pXp analysis

Luiz Emediato (Sao Paulo)
Tom McDowell, Cory Rude, Jane Nachtman (Iowa)
Mike Albrow (FNAL)

Overview

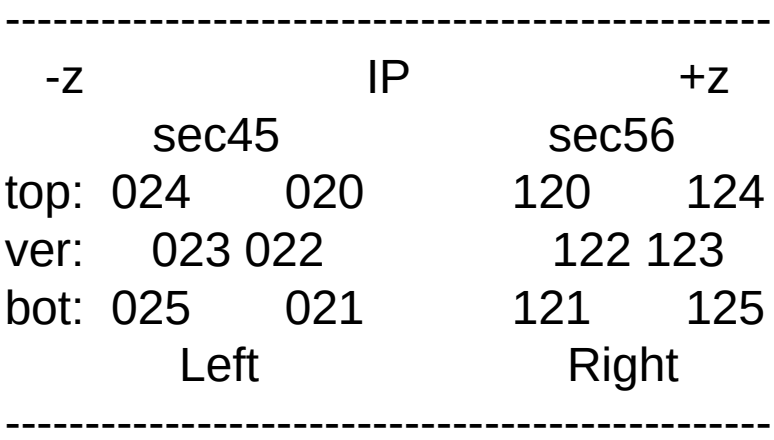
A) Central track plots:

1: Central (CMS) track multiplicity distribution (for events with the two protons).
2: Distributions for Q = + and Q = - separately of pT and eta and phi.
We expect that +ve and -ve tracks have identical distributions but good to check.

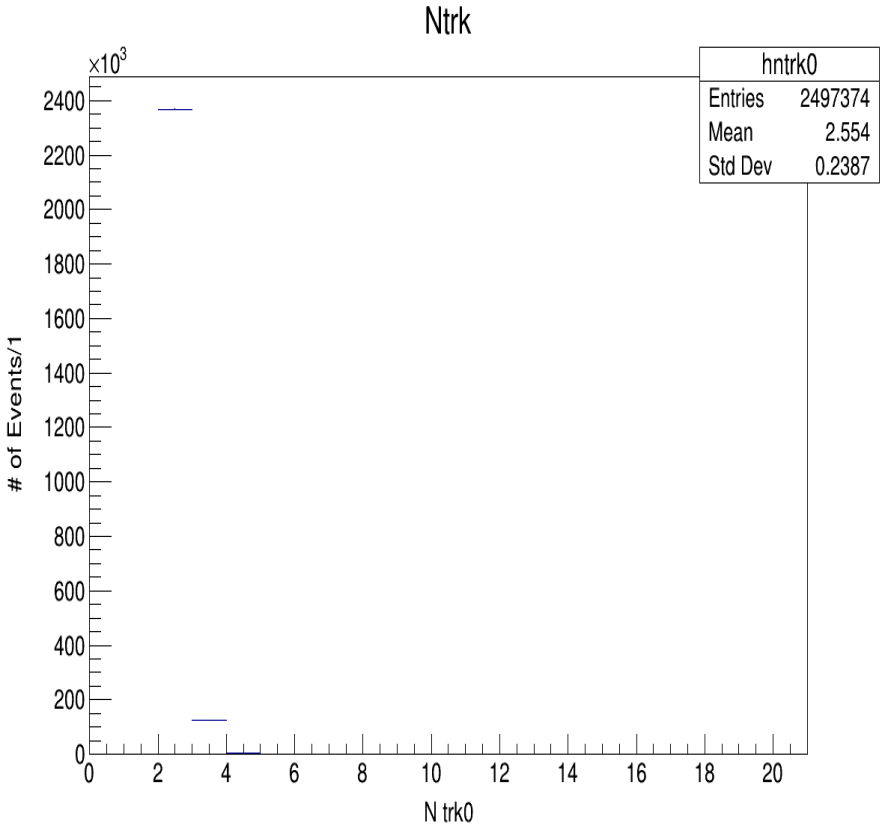
B) Combined CMS+TOTEM plots

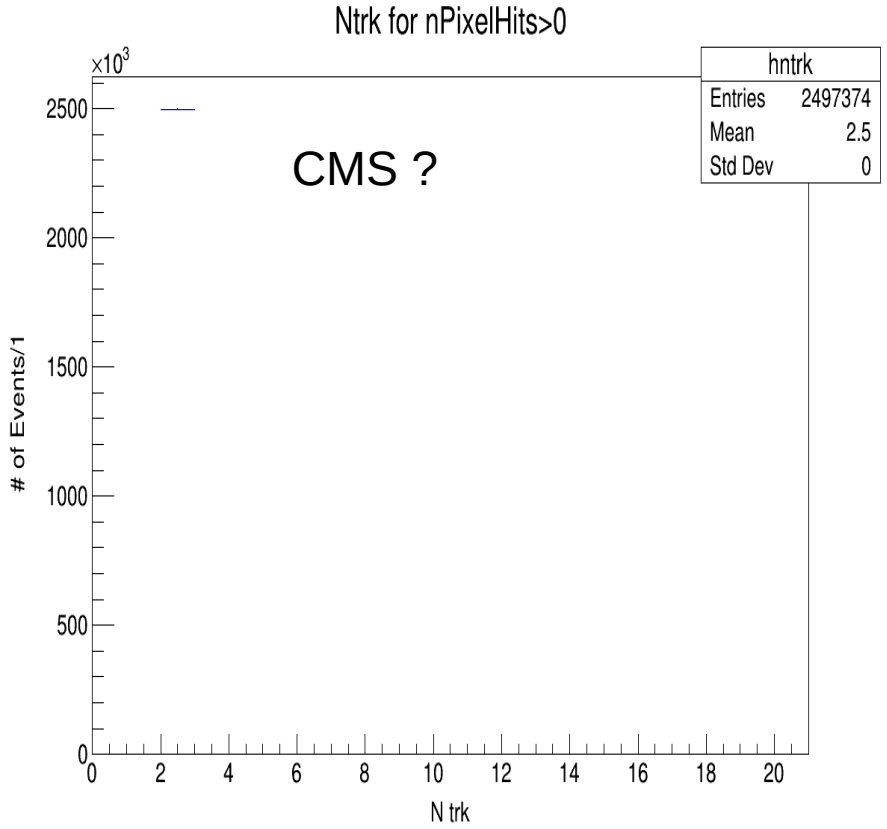
C) Acceptance phi vs |t|

TOTEM’s RP map

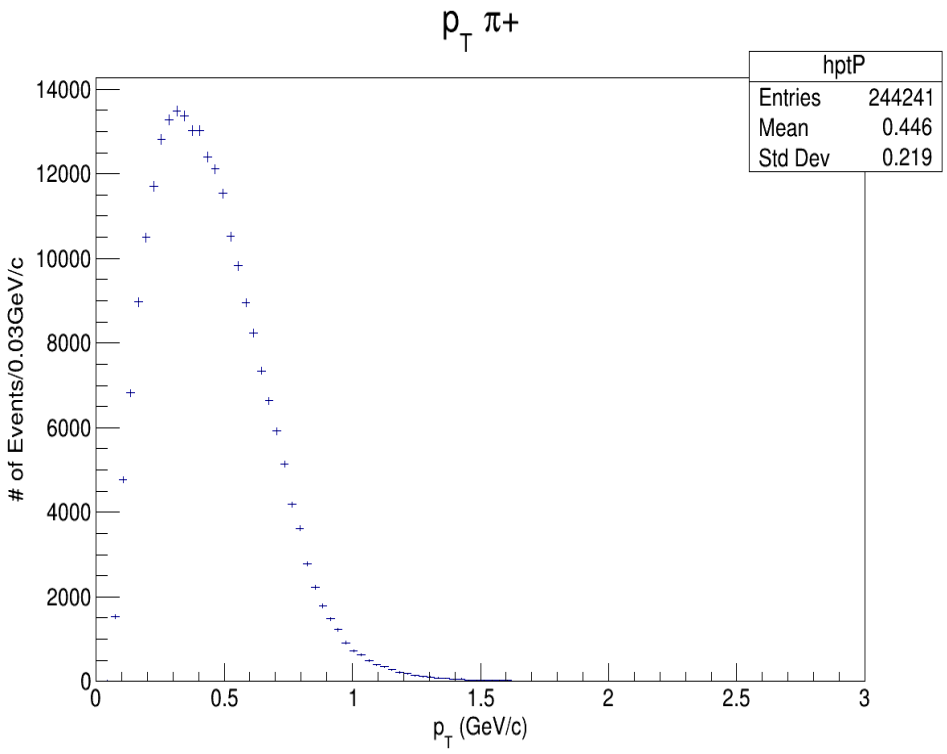


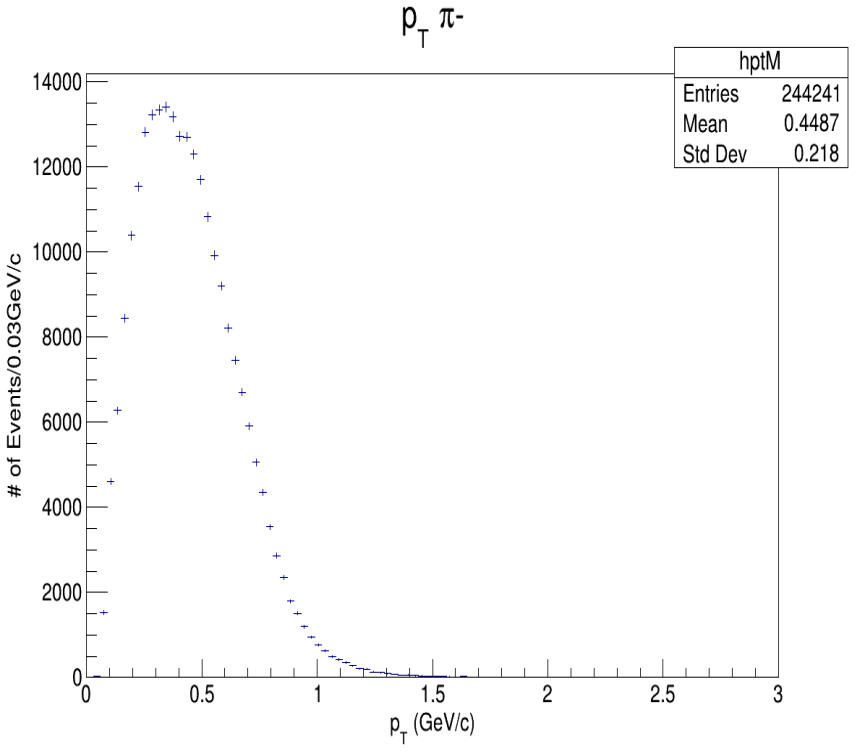
Multiplicity – 2-track events (reduced2) – all 2015 data – except run#9998





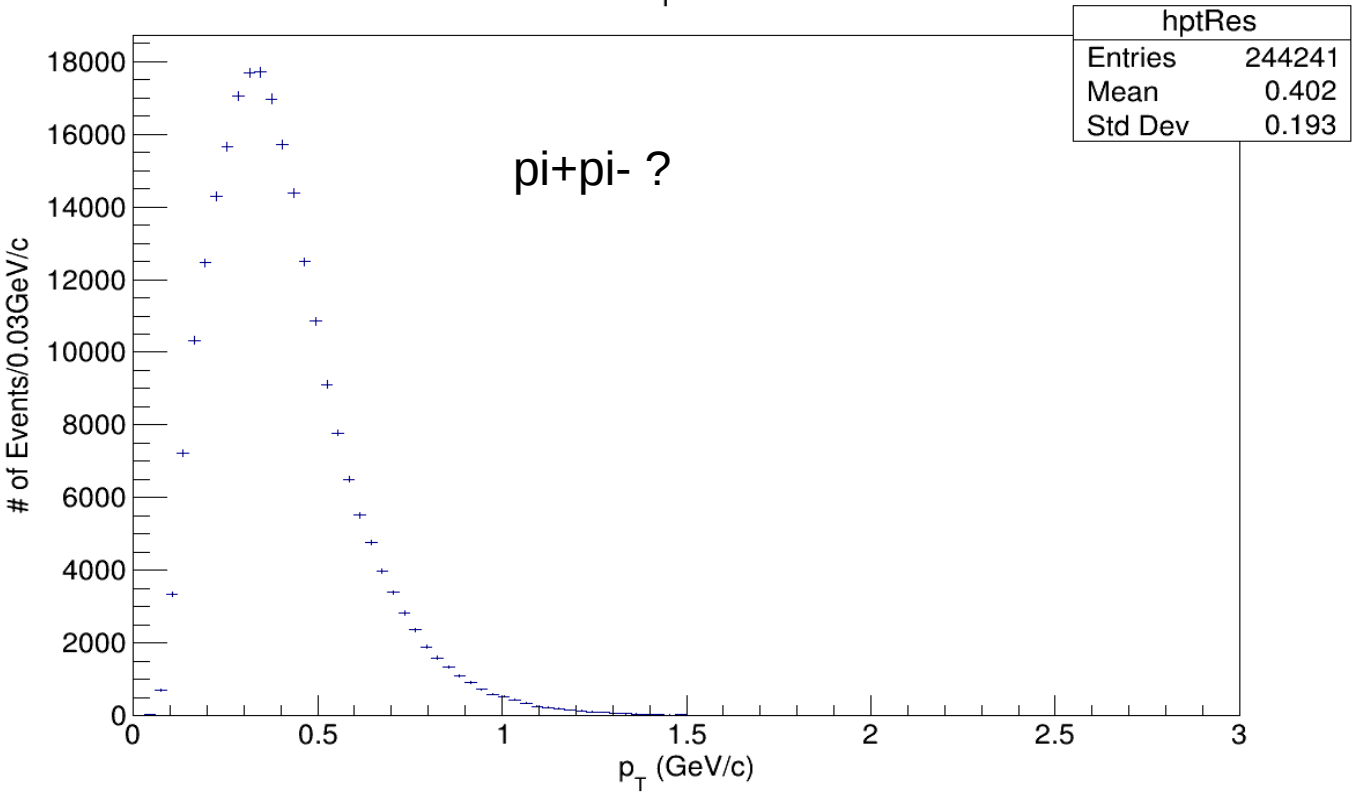
2-track events - except run#9998



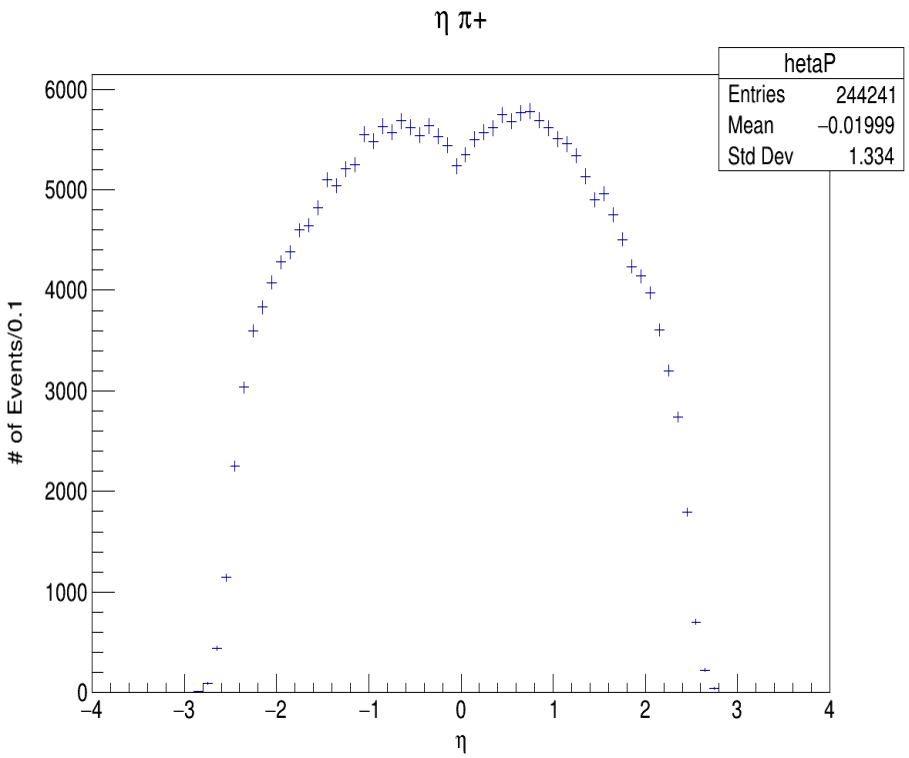


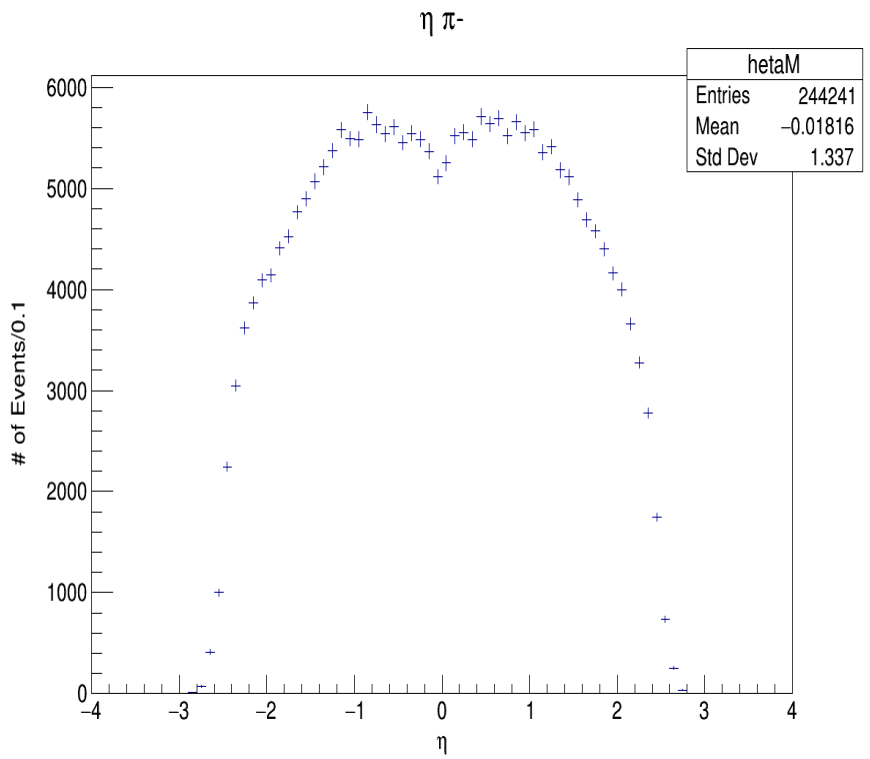
2-track events

p_T ππ



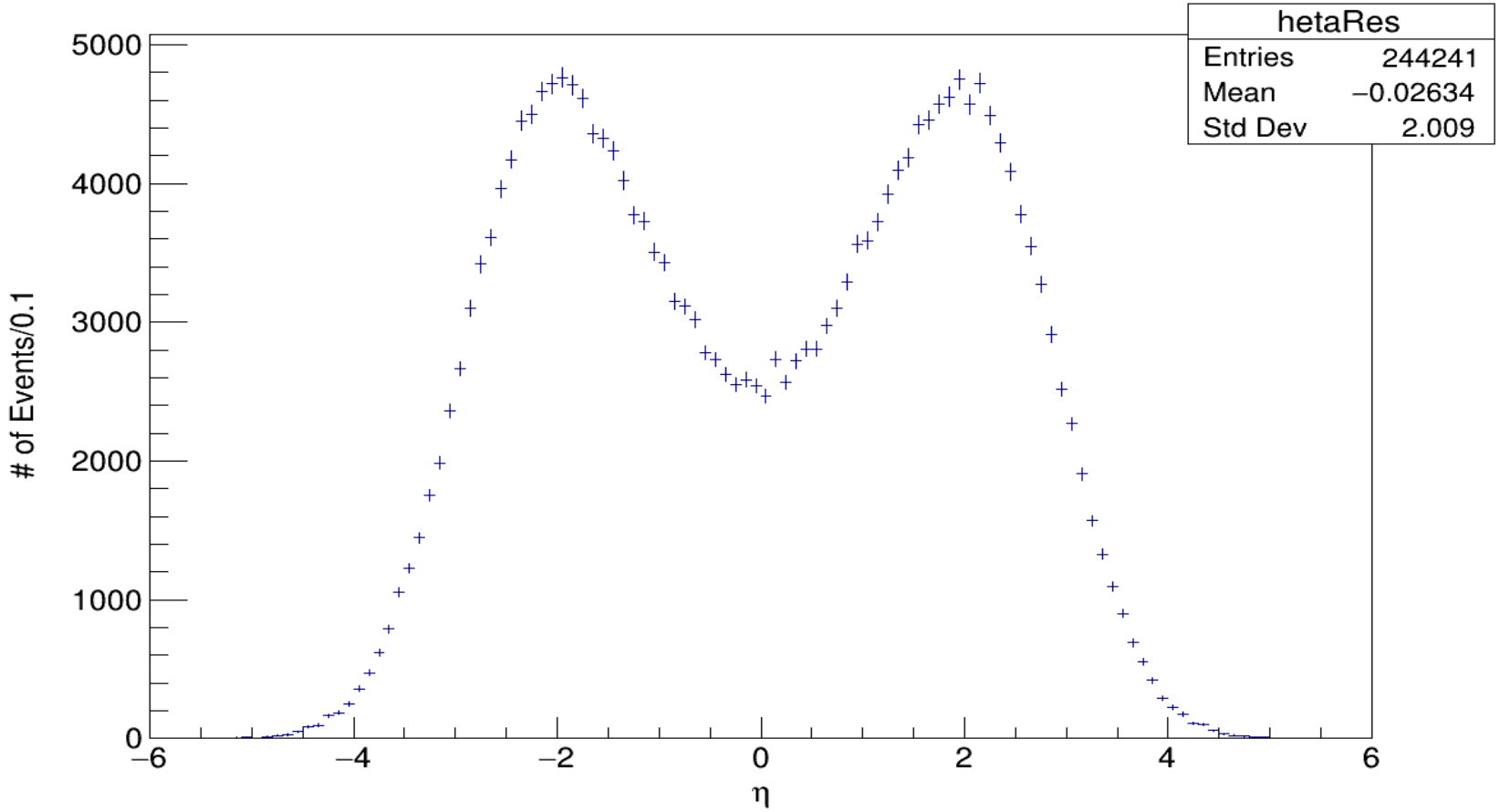
2-track events



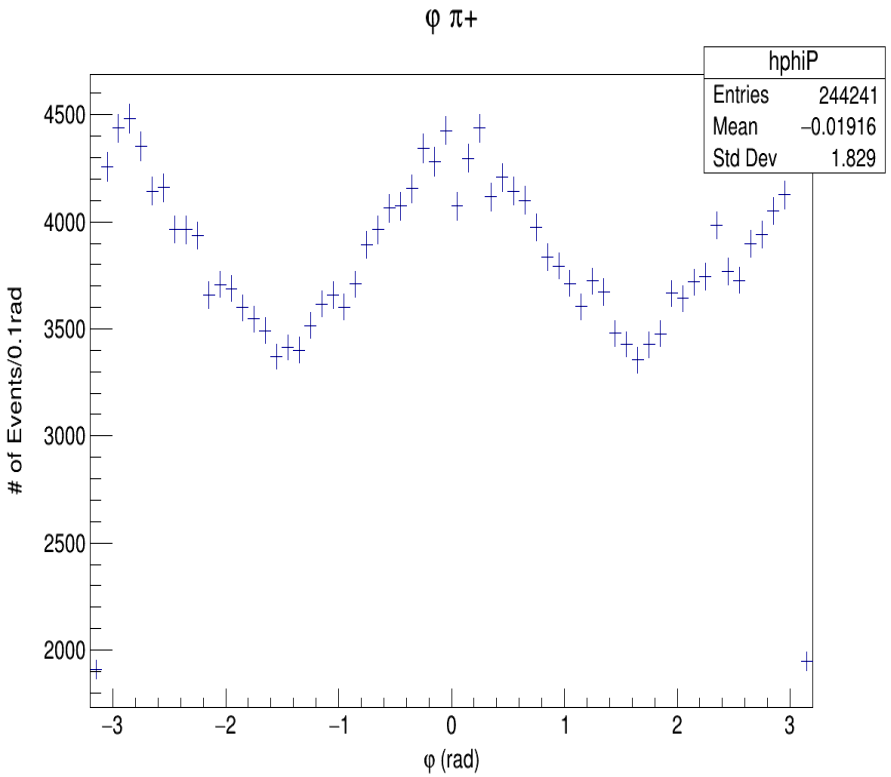


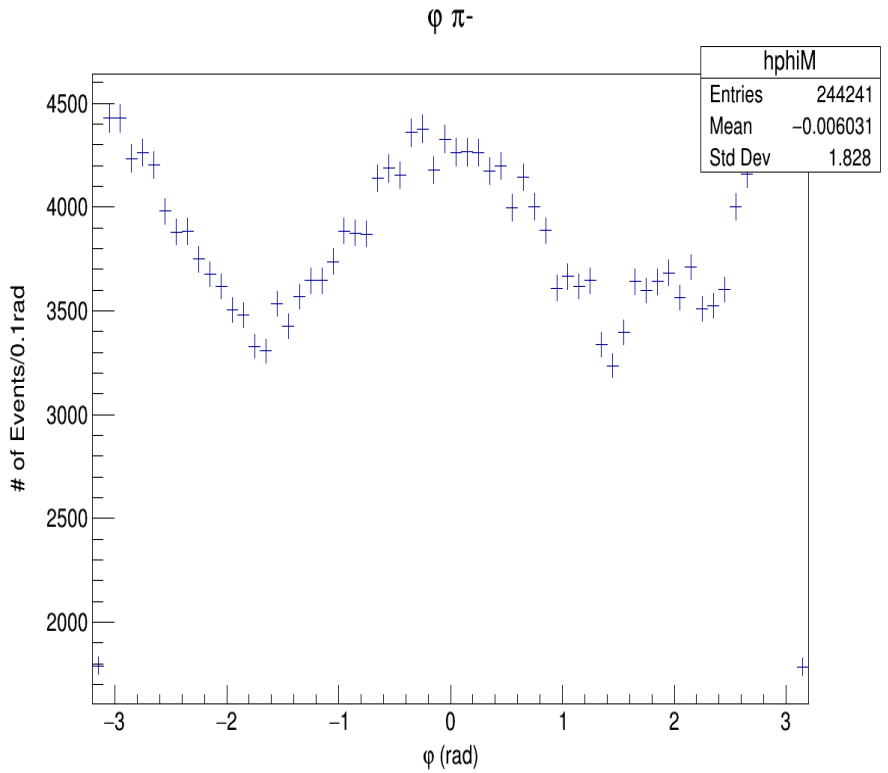
2-track events

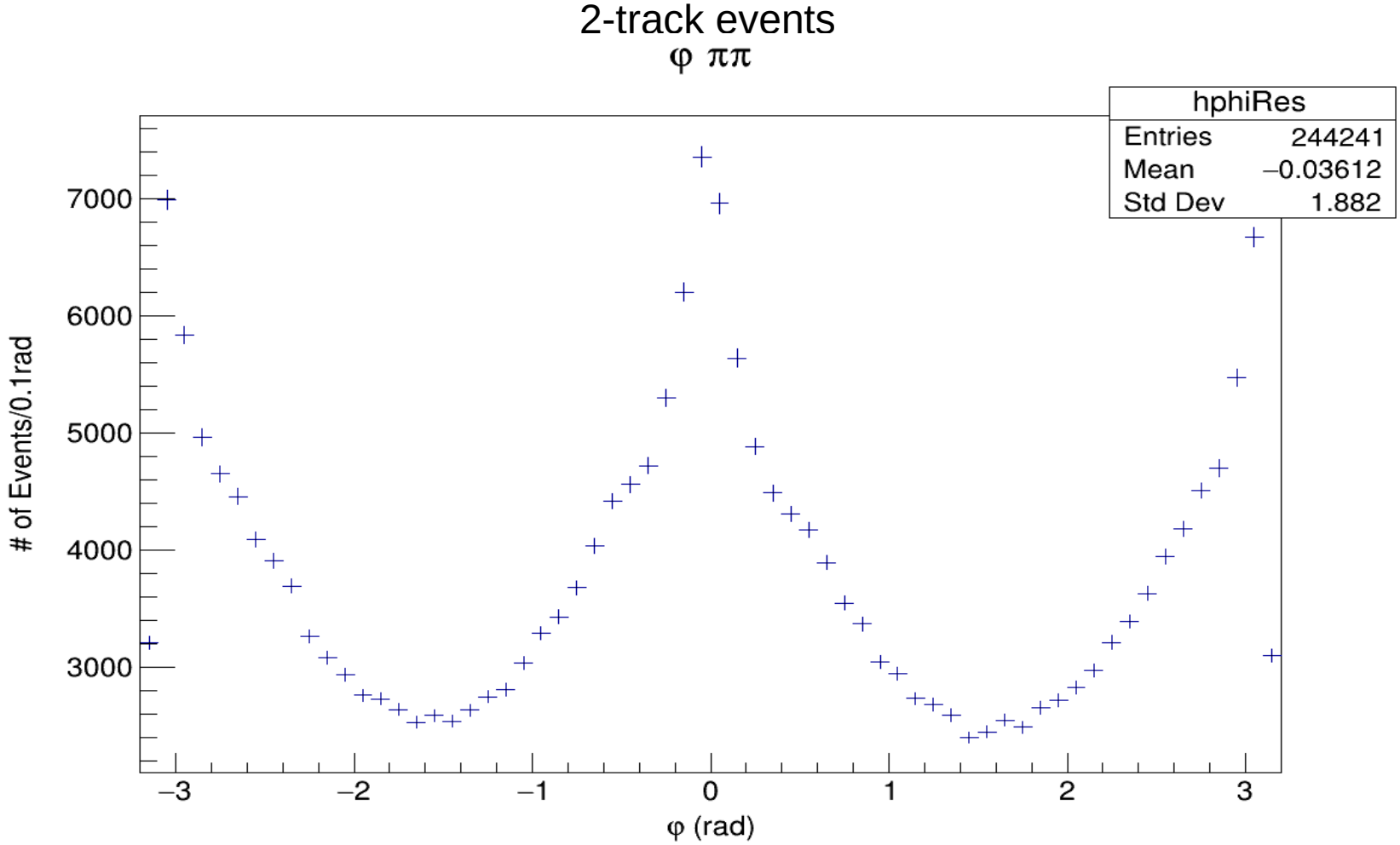
$\eta \pi\pi$



2-track events






2-track events
φ ππ
hphiRes
Entries 244241
Mean −0.03612
Std Dev 1.882
# of Events/0.1rad
7000
6000
5000
4000
3000
−3
−2
−1
0
1
2
3
φ (rad)

coming up...

Combined CMS+TOTEM plots

Balance in transverse momenta like Delta pX and Delta py. You showed one and I think that means px and py balance, but really it is the SUM of the four tracks pX and py (keeping signs) that should equal 0 for balanced events. We may still have a different coordinate system in CMS and TOTEM, beware!

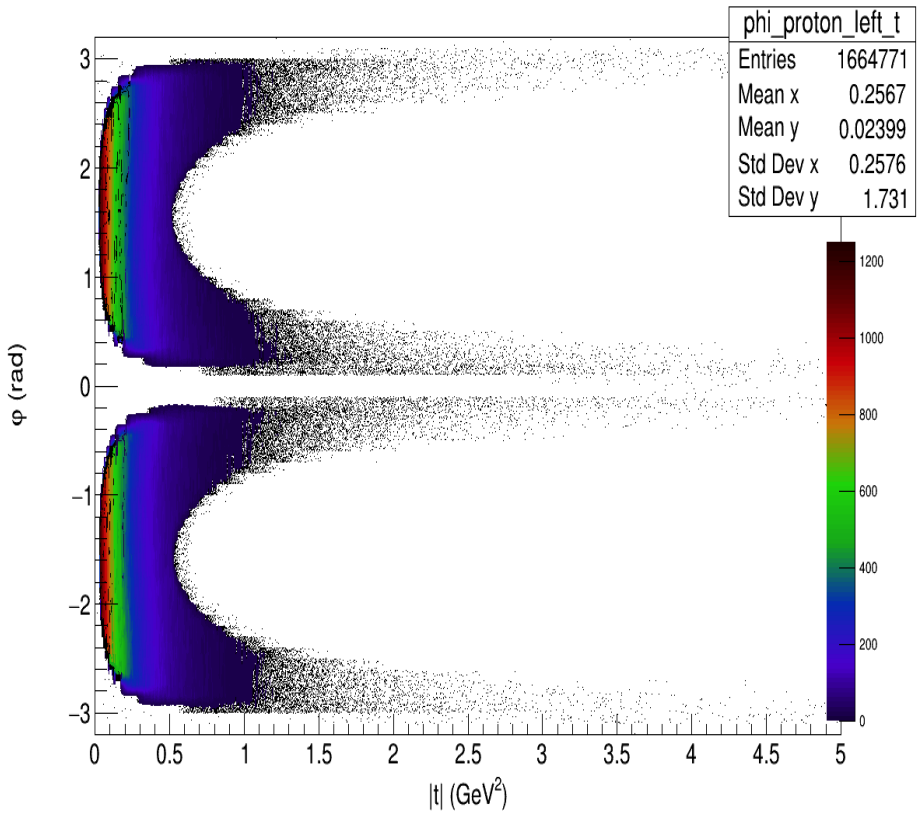
Anyway the plot you showed of Delta px CMS-TOTEM TT/BB peaks at 0 and that must mean balance, and a selection of -0.2 GeV/c to + 0.2 GeV/c (I suppose) will keep nearly all the good balanced events and just remove a few that may have missing or badly measured tracks. **Do same thing for py balance.**

Note: For a plot of a quantity like that – having seen it I think a histogram (rather than points with statistical error bars) would be better, choosing a bin size like 0.01 or 0.005 GeV/c if the statistics allows it to look smooth.

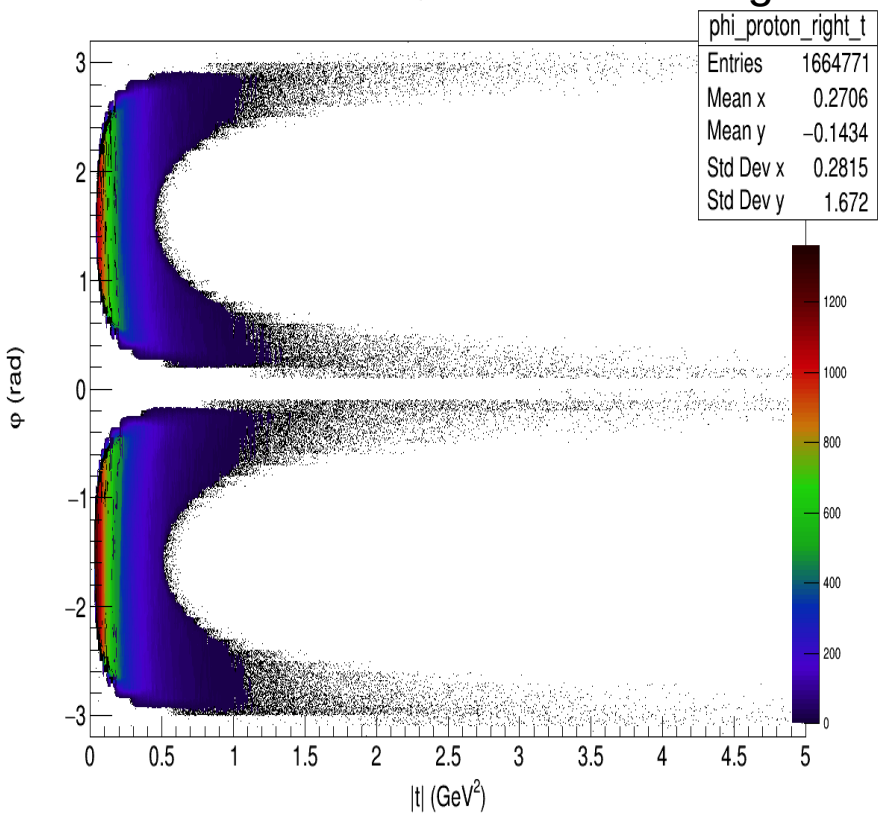
Acceptance A(t,phi)

protons run #4510

Left



Right



Thank you