p-X-p Analysis - Kshorts

dE/dx efficiency
M(Kpi) new algorithm

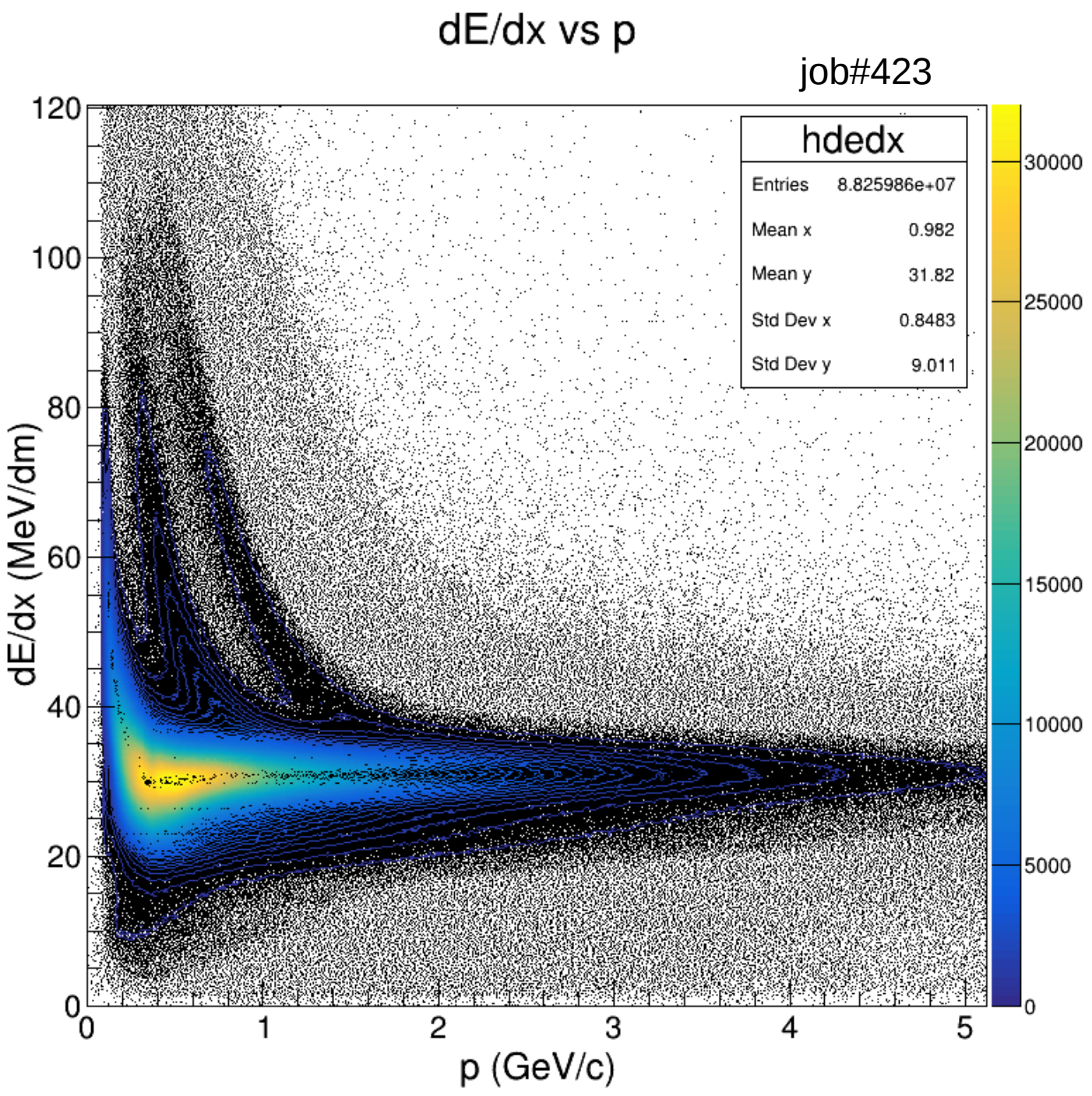
entire 2015 data

4-track events

type:02 events – K0sK0s

type:11 events – K0sK*

negating Lambda events


dE/dx vs p
job#423
hdedx
Entries 8.825986e+07
Mean x 0.982
Mean y 31.82
Std Dev x 0.8483
Std Dev y 9.011
dE/dx (MeV/dm)
p (GeV/c)
0
20
40
60
80
100
120
0
1
2
3
4
5
0
5000
10000
15000
20000
25000
30000

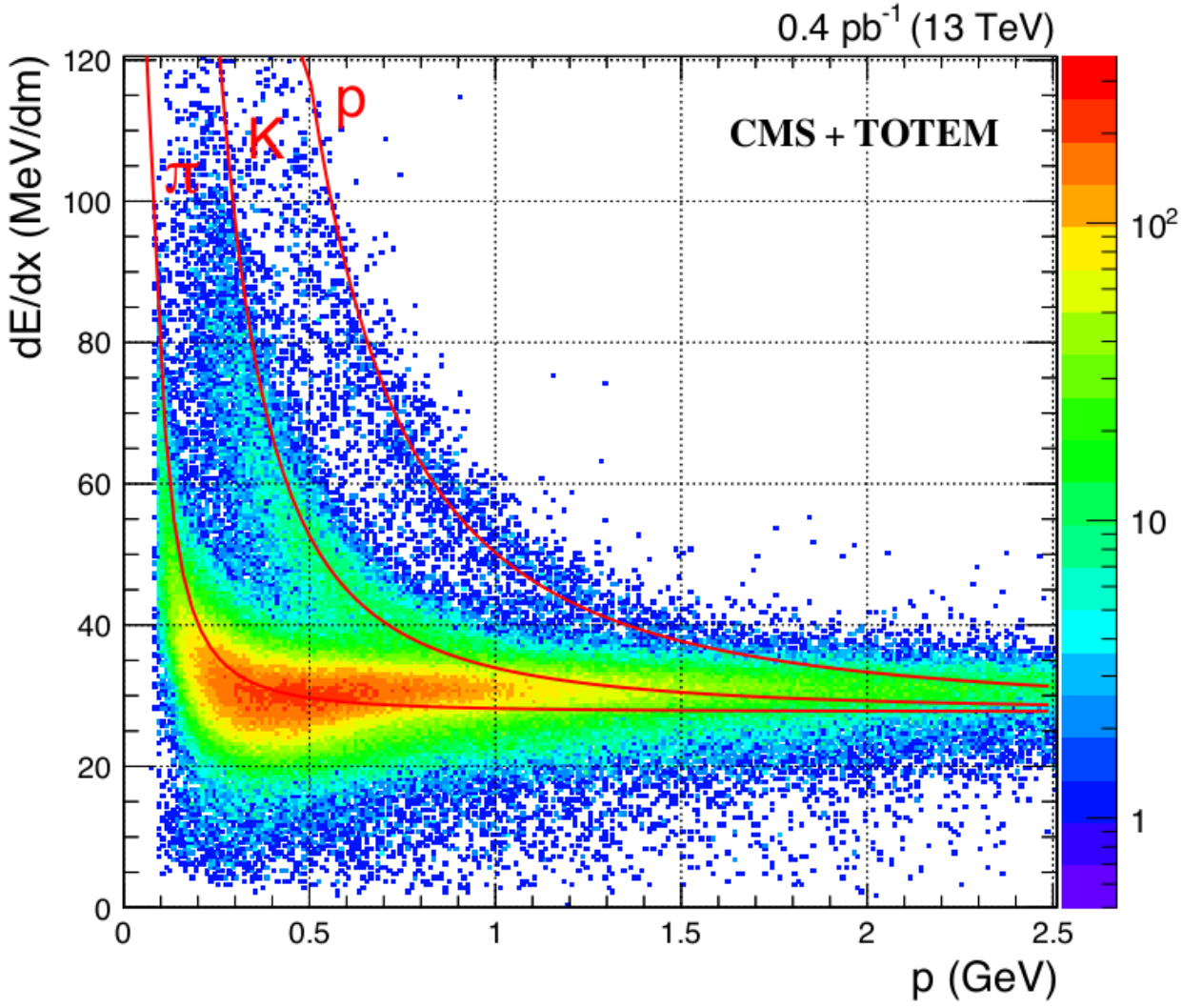


Figure 13: Distribution of the track energy loss dE/dx versus momentum, for tracks in the four-track sample. Solid (red) lines, corresponding to a simplified parameterization of the mean energy loss for pions, kaons and protons [51], are shown to guide the eye.

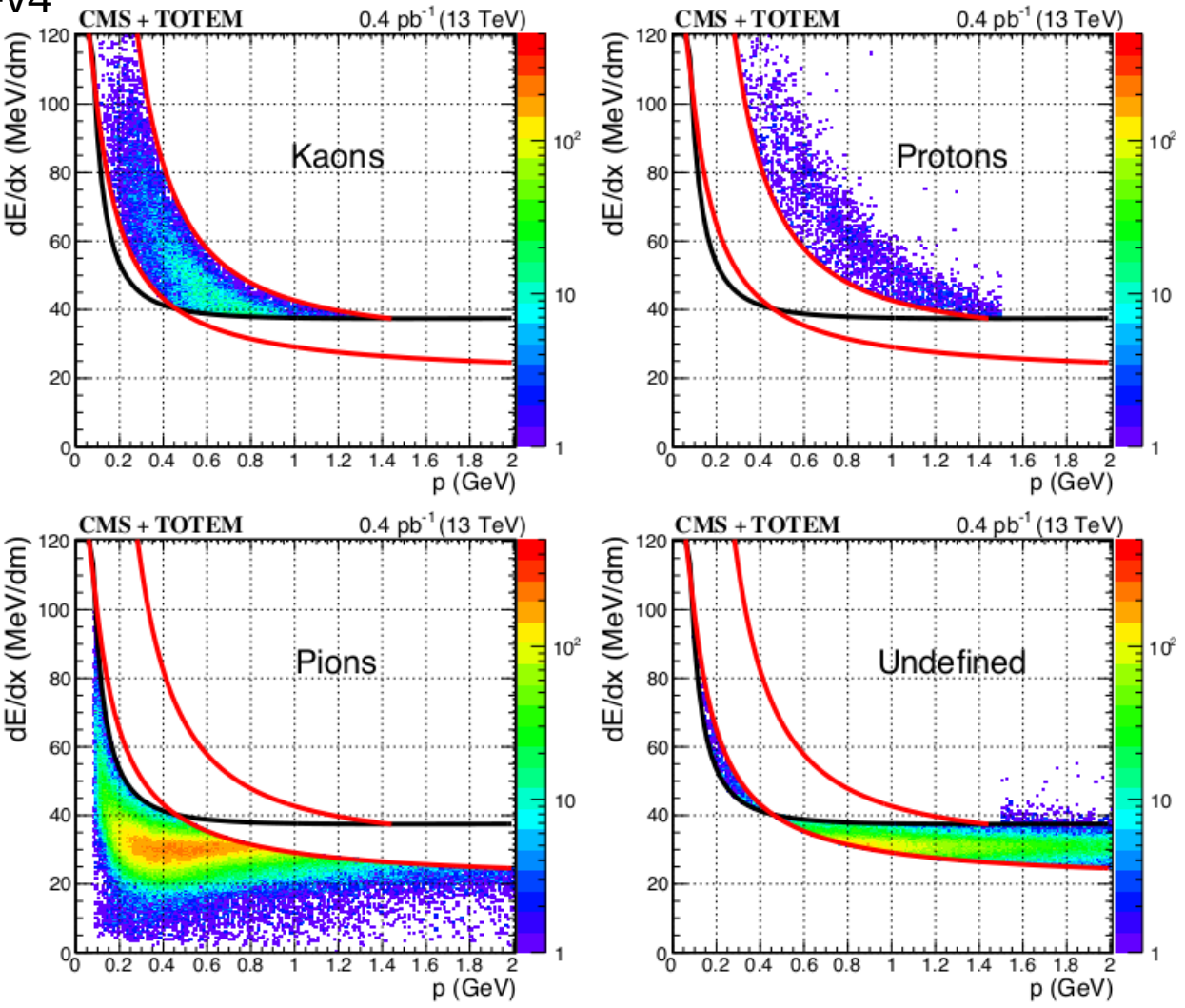
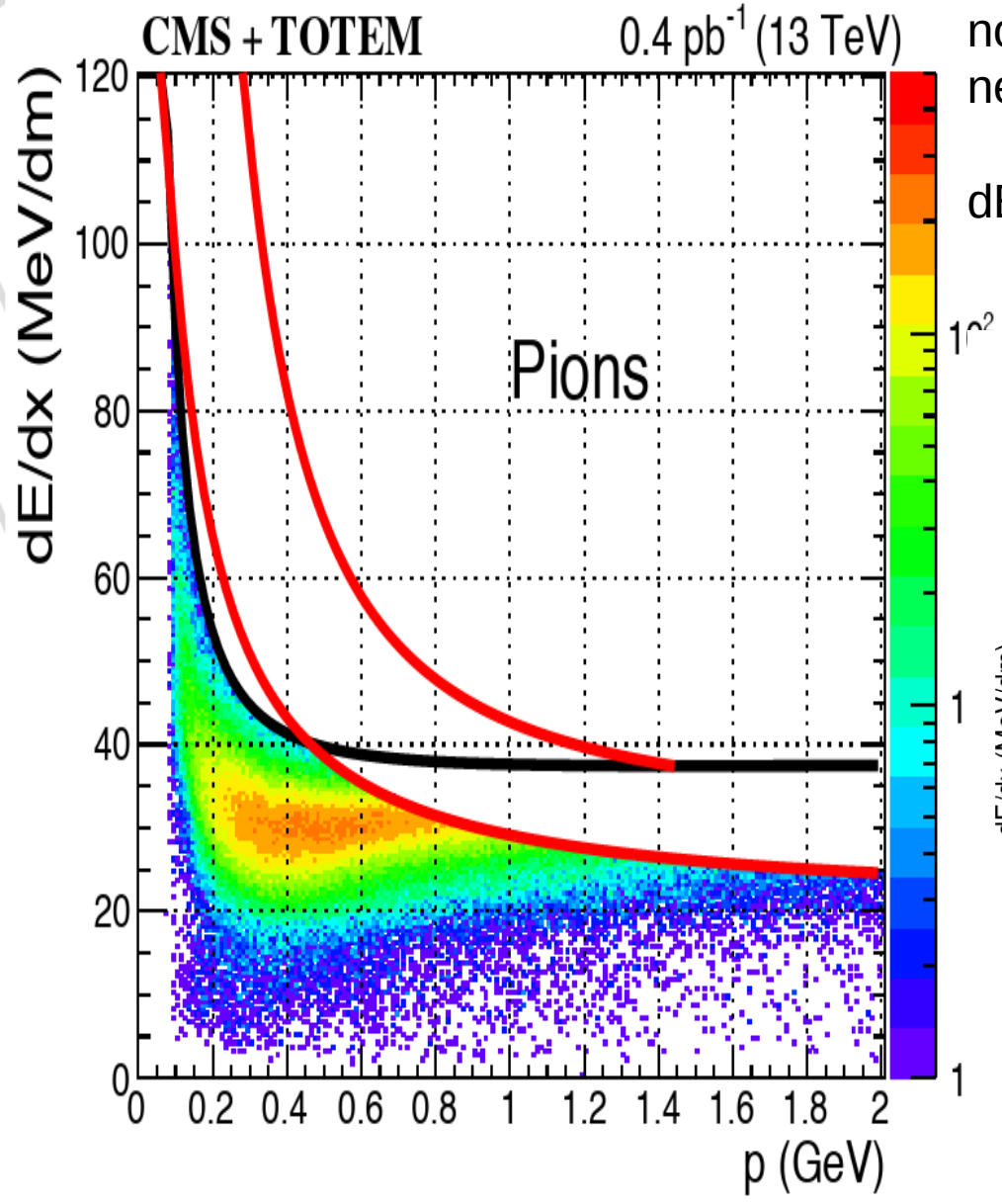


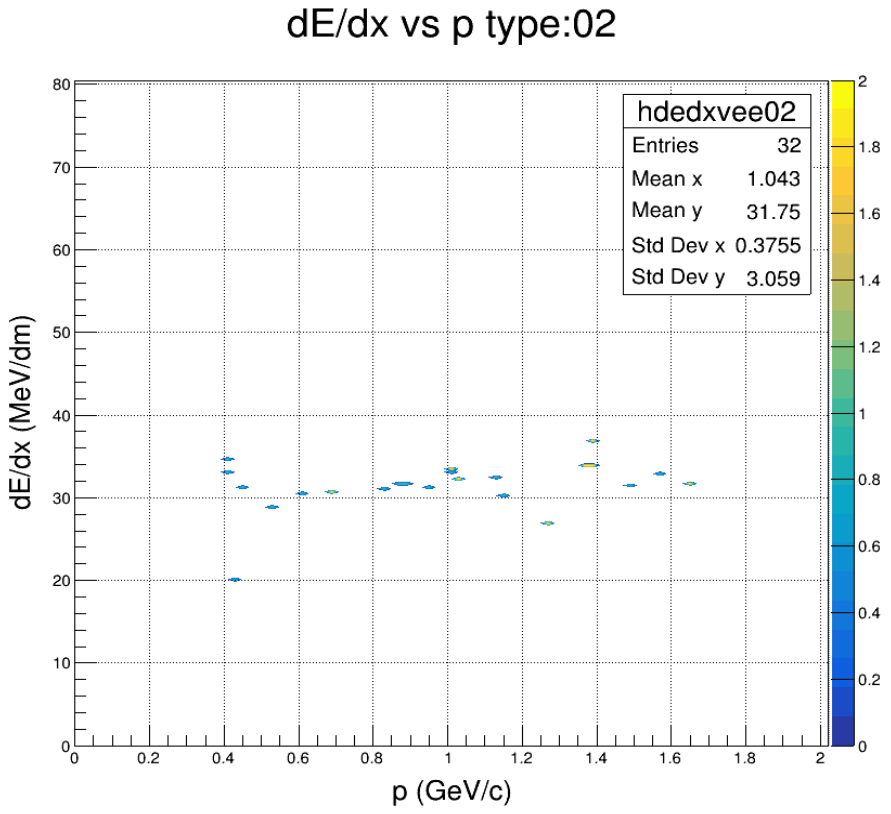
Figure 17: Particle identification in the dE/dx vs p space. Entries populate regions, in which tracks are classified as pions (**bottom left**), kaons (**top left**), protons (**top right**), or remain undefined (**bottom right**). Red curves bracket the $\pm 2.56\sigma$ region around the kaon average dE/dx, while the black curve marks the $+2.56\sigma$ bound above the pion average dE/dx.

AN2017-268-v4

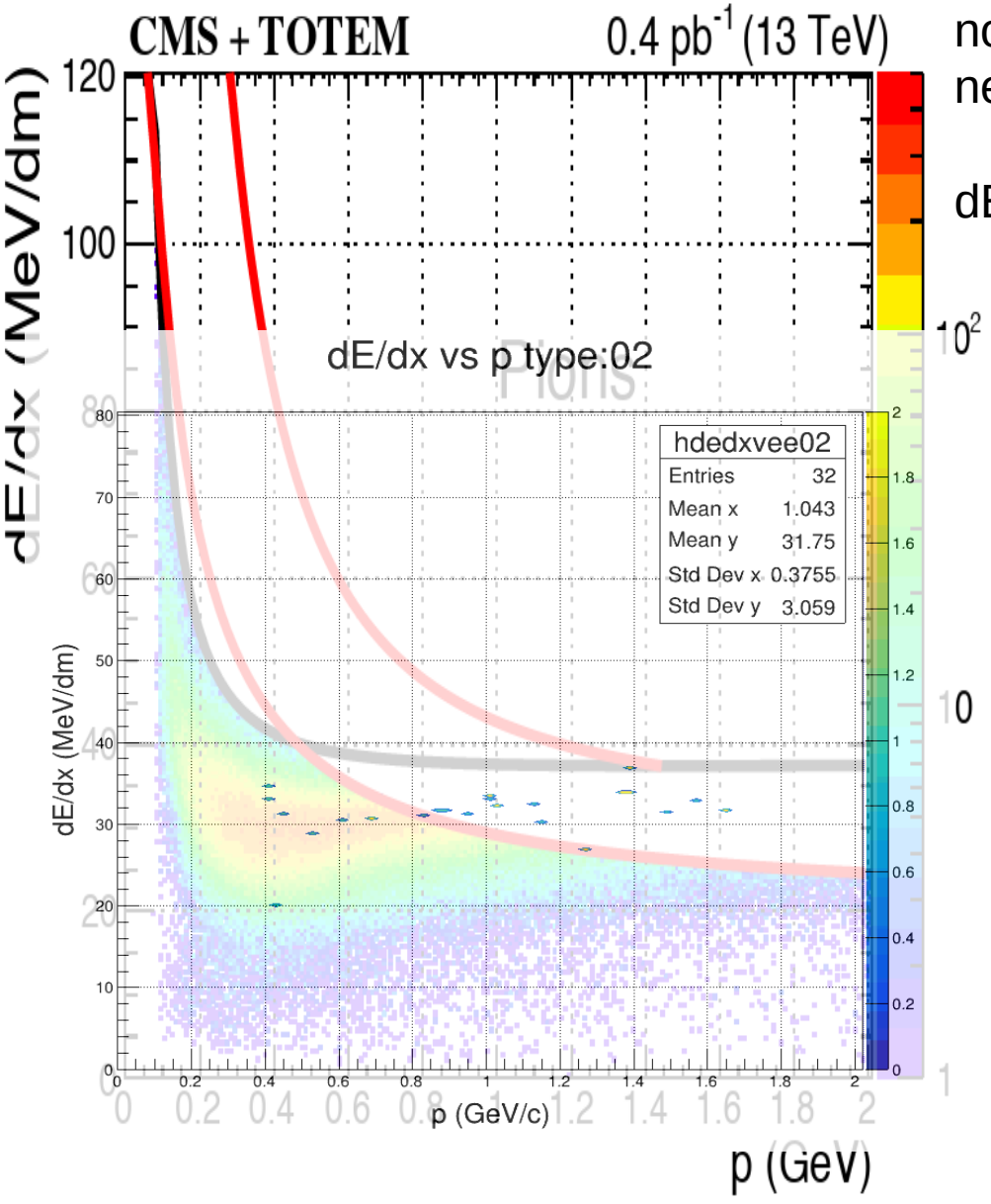
entries = tracks , 4-track events
32 entries = 8 events , type:02 events
no primary & 2 Vees
negating Lambda events

dE/dx algorithm is killing the K0sK0s events





AN2017-268-v4

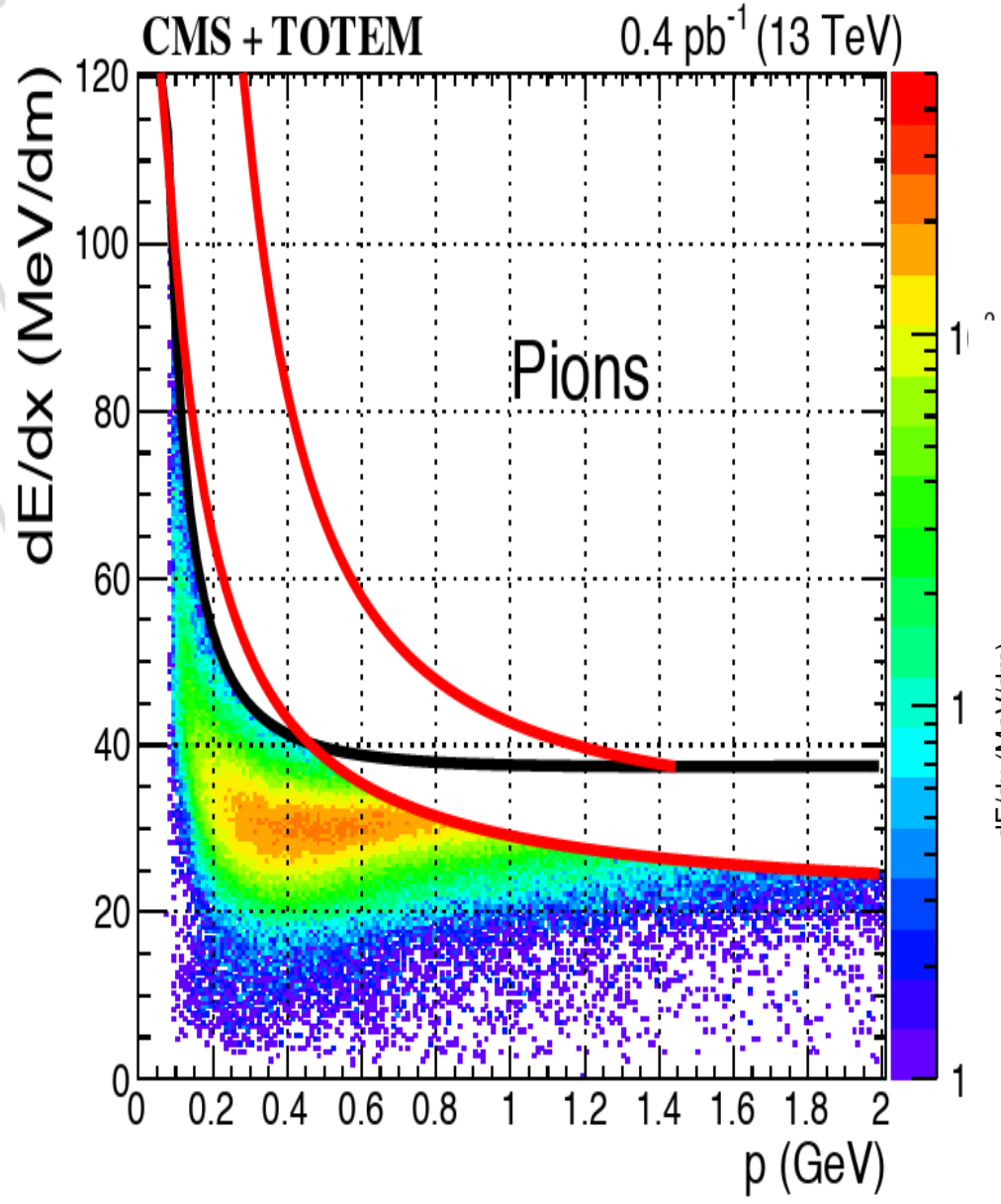


entries = tracks , 4-track events
32 entries = 8 events , type:02 events
no primary & 2 Vees
negating Lambda events

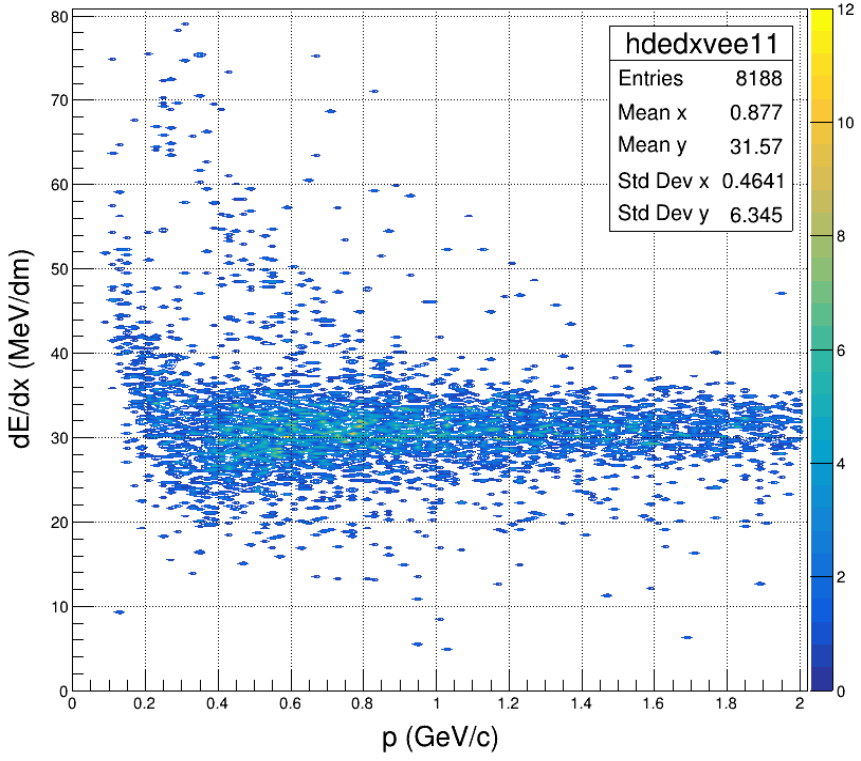
dE/dx algorithm is killing the K0sK0s events

AN2017-268-v4

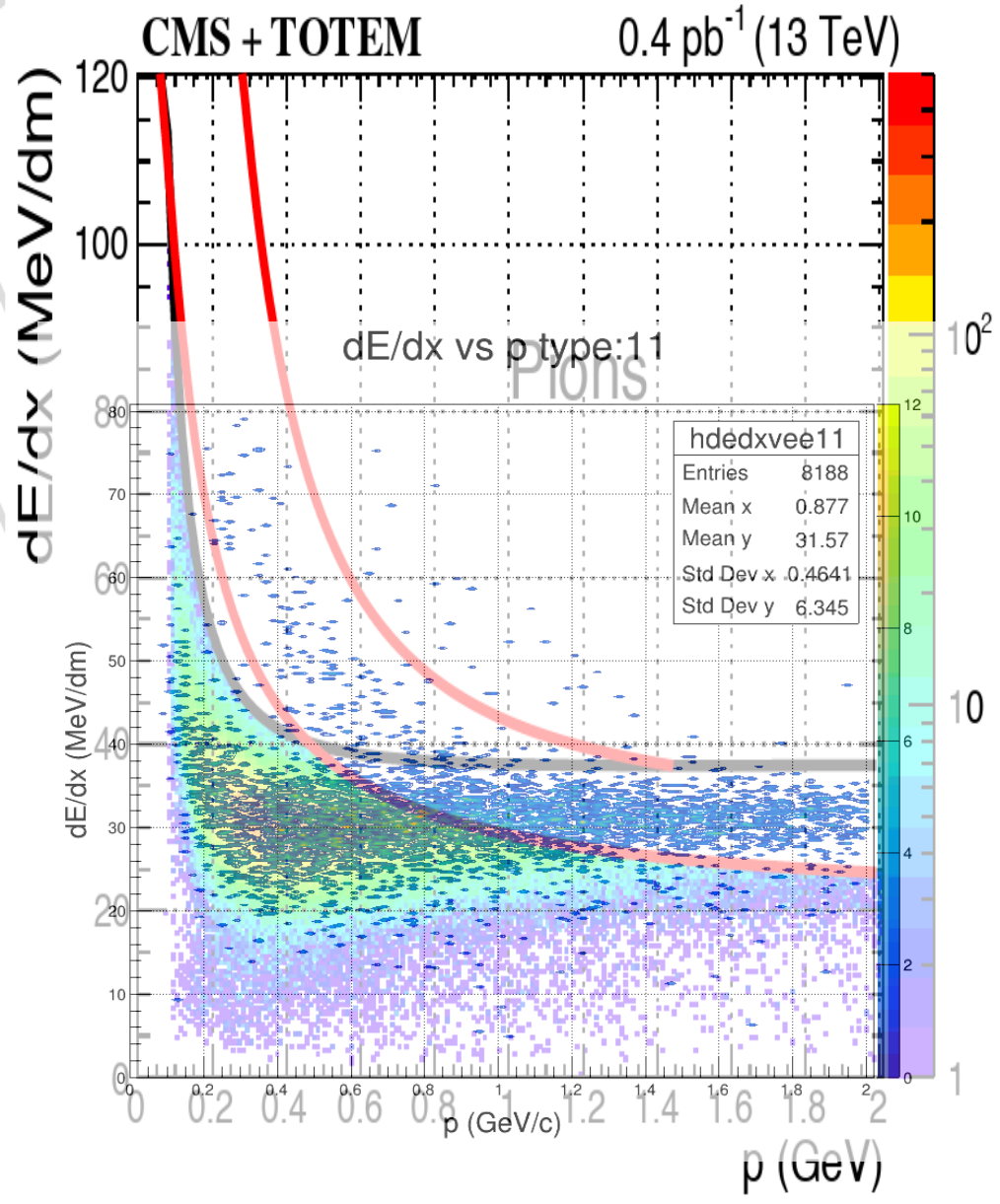
entries = tracks 4-track events
8188 entries = 2047 events
type:11 events
1 primary & 1 Vee
negating Lambda events
dE/dx algorithm is rejecting most of the K0sK* events



dE/dx vs p type:11



AN2017-268-v4



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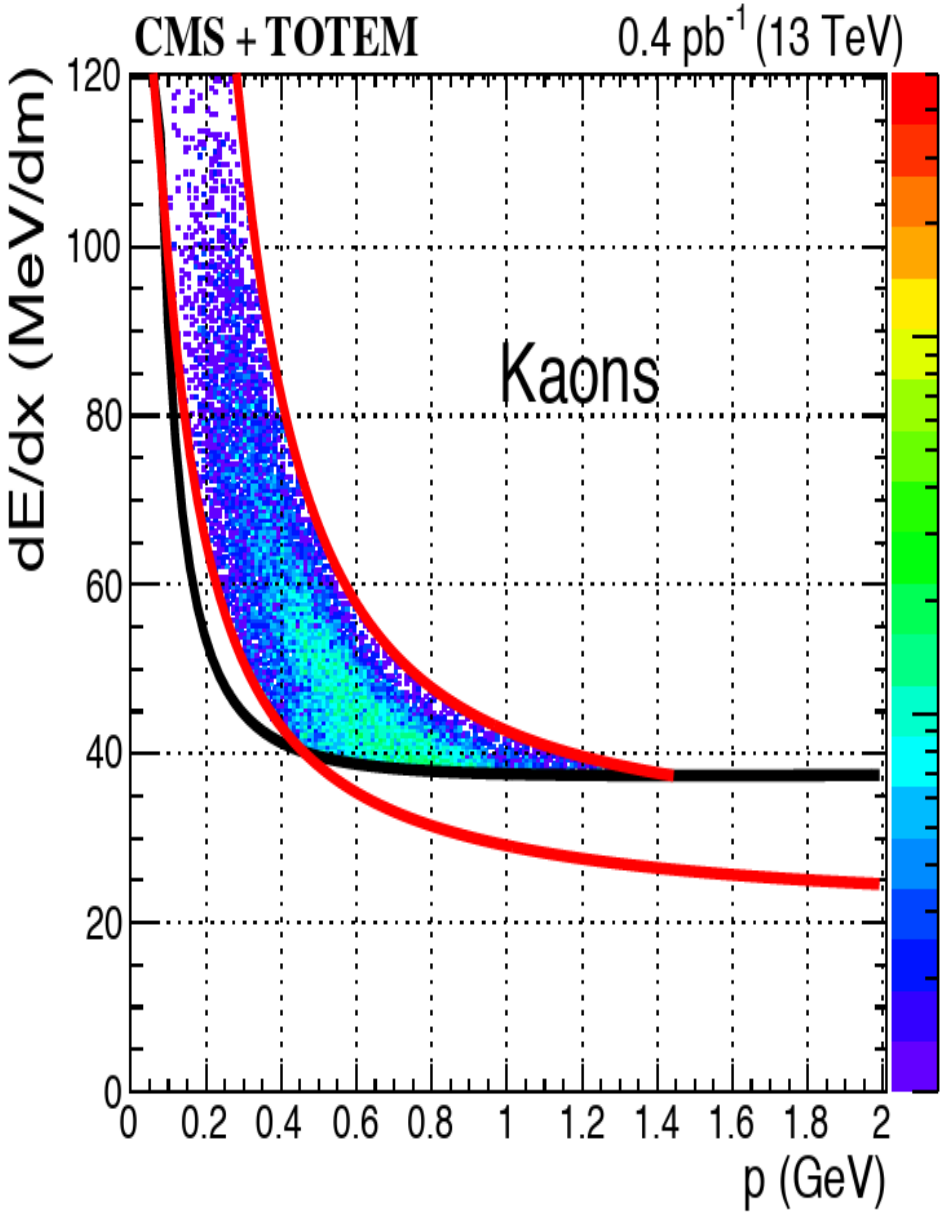
AN2017-268-v4



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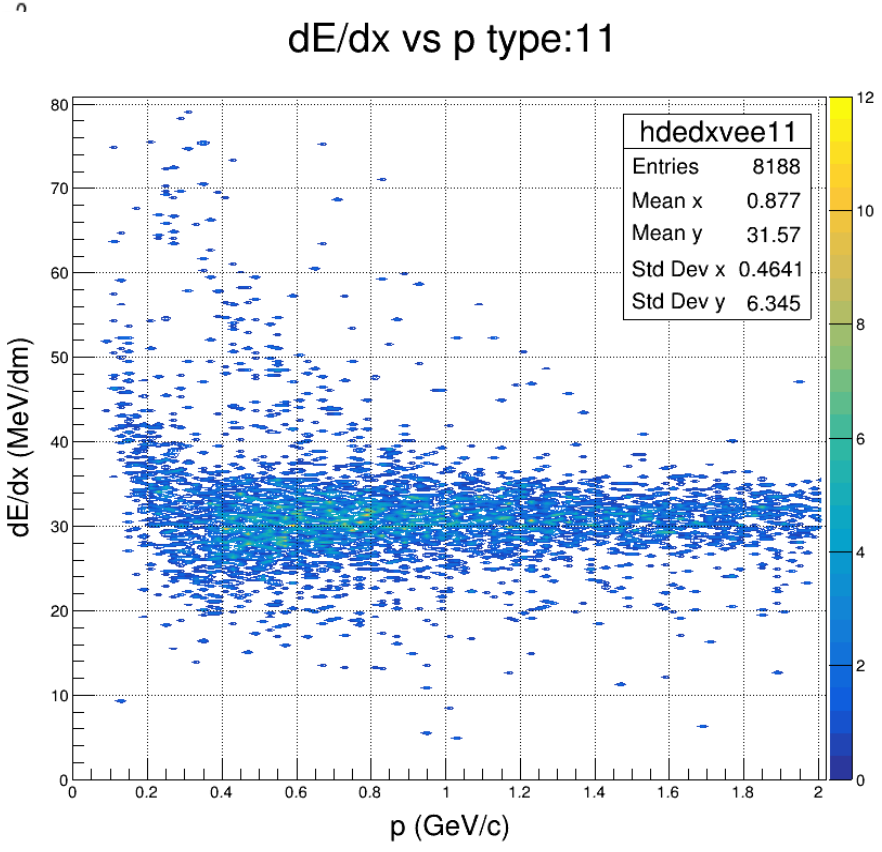
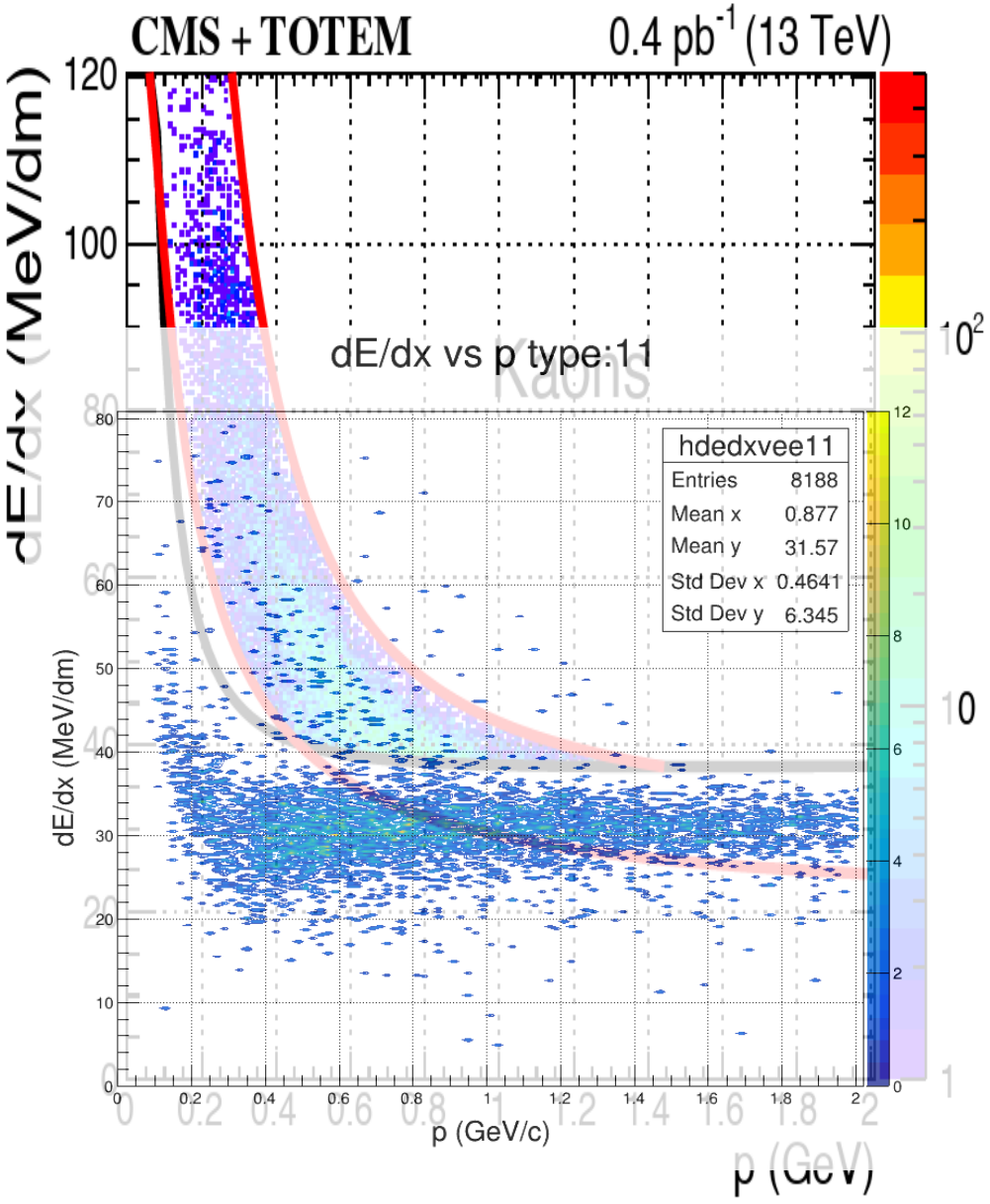
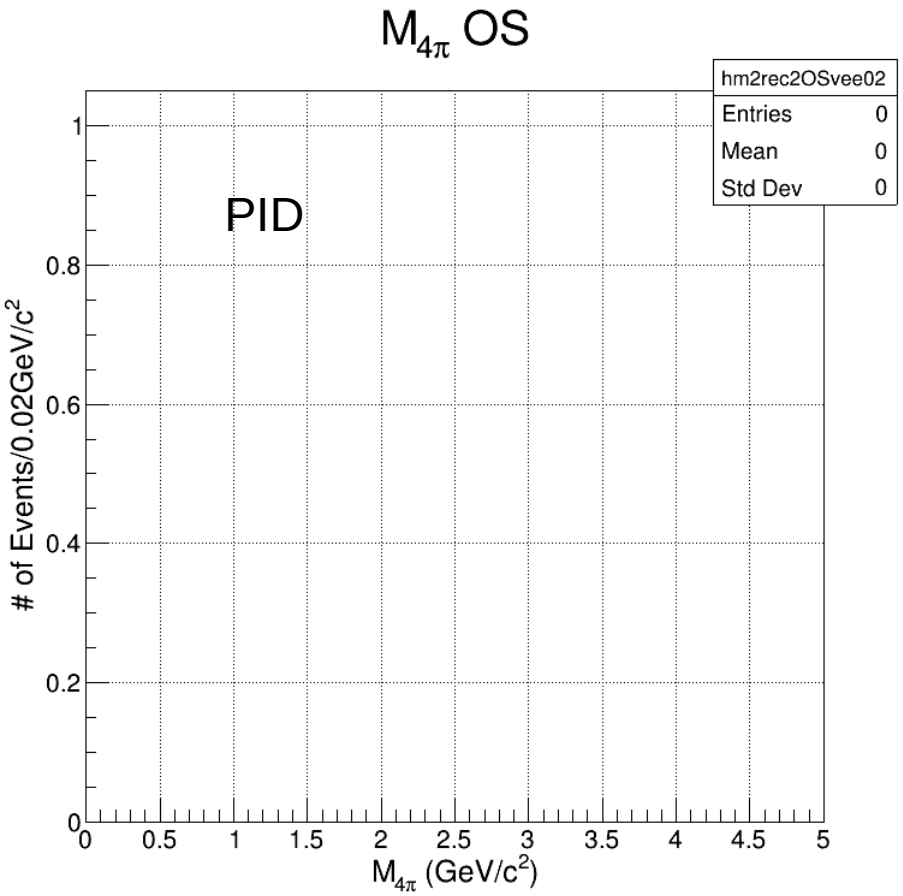


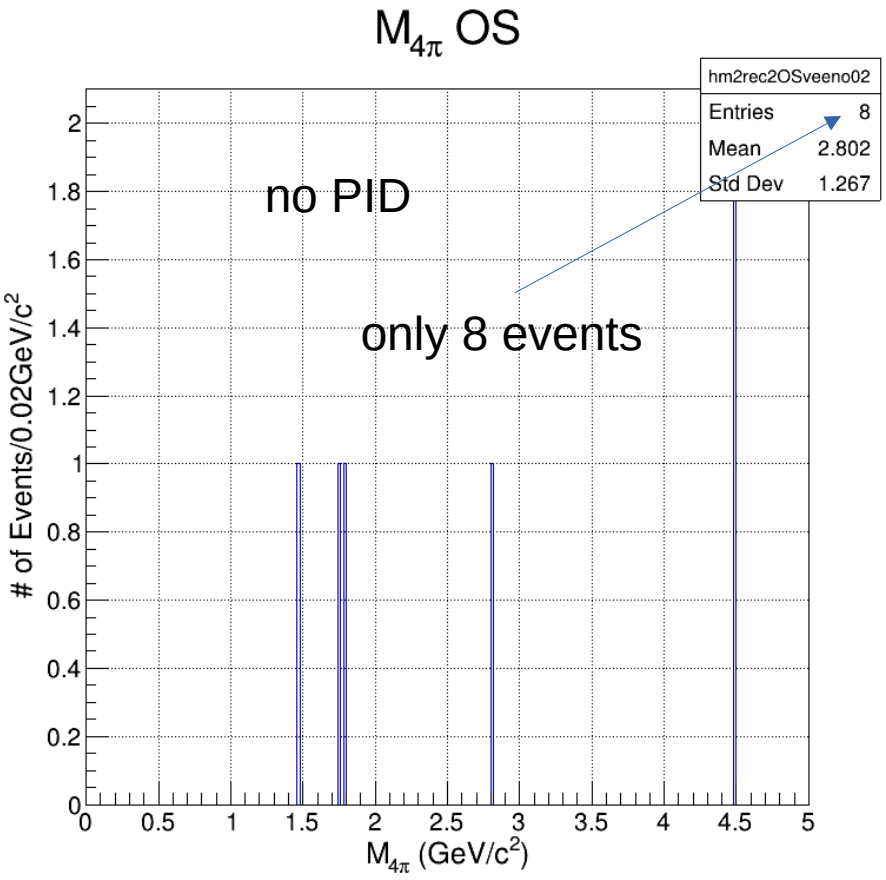
AN2017-268-v4



entries = tracks 4-track events
8188 entries = 2047 events
type:11 events 1 primary & 1 Vee negating Lambda events
dE/dx algorithm is rejecting many of the K0sK* events

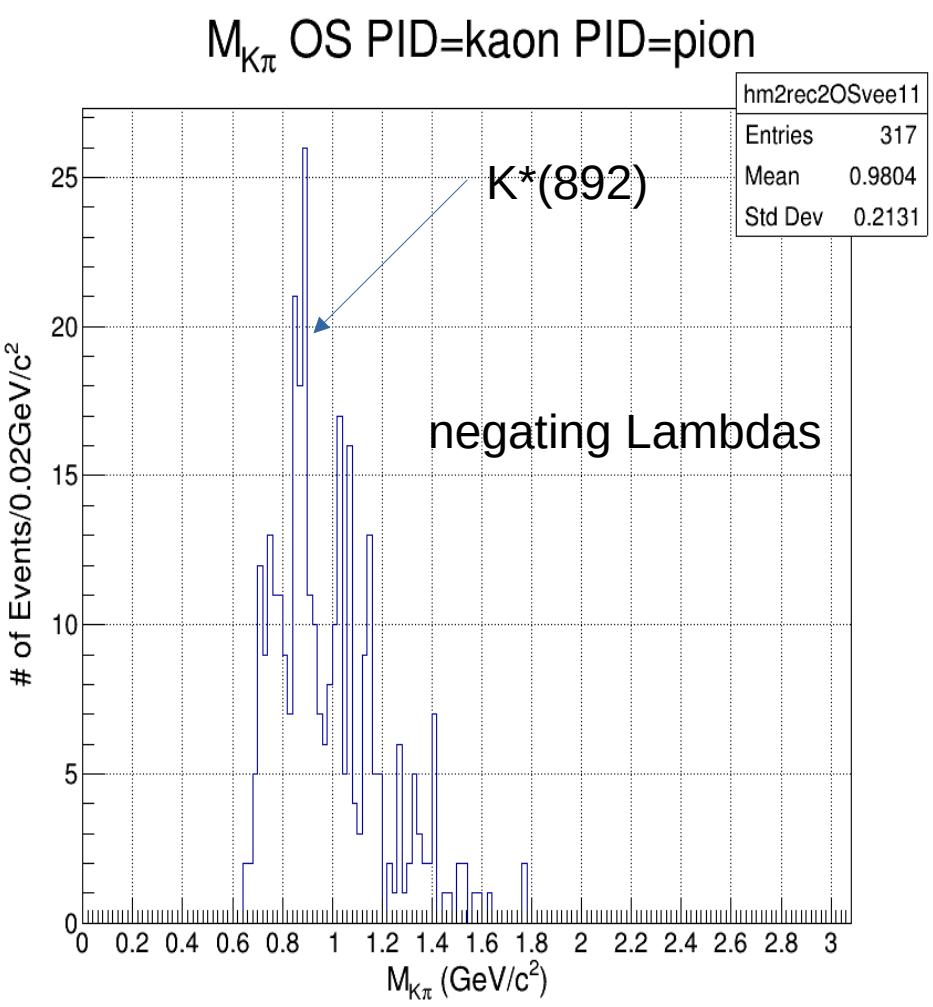
type:02 events – K0sK0s



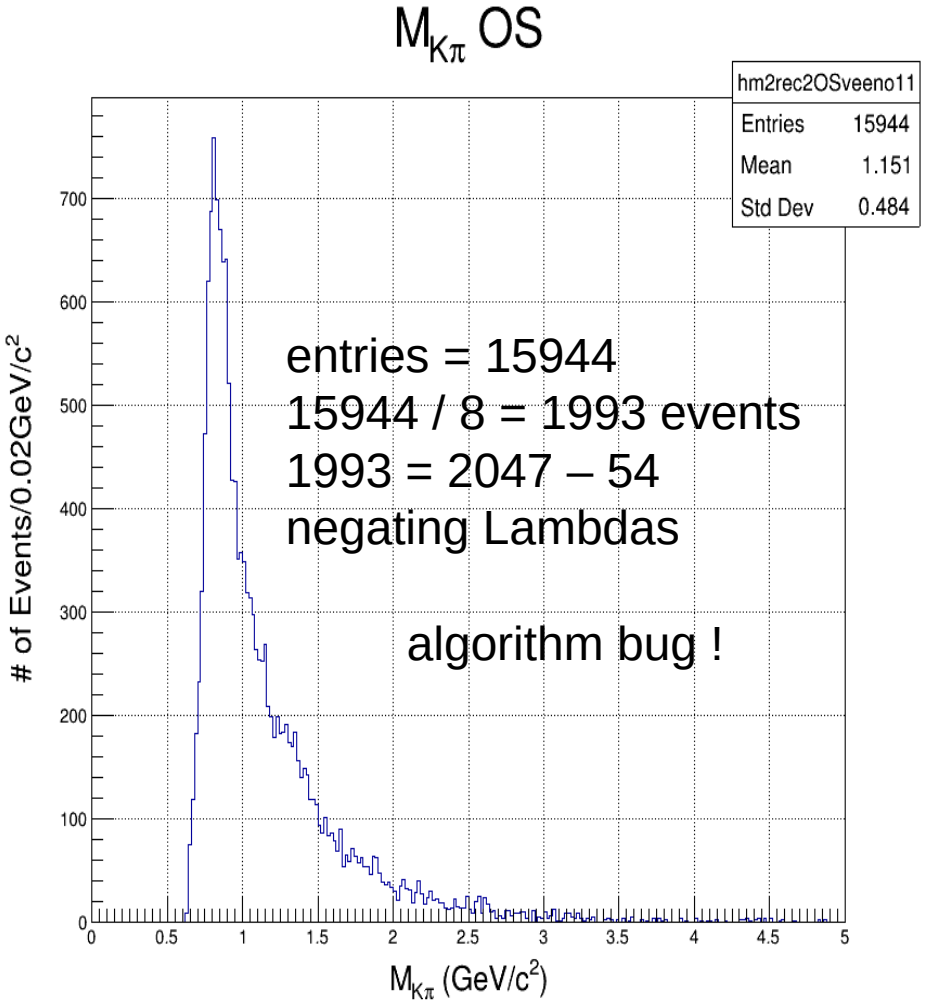


type:11 events – K0sK*

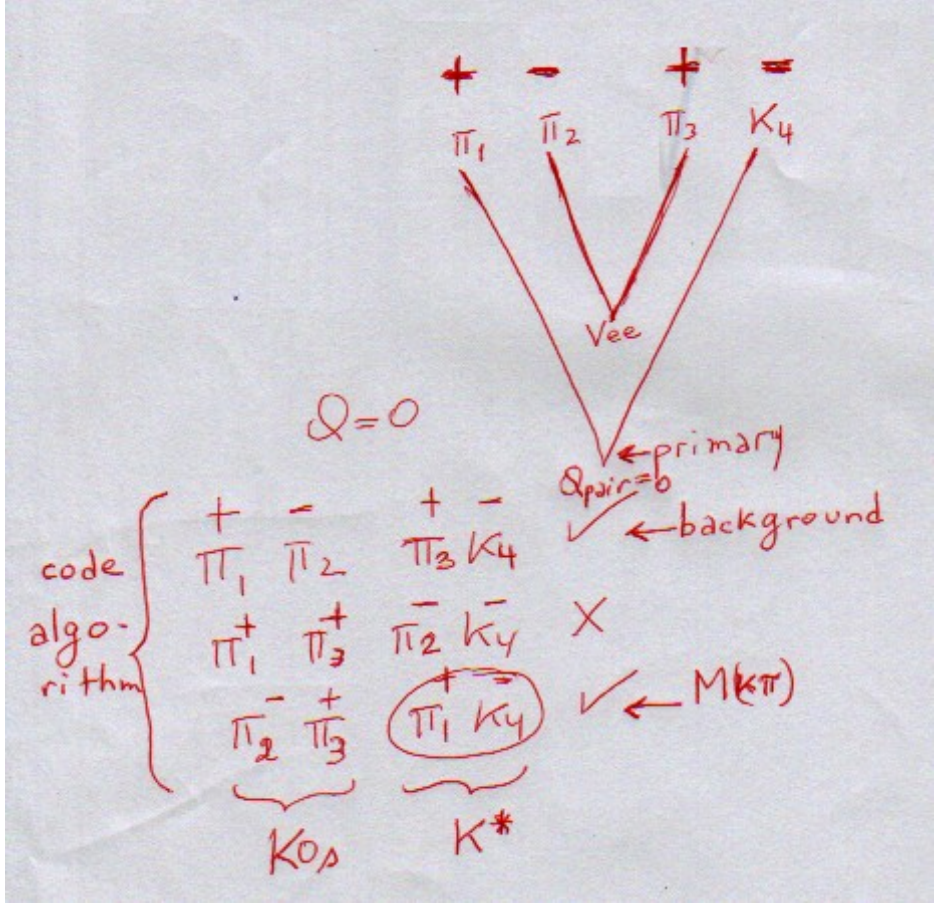
PID

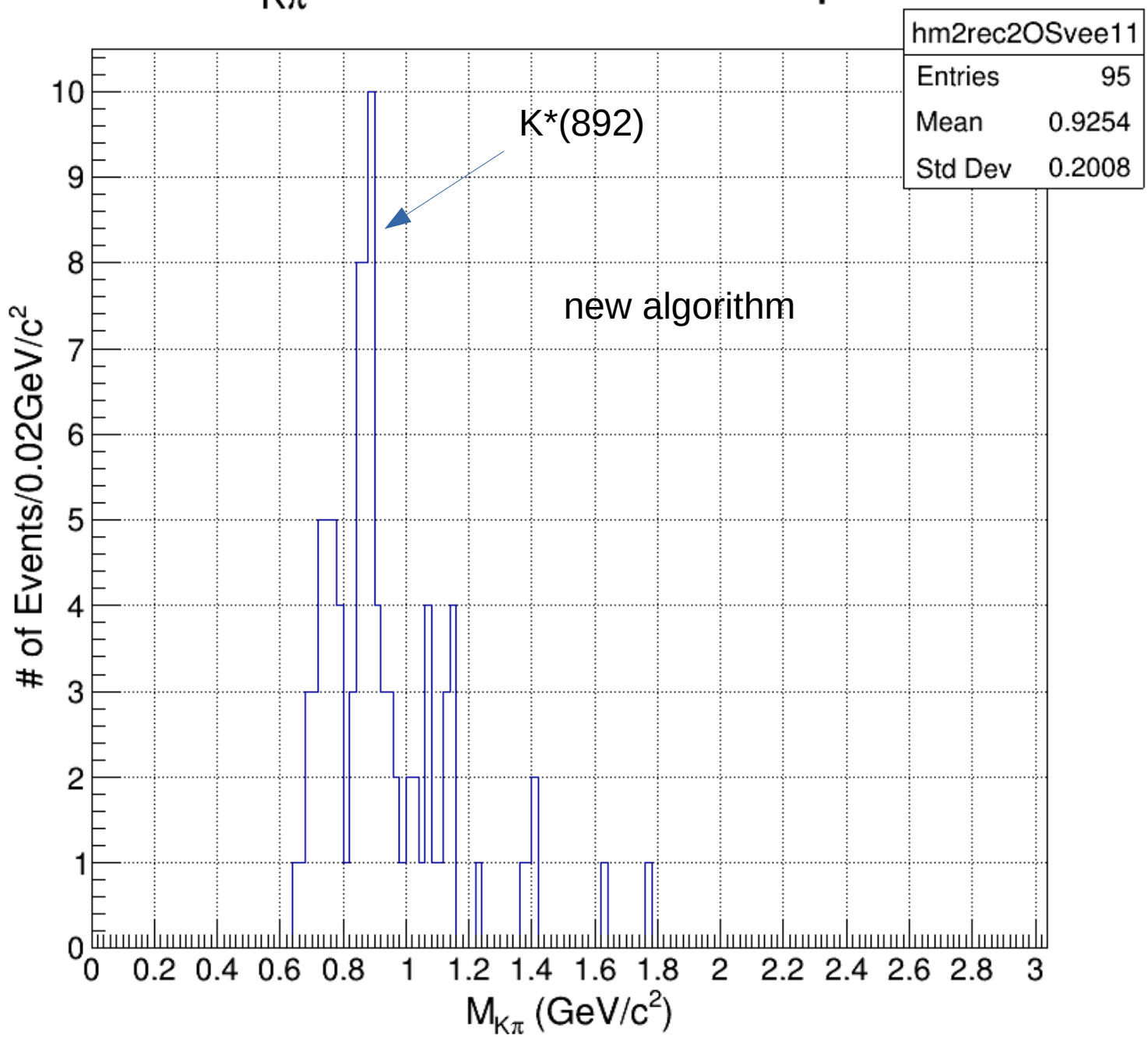


no PID



M(Kpi): a more explanatory diagram
checkmarks mean Qpair=0
pi3+k4- is junk
pi1+pi2- is junk
pi1+k4- is the primary vertex
pi2-pi3+ is the secondary vertex
where is the K?
pi1pi2 pi3k4
pi1pi2 k3pi4
pi1k2 pi3pi4
k1pi2 pi3pi4
1 = higher pt
How to tell the computer to make the right choice? which is pi1+k4-?
charge is not enough
PID is not enough
trying nesting the loops does not work.
solution: track information must be tagged to the vertex.
there are several parameters related to the vertex reconstruction.
CMS Twiki Vertex Reconstruction states that there are a few vertex tools.
I am trying to find a way to connect the tracks to the vertex, that is, relate the primary vertex to its tracks.
There are many parameters related to the vertices and tracks but with lack of information.




$M_{K\pi}$ OS PID=kaon PID=pion
hm2rec2OSvee11
Entries 95
Mean 0.9254
Std Dev 0.2008
K*(892)
new algorithm
# of Events/0.02GeV/c^2
$M_{K\pi}$ (GeV/c^2)
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
0 1 2 3 4 5 6 7 8 9 10

I can not find TOTEM 2018 data in the EOS repository.

Please, grant me access to it.

Kalman Filter for Vertexing – coming soon