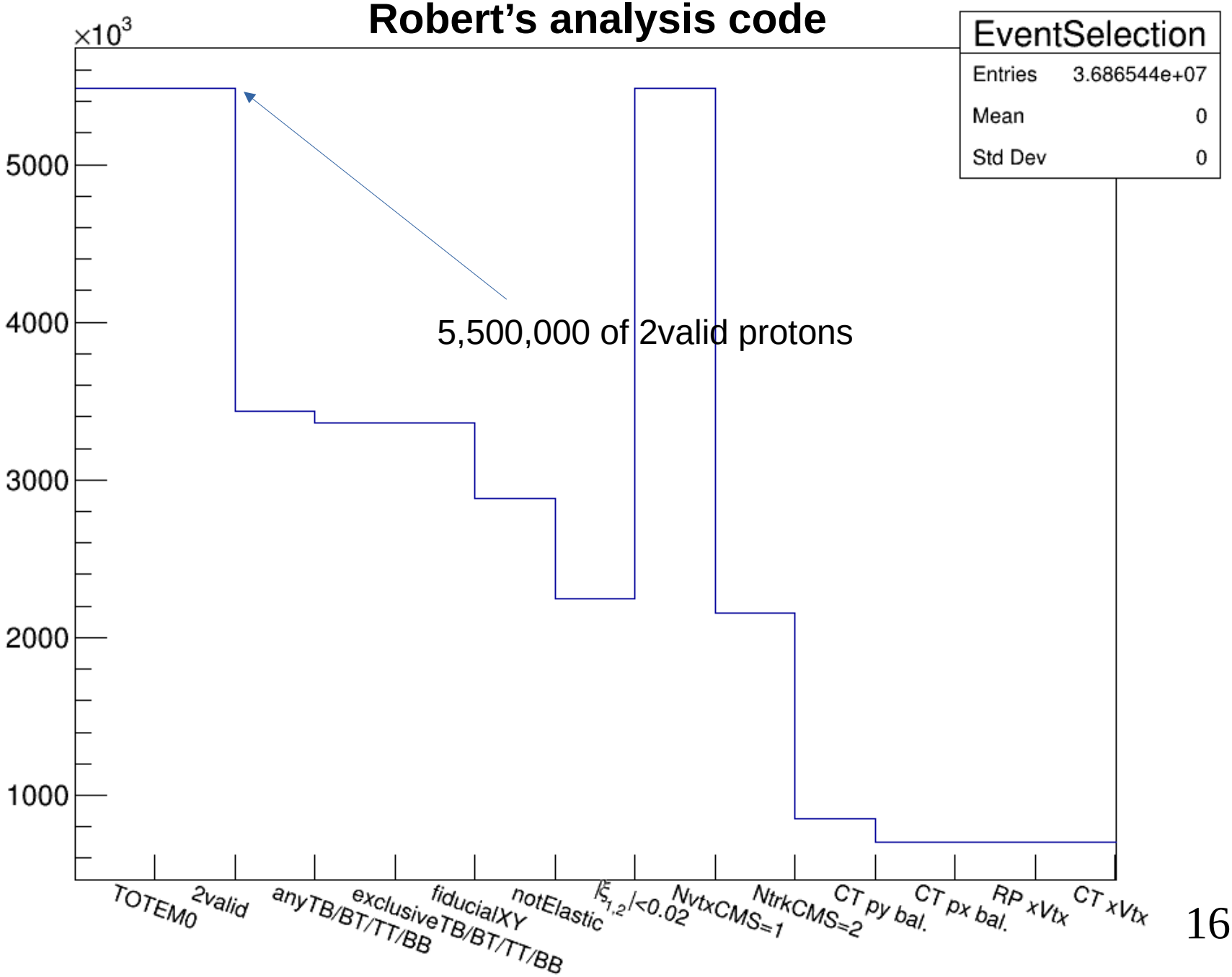

hm2recKKpid
Entries 11716
Mean 1.283
Std Dev 0.2347
2 track events
2 kaons K+K-
ptCut=0.2
etaCut=2.5
fiducial
Q=0
npixelhits>0
PID=kaon
removing these cuts:
CTpxcut
Rpvertex
the peaks are thinner
# of Events/0.02GeV/c²
M2K (GeV/c²)
0
100
200
300
400
500
600
700
800
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3

of K+K-

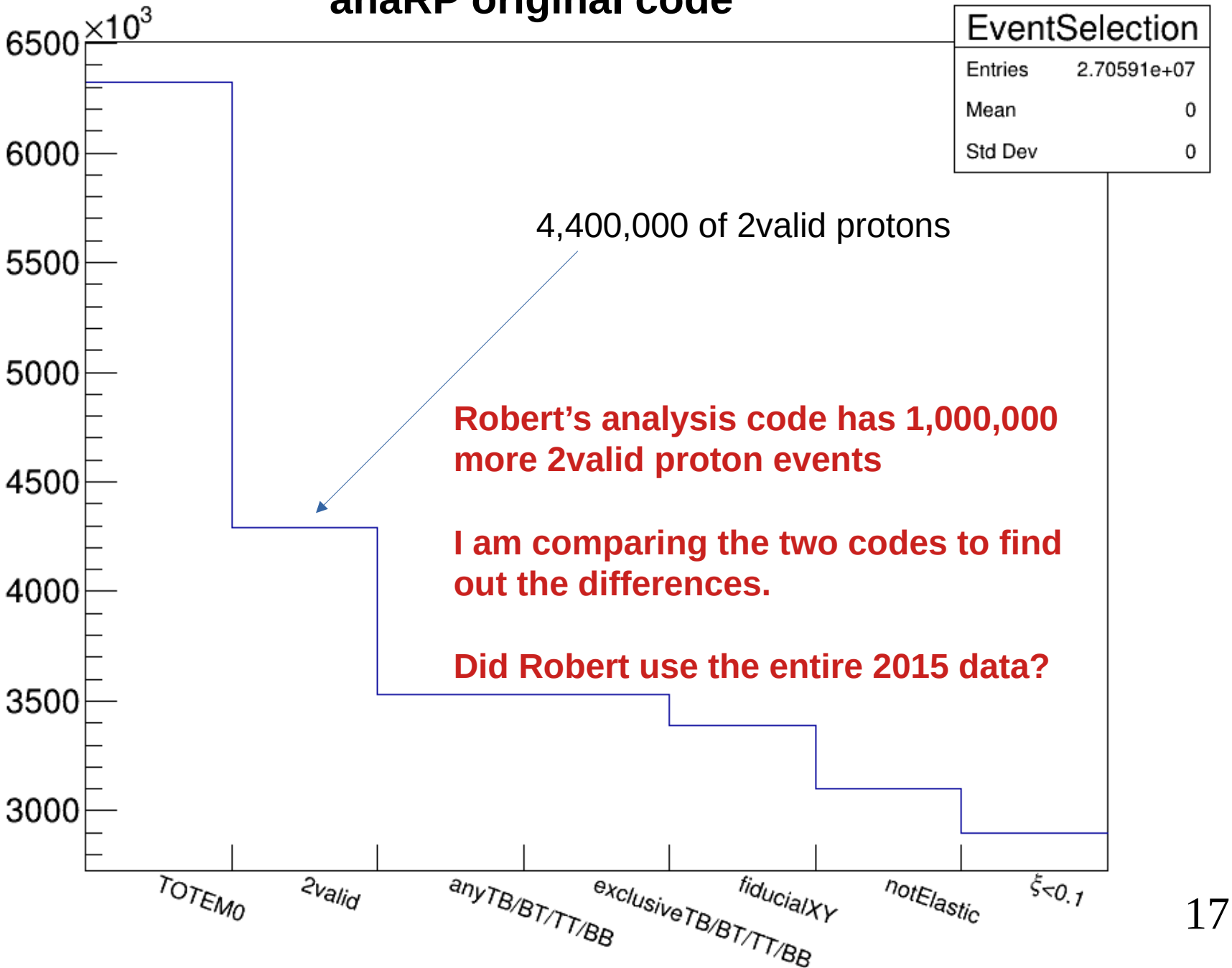

hntrkKK
Entries 2005918
Mean 0.01879
Std Dev 0.193
18848
2 track events
2 kaons K+K-
ptCut=0.2
etaCut=2.5
fiducial
Q=0
PID=kaon
30000
25000
20000
15000
10000
5000
0
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5


dE/dx vs p only K+K-
hdedxKK
Entries 37696
Mean x 0.6237
Mean y 47.74
Std Dev x 0.1981
Std Dev y 12.36
PID=kaon
Q=0
fiducial
dE/dx (MeV/dm)
p (GeV/c)
0
20
40
60
80
100
120
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6

Robert's analysis code



anaRP original code



M_{KK} PID=kaon vs pt_{KK}