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CSCTF: News

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- Firmware and PTLUTs changes

Firmware and PTLUTs possible changes

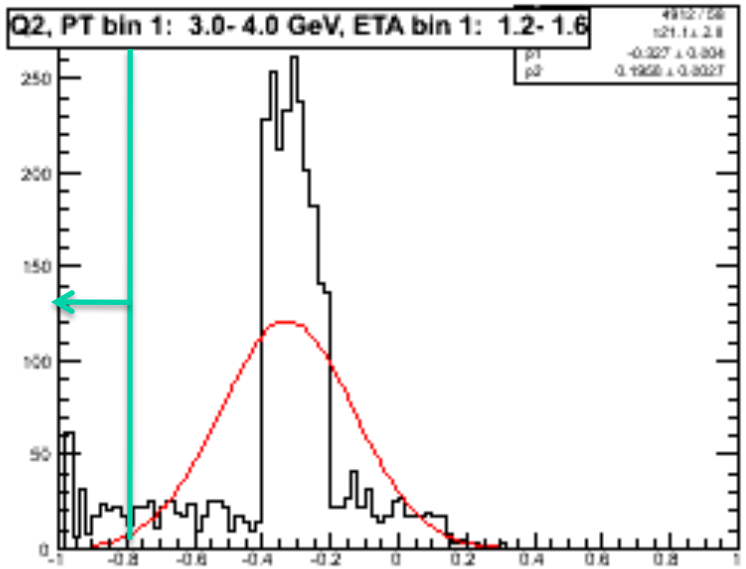
1. Firmware changing: make non-linear Δϕ12 and Δϕ23 for 3 station tracks without DT stubs
2. PTLUTs changing:
   - max Likelihood
   - non-linear Δϕ12 and Δϕ23 for 3 station tracks without DT stubs

? 3. add Δη info to 2 station tracks with ME1 (without DT) -> see back up slides
now we have Δϕ23 – 4 bits -> CLCT patter
CLCT pattern needs 1 bit: if(CLCT = 8, 91, 10) -> 1
otherwise -> 0
we have 3 bits for Δη -> eta window could be up to 7 (1 unit = 0.0125)
we even could roll back eta window cut to 6 (now 4 -> 0.05)

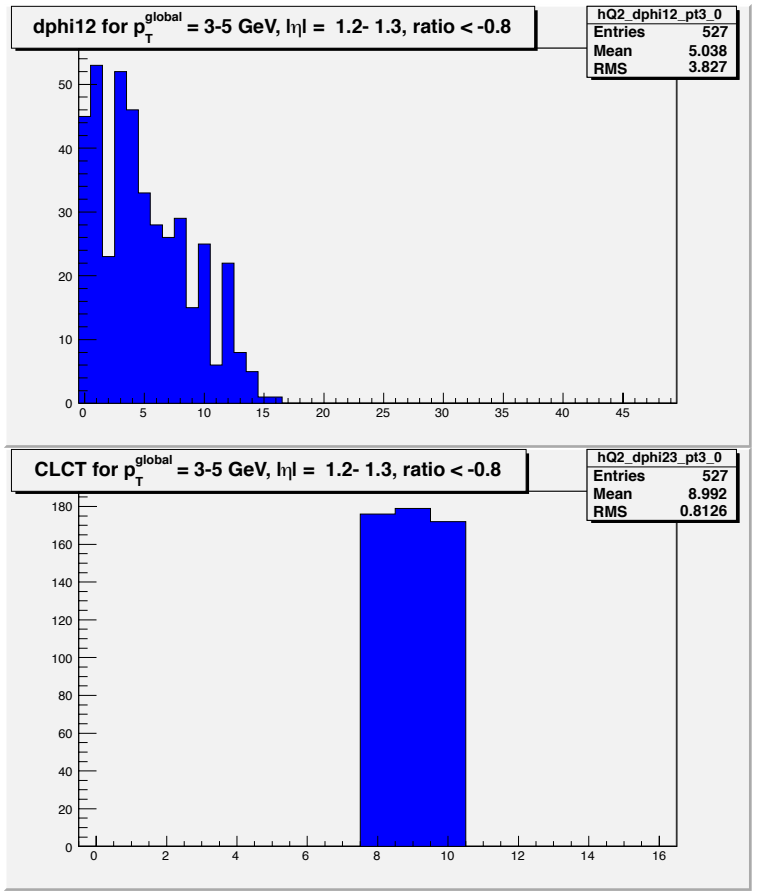
?4. for |η| > 2.1 are we going to change firmware to fine min Δη (3 links)?

Back up

Resolution: Quality_CSCTF_tight = 2



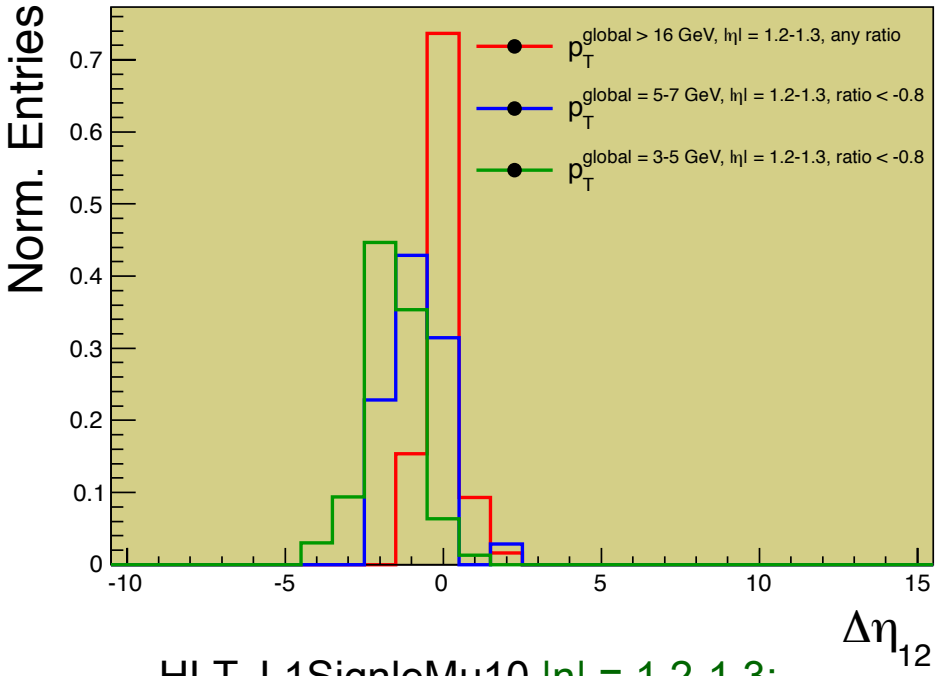
- let's look at the tails ratio < -0.8
  for reco p_T = 3-4 GeV (CSCTF p_T > 15 GeV):

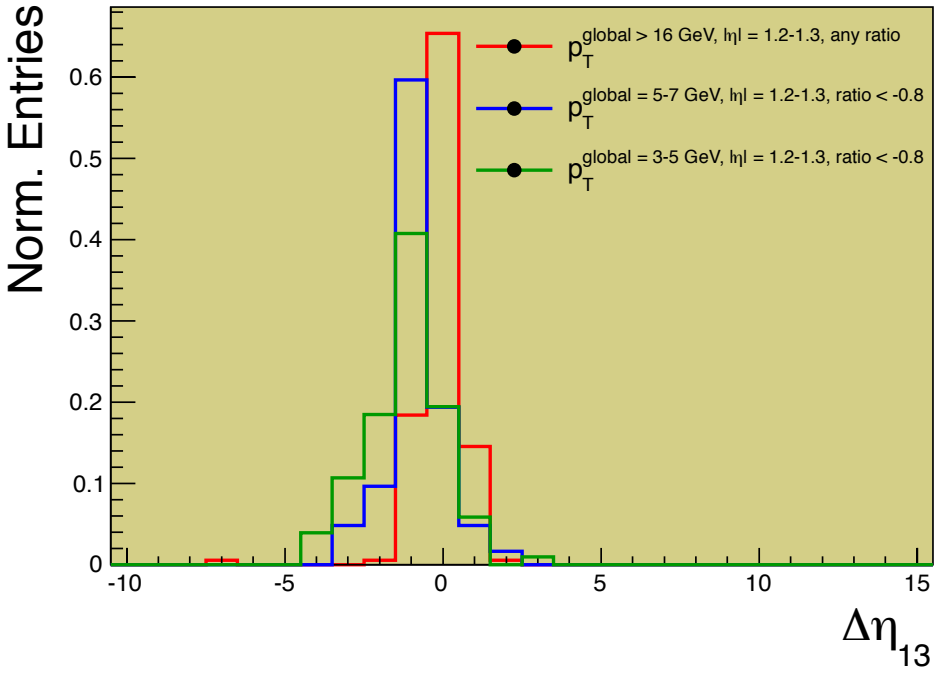


(Δϕ12 <<1)/(1<<12)*62°
Δϕ12 = 15 unit = 0.008 rad = 0.5°
like for high p_T

-> Δϕ12 and CLCT are looked like for high p_T tracks
- Could suppress tails for Quality = 2 using RPC information
  or extra information which we don't use now like Δη12

Δη study for Quality_CSCTF_tight = 2





HLT_L1SignleMu10 |η| = 1.2-1.3:

Δη12 = Δη between ME1-ME2 -> could be suppress by ~50% for pT = 3-5 GeV

Δη13 = Δη between ME1-ME3 -> could be suppress by ~30% for pT = 3-5 GeV

For reco pT = 3-5 and 5-7 GeV shown only problematic region with ratio < -0.8

For reco pT > 16 GeV is show all muons

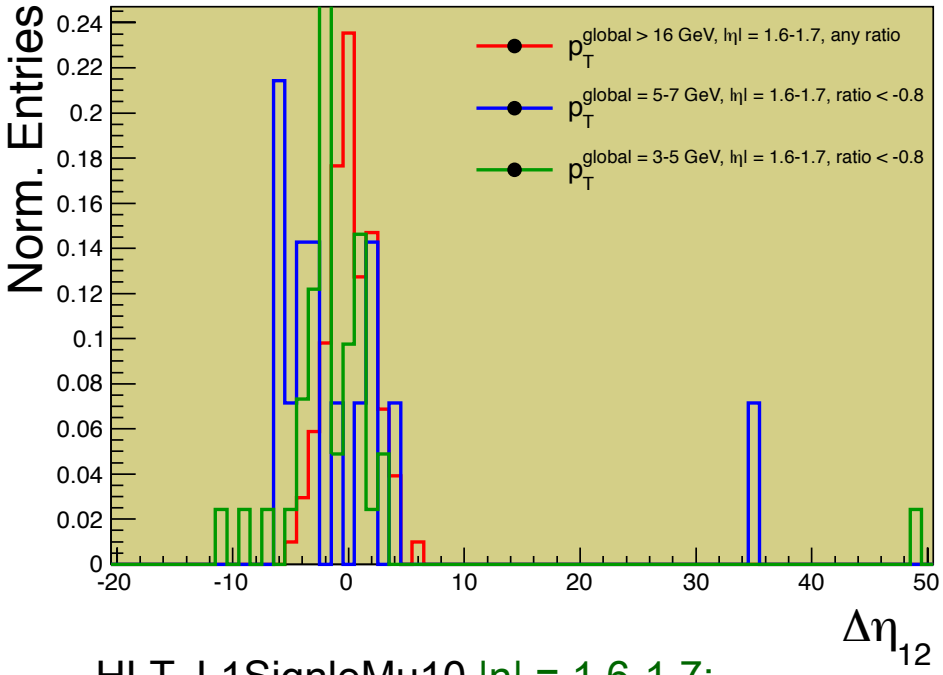
➔ Δη for reo pT > 16 GeV mostly in 3 bins: 0±1

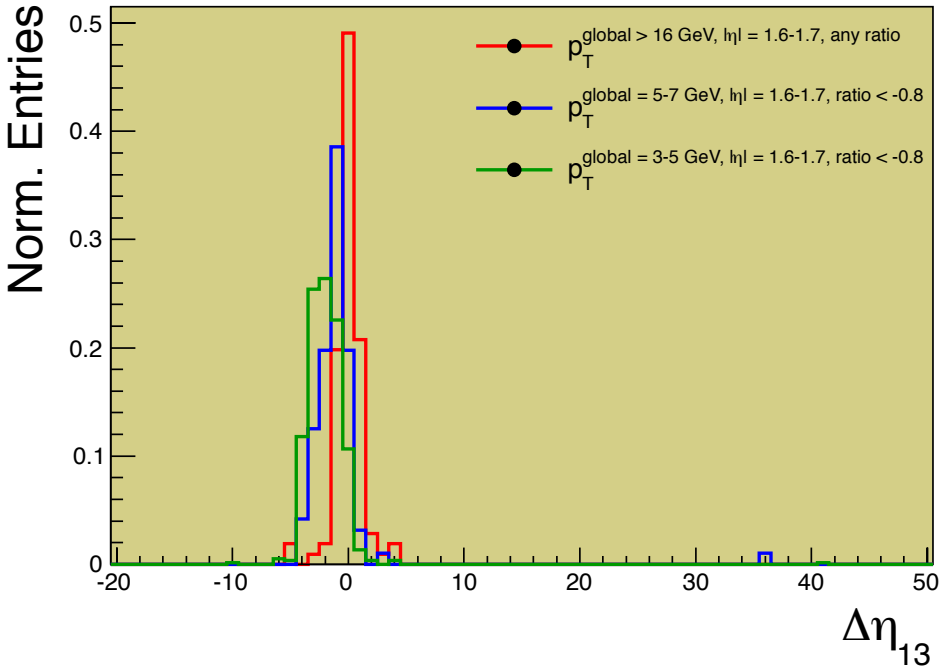
➔ Δη for low reco pT (blue, green curves) is wider then for high pT (red curve)

➔ similar Δη distribution is observed for η up to 1.6 for Δη12 and up to 1.7 for Δη13

➔ Δη could help in pt assigment and suppress part of problematic low pT

Δη study for Quality_CSCTF_tight = 2





HLT_L1SignleMu10 |η| = 1.6-1.7:

For Δη12 mode6 (ME1-ME2), mode 2 (ME1-ME2-ME3) and mode 3 (ME1-ME2-ME4)

For Δη13 mode7 (ME1-ME3), mode 2 (ME1-ME2-ME3) and mode 4 (ME1-ME3-ME4)

Δη12: completely mess, too big -> no help, should be understood:

- how Δη could be 35, 50?
- very-very wide for low pt: how? Don't we make η window 4 or it is only for 2 station track, could it be bug in my code or in firmware?

-> needs some comments and ideas from Alex

Δη13: still almost ok, and high pT in 3 bins: 0±1