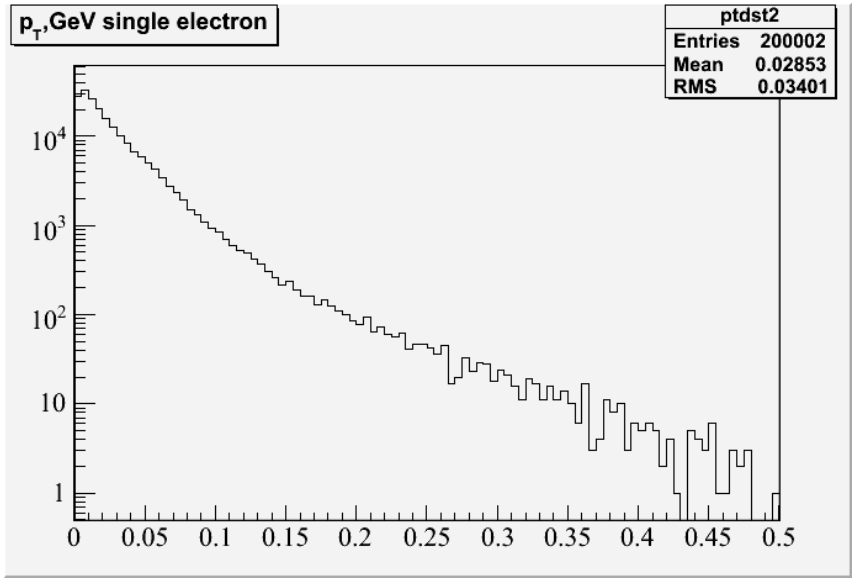
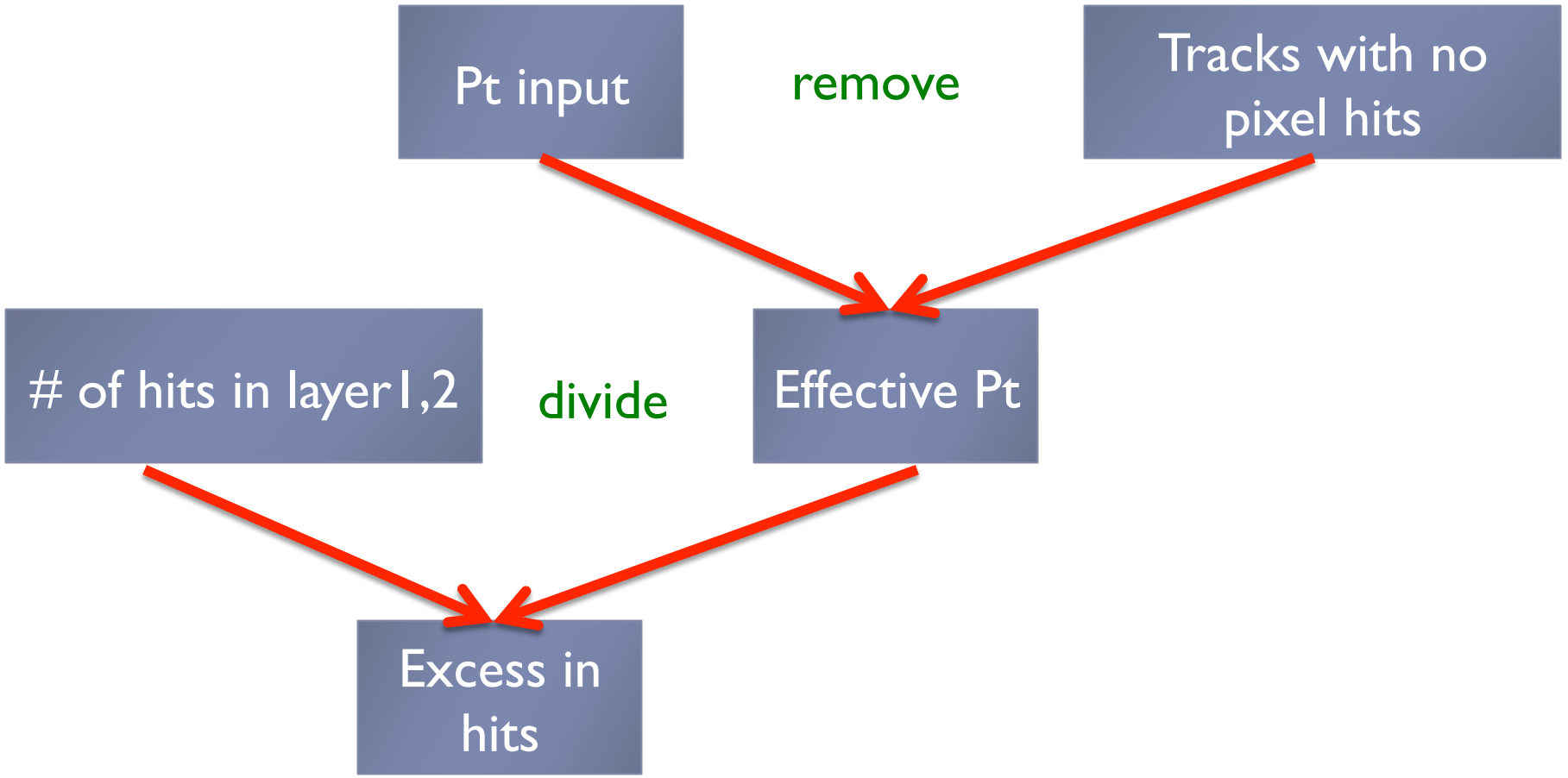
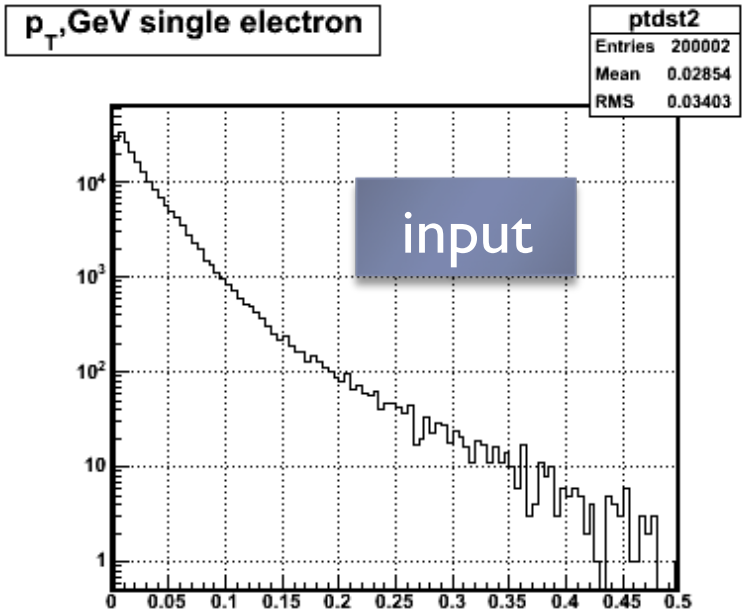
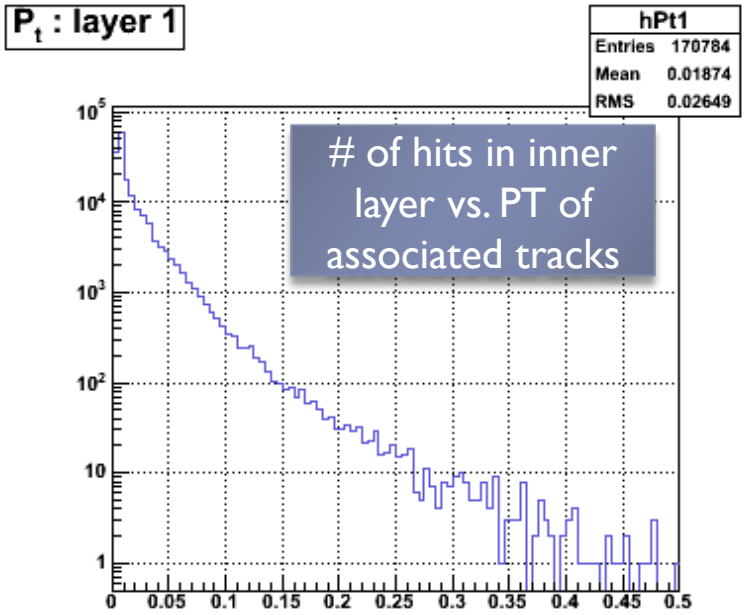
Single electrons UPC pileup

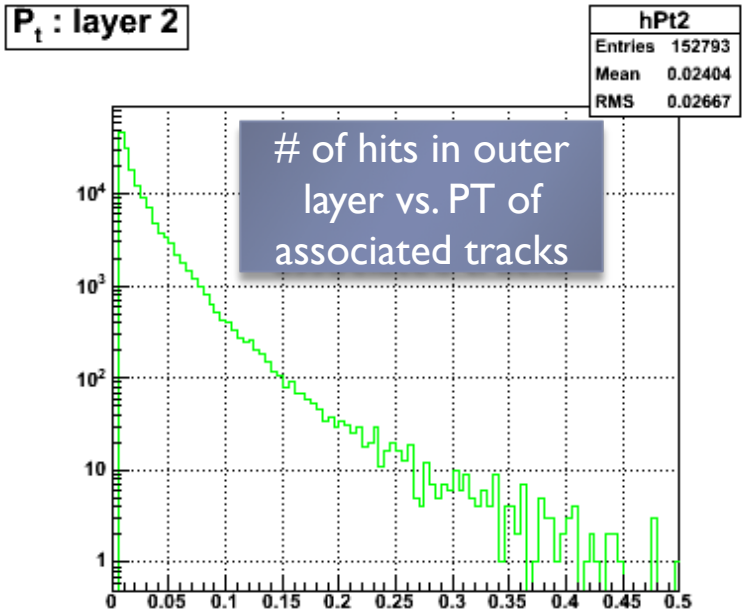
- Evaluation of the UPC electron contribution to the pileup.
- Input is the Pt of electrons in 0<Pt<0.5 from Y. Gorbunov.
- dump the number of bin ontent (= number of electrons) per bin in a .dat file.
- Use the .dat file as input for starsim (upgr15 geometry) where 1 electron / event is thrown (flat in |y|<1, σ_{Vz} = 20cm)

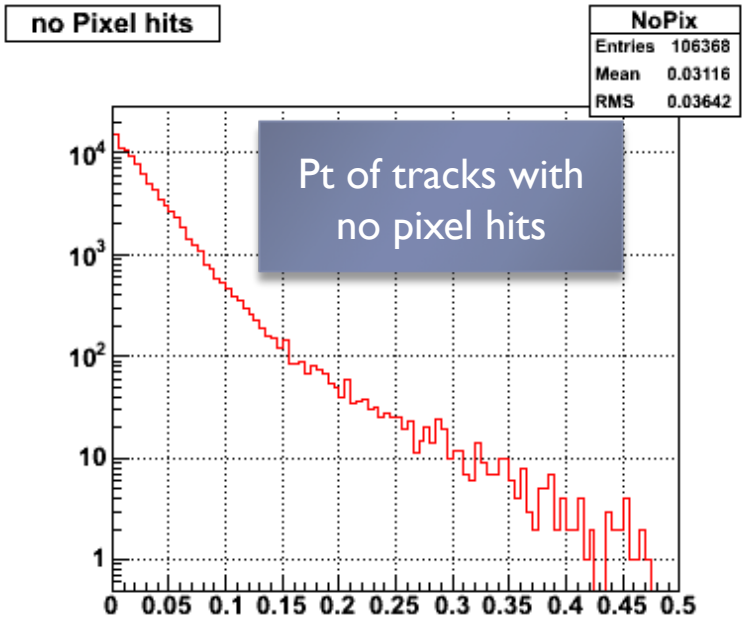


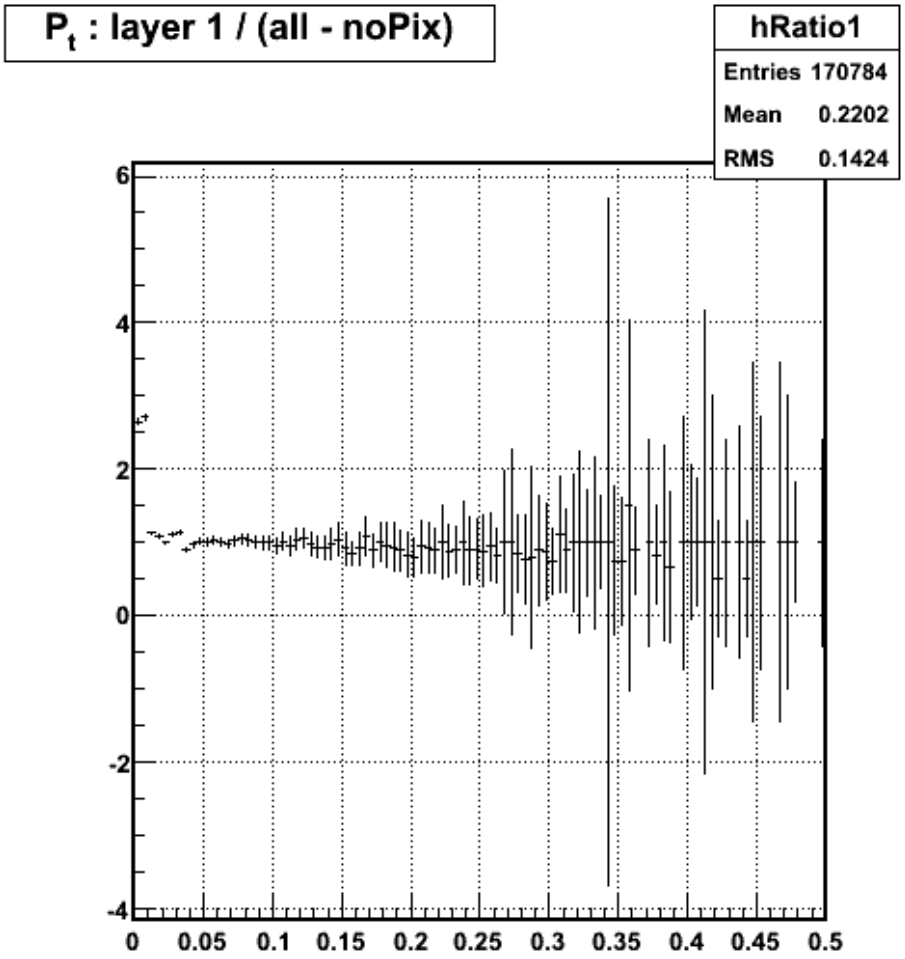

Pt input
remove
Tracks with no pixel hits
# of hits in layer1,2
divide
Effective Pt
Excess in hits

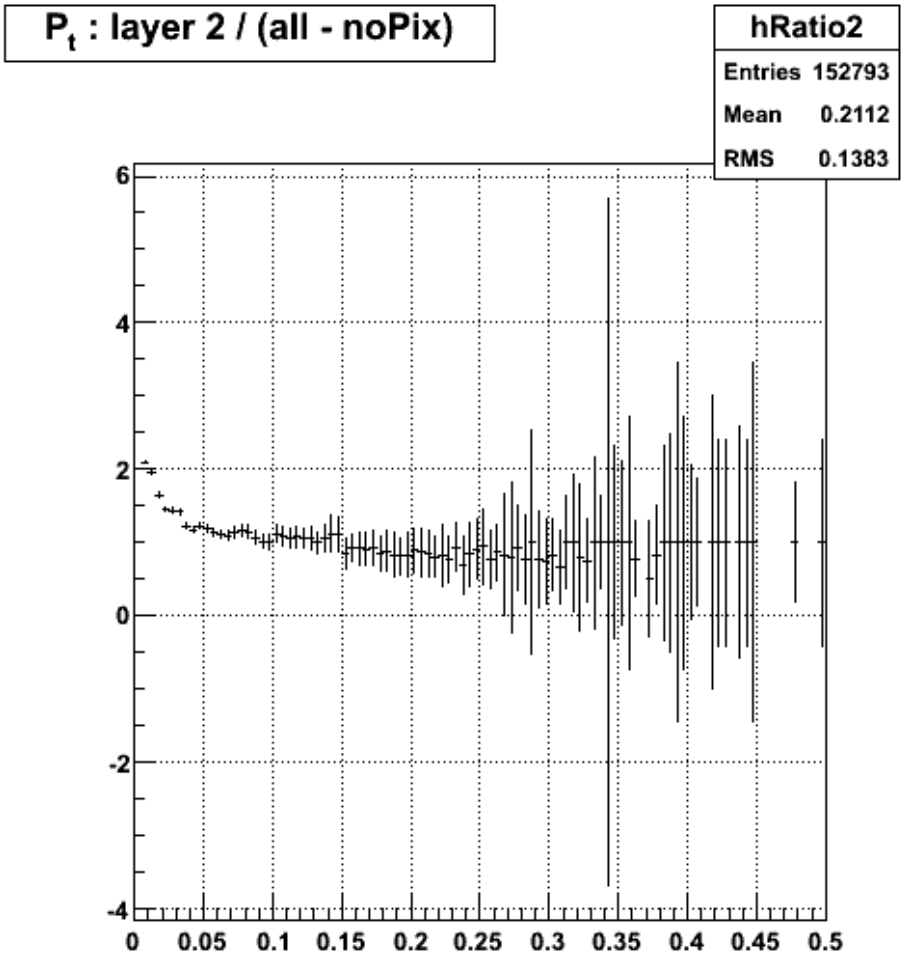

p_T,GeV single electron
ptdst2
Entries 200002
Mean 0.02854
RMS 0.03403
input


P_t : layer 1
hPt1
Entries 170784
Mean 0.01874
RMS 0.02649
# of hits in inner layer vs. PT of associated tracks


P_t : layer 2
hPt2
Entries 152793
Mean 0.02404
RMS 0.02667
# of hits in outer layer vs. PT of associated tracks


no Pixel hits
NoPix
Entries 106368
Mean 0.03116
RMS 0.03642
Pt of tracks with no pixel hits

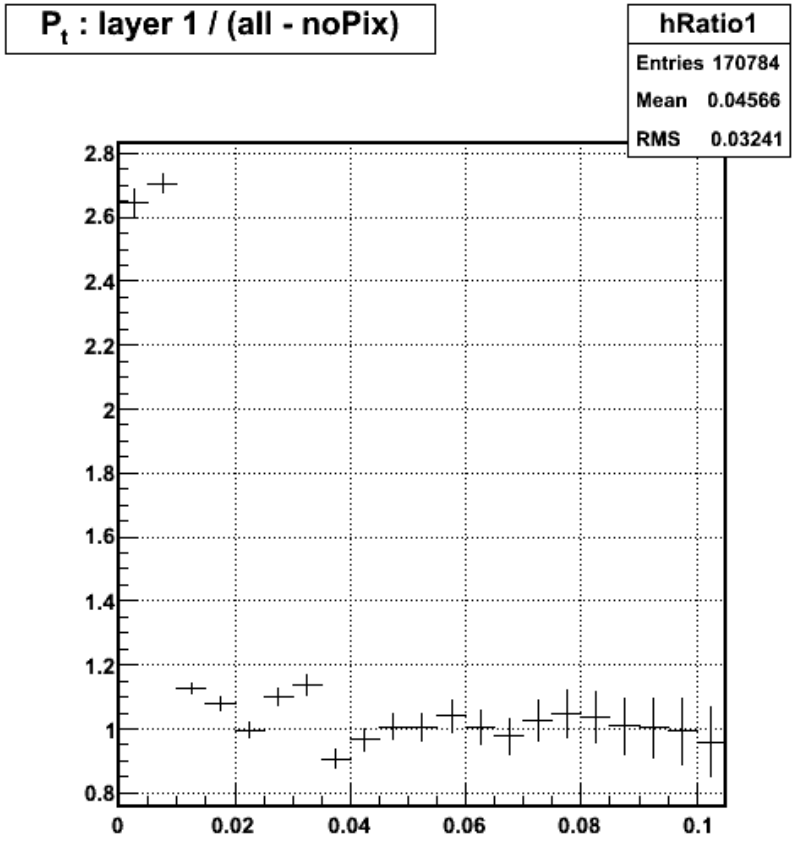

P_t : layer 1 / (all - noPix)
hRatio1
Entries 170784
Mean 0.2202
RMS 0.1424
6
4
2
0
-2
-4
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5

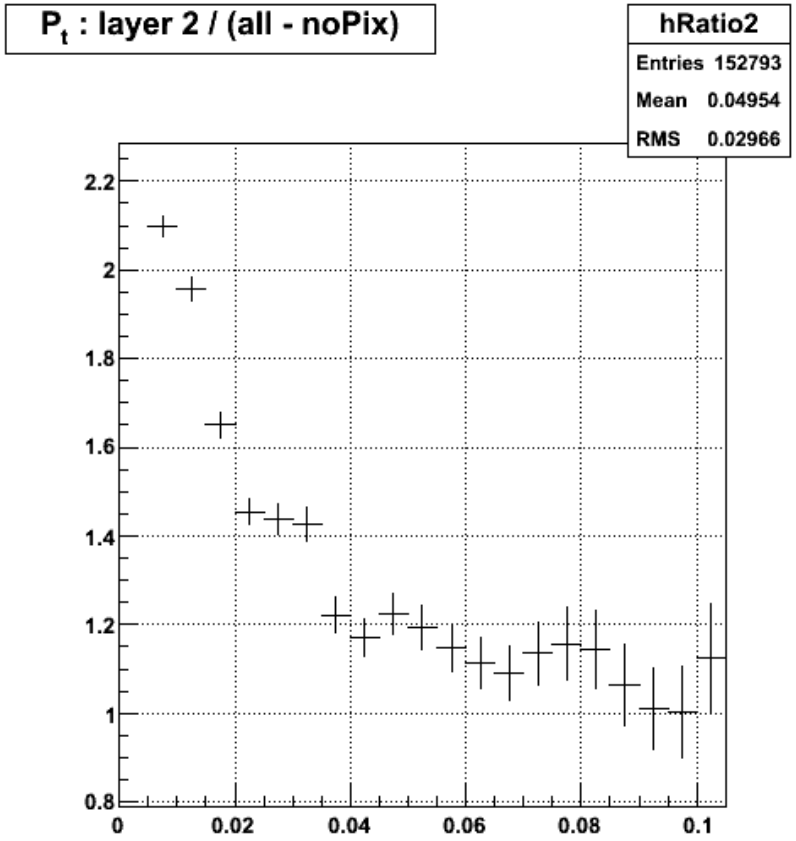
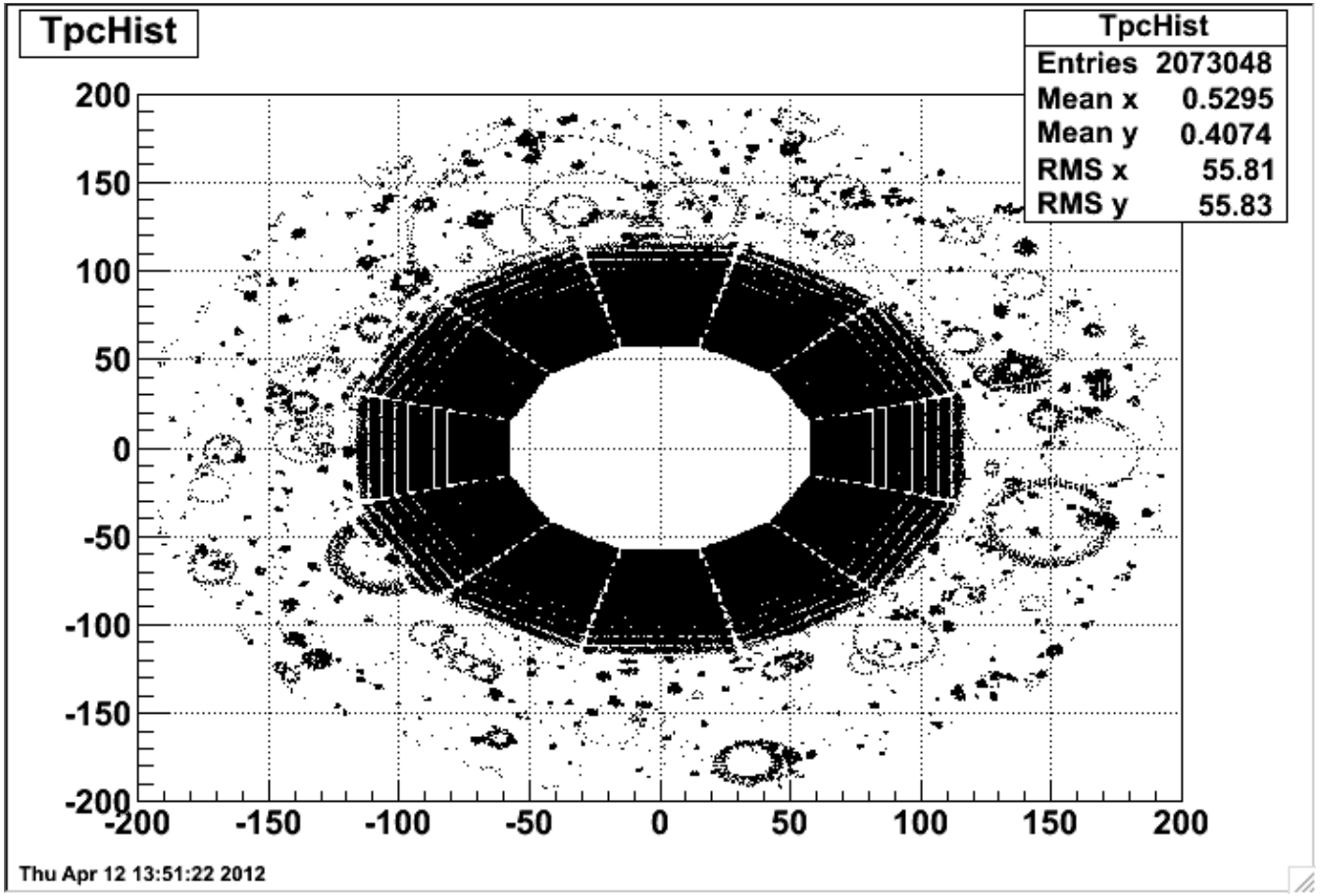

P_t : layer 2 / (all - noPix)
hRatio2
Entries 152793
Mean 0.2112
RMS 0.1383
6
4
2
0
-2
-4
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5

comments

- Contribution at very low Pt (<.1) of extra hits due to UPC electrons is not negligible
- For higher Pt, we found back a ratio ~1, meaning 1 track leaves 1 hit in each layer.
- To do : simulations with rapidity |y|<5 because even for vertex ~30cm, UPC electrons can hit the PXL detector.

Zoomed in 0 < Pt < 0.1





“Loopers” in TPC