

pXp analysis

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Overview

1. 4-track code: `luianaRP4.cc` (github)
 - important: **make -f LUMakefile4** to compile the code
 - for now 4 pions (4 kaons, 4 muons, 4 electrons) per event only
 - 4-track data
2. Hand notes: `luianaRP-scheme.pdf` (140MB google drive only)
 - helps to understand the logic.
 - not in github, it allows only 25MB/file
 - “pula” is the portuguese for skip or jump
 - if you want to print the code in syntax-oriented colors use emacs:
C-u M(ESC)-x ps-print-buffer-with-faces
 - for2 loop: tracks per event
 - for3 loop: vertices per event

- main loops:
 - loop over data files
 - loop over events
 - sub loop over tracks
 - sub loop over vertices

3. number of vertices nvtx : now 1 or 2 (originally 1)

4. my plot (sent yesterday) pyTOTEM vs pyCMS is wrong! I found the culprit.

5. cuts:

a- fiducialRegion: 4 tracks, each pion $\eta < \eta_{\text{Cut}}=2.5$

b- fiducialRegionPt: 4 tracks, each pion $p_t > p_{t\text{Cut}}=0.2\text{GeV}/c$

$$CT_{px\text{cut}} = | CMS_{px} + TOTEM_{px} | < 0.15$$

$$CT_{py\text{cut}} = | CMS_{py} + TOTEM_{py} | < 0.06$$

$$RP_{\text{vertex}} = | x_{VtxL} - x_{VtxR} | < 3e-5$$

$$CT_{\text{vertex}} = -0.04 < (x_{vtx} - x_{vtxT} \cdot 100) \text{ .AND. } (x_{vtx} - x_{vtxT} \cdot 100) < 0.18$$

- cut 1: a, b \rightarrow hm2rec

a, b, $Q=0 \rightarrow$ hm2recOS (hm4recOS)

a, b, $Q \neq 0 \rightarrow$ hm2recSS

- cut 2: a, b, $Q=0$, RPvertex, $CT_{px\text{cut}}$, $CT_{\text{vertex}} \rightarrow$ hm2rec2OS (hm4rec2OS)

a, b, $Q \neq 0$, RPvertex, $CT_{px\text{cut}}$, $CT_{\text{vertex}} \rightarrow$ hm2rec2SS

need to be fixed

- cut 3: a, b, $Q=0$, RPvertex, CTpxcut \rightarrow hm2rec3OS (hm4rec3OS)
a, b, $Q \neq 0$, RPvertex, CTpxcut \rightarrow hm2rec3SS
need to be fixed

- cut 4: a, b, $Q=0$, RPvertex, CTpxcut, CTvertex, $|z_{vtx}| < 5.0$ \rightarrow hm4rec4OS
a, b, $Q \neq 0$, RPvertex, CTpxcut, CTvertex, $|z_{vtx}| < 5.0$ \rightarrow hm4rec4SS
need to be fixed

- cut 5: a, b, $Q=0$, Rpvertex, CTvertex \rightarrow hm4rec5OS
a, b, $Q \neq 0$, RPvertex, CTvertex \rightarrow hm4rec5SS
need to be fixed

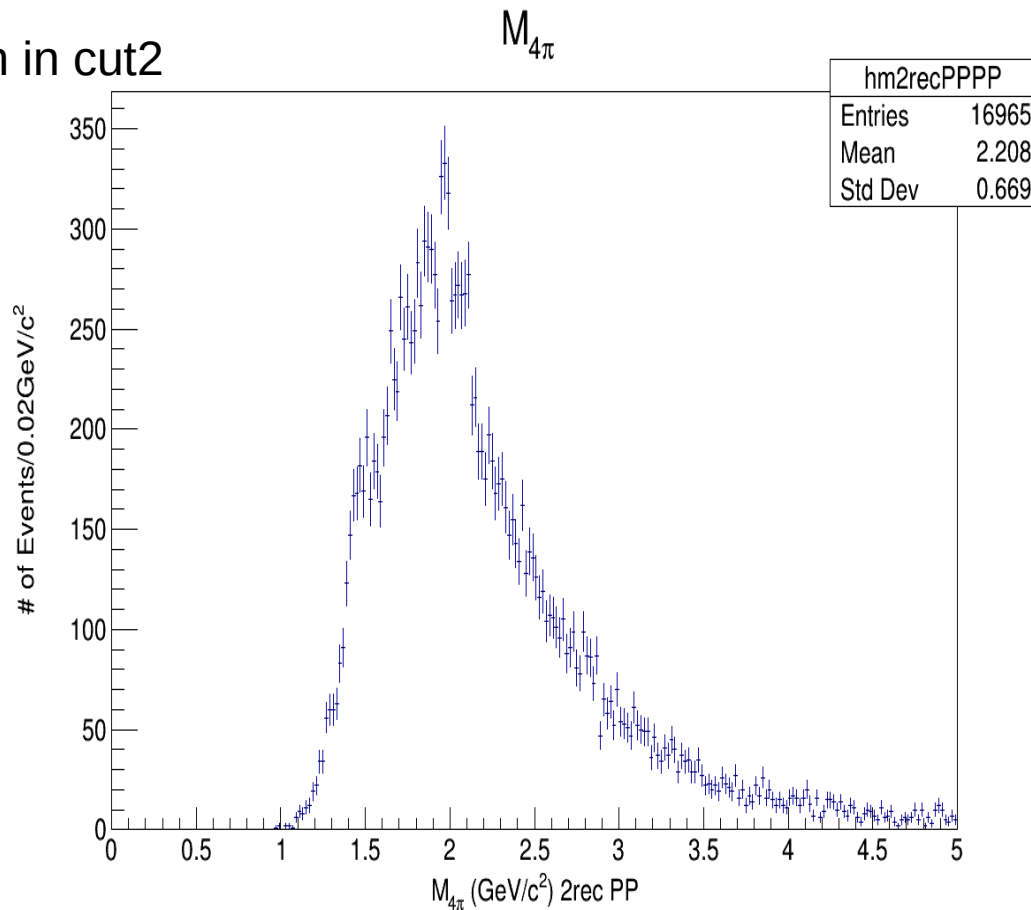
- cut 6: a, b, $Q=0$, RPvertex, CTpxcut, CTvertex, etaCut2
each pion $|\eta| < \text{etaCut2}=1.5 \rightarrow$ hm4rec6OS
a, b, $Q \neq 0$, RPvertex, CTpxcut, CTvertex, etaCut2
each pion $|\eta| < \text{etaCut2}=1.5 \rightarrow$ hm4rec6SS
need to be fixed

- cut 7: a, b, $Q=0$, diag, RPvertex, CTpxcut \rightarrow hm4recHFvetoOS
a, b, $Q \neq 0$, diag, RPvertex, CTpxcut \rightarrow hm4recHFvetoOS
need to be fixed

This is a 4 pion mass distribution in cut2

wrong! plot...sorry

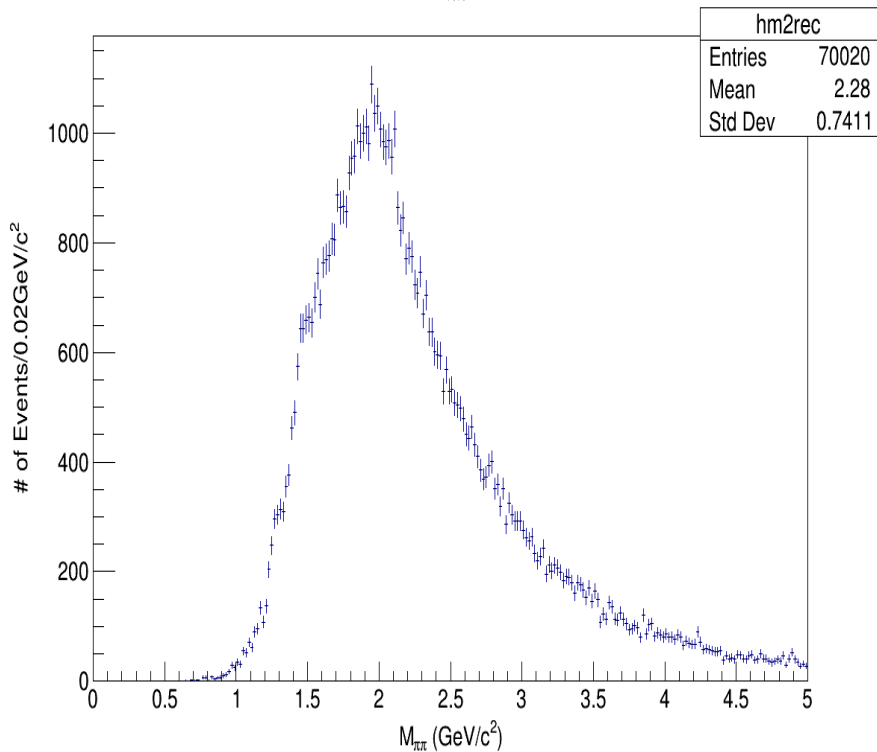
I did not fix CTpxcut for 4 pions



M 4 pions (wrong titles...sorry)

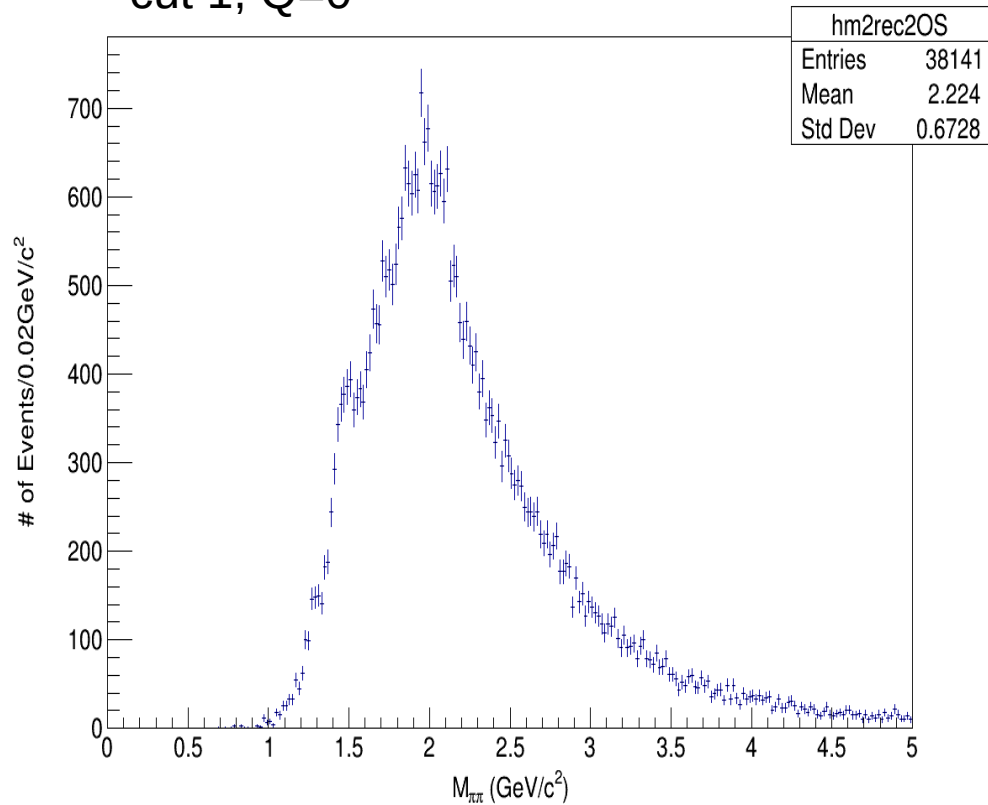
cut 1

$M_{\pi\pi}$



cut 1, Q=0

$M_{\pi\pi}$ OS



Question: What does it mean, Simone, in the code ?

GRANIITTI is working on my Fedora 29

Thanks for the attention !