



## CSCTF Pt assignment with 2010 data

By Anna Kropivnitskaya

- CLCT Pattern Study

## CLCT Pattern for ME1 station

CLCT patter definition:

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Hit pattern LUTs for 1 layer: - = don't care, xx= one hit or the other or both
Pattern      id=2      id=3      id=4      id=5      id=6      id=7      id=8      id=9      idA
Bend dir     bd=0      bd=1      bd=0      bd=1      bd=0      bd=1      bd=0      bd=1      bd=0
|            |            |            |            |            |            |            |            |
ly0  -----xxx xxx----- -----xxx- -xxx----- -----xxx-- -xxx----- -----xxx-- -----xxx-- -----xxx--
ly1  -----xx----- -----xx----- -----xx----- -----xx----- -----xx----- -----xx----- -----xx----- -----xx-----
ly2  key -----x----- -----x----- -----x----- -----x----- -----x----- -----x----- -----x----- -----x-----
ly3  ---xxx---xx----- ---xx---xx----- ---xx---xx----- ---xx---xx----- ---xx---xx----- ---xx---xx----- ---xx---xx----- ---xx---xx-----
ly4  -xxx- 4 -4 -xxx- -xxx- 3 -3 -xxx- -xxx- 2 -2 -xxx- -xxx- 1 -1 -xxx- -xxx- 0
ly5  xxx-----xxx----- xxx-----xxx----- xxx-----xxx----- xxx-----xxx----- xxx-----xxx----- xxx-----xxx----- xxx-----xxx-----
// Extent   0123456789A 0123456789A 0123456789A 0123456789A 0123456789A 0123456789A 0123456789A 0123456789A 0123456789A
// Avg.bend - 8.0 hs   + 8.0 hs   -6.0 hs   +6.0 hs   -4.0 hs   +4.0 hs   -2.0 hs   +2.0 hs   0.0 hs
// Min.bend -10.0 hs  + 6.0 hs   -8.0 hs   +4.0 hs   -6.0 hs   +2.0 hs   -4.0 hs   0.0 hs   -1.0 hs
// Max.bend - 6.0 hs  +10.0 hs  -4.0 hs   +8.0 hs   -2.0 hs   +6.0 hs   0.0 hs   +4.0 hs   +1.0 hs
  
```

On the next slides distribution of CLCT patterns are presented in according to numbers in red boxes.

CLCT pattern for ME1 is calculated with sign

**2 corrections is done:**

- If muon charge = -1 then pattern = -pattern

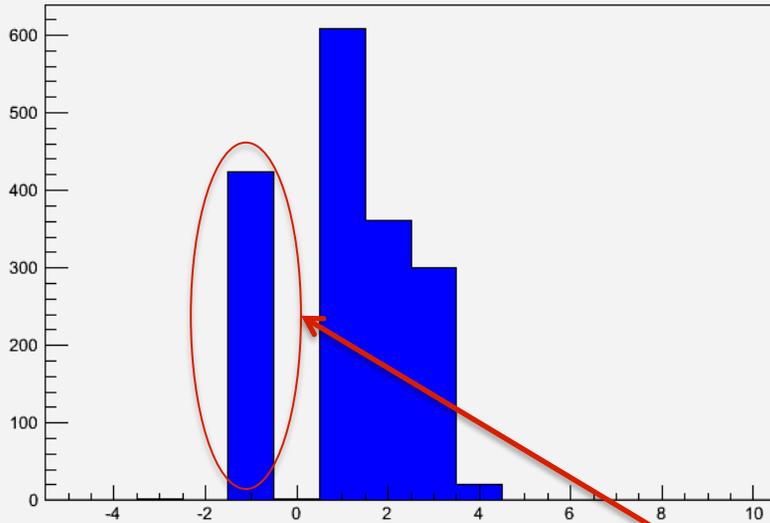
It was done to have the same deviation for  $\mu^+$  and  $\mu^-$

- If Endcap minus then pattern = -pattern

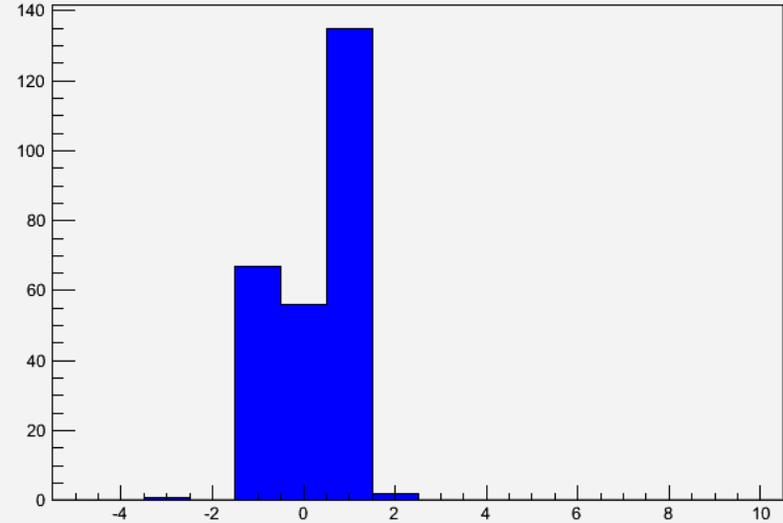
It was done because direction of pattern is not corrected on endcaps

# CLCT Pattern for ME1 station: eta = 1.3-2.1

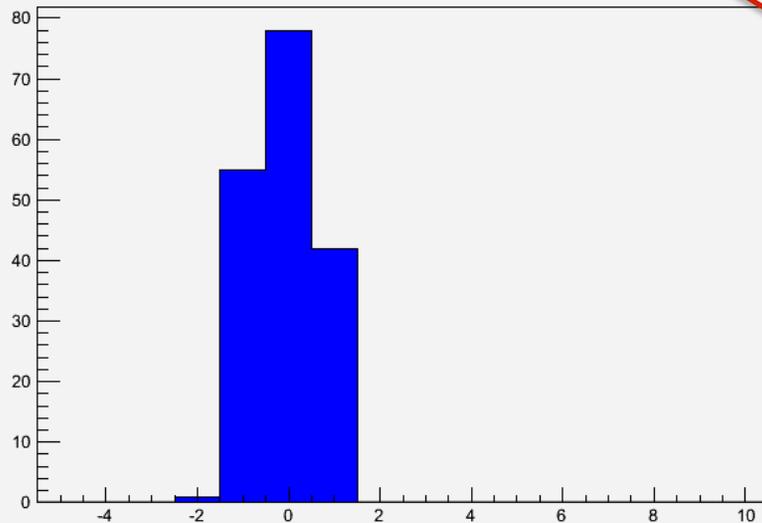
PT bin 2: 3.0- 3.5 GeV, ETA bin 5: 1.4- 1.5



PT bin 11: 10.0-12.0 GeV, ETA bin 5: 1.4- 1.5



PT bin 20: 50.0-80.0 GeV, ETA bin 5: 1.4- 1.5

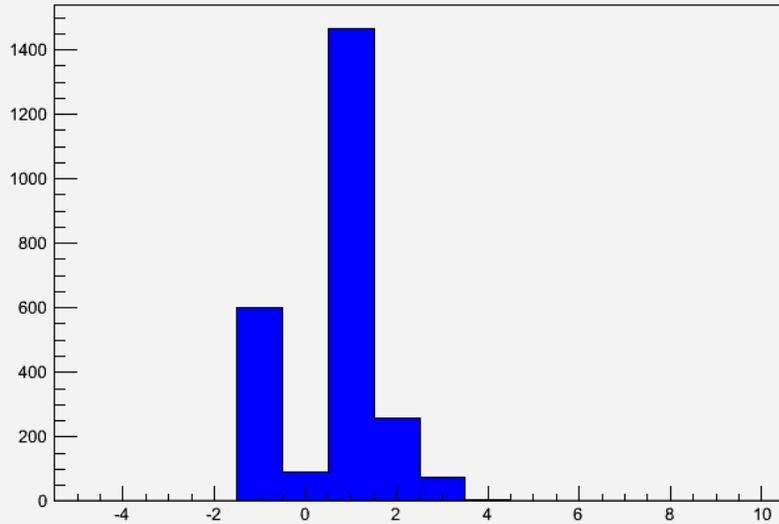


Strange peak at -1, maybe due to bad lct quality, should be understood

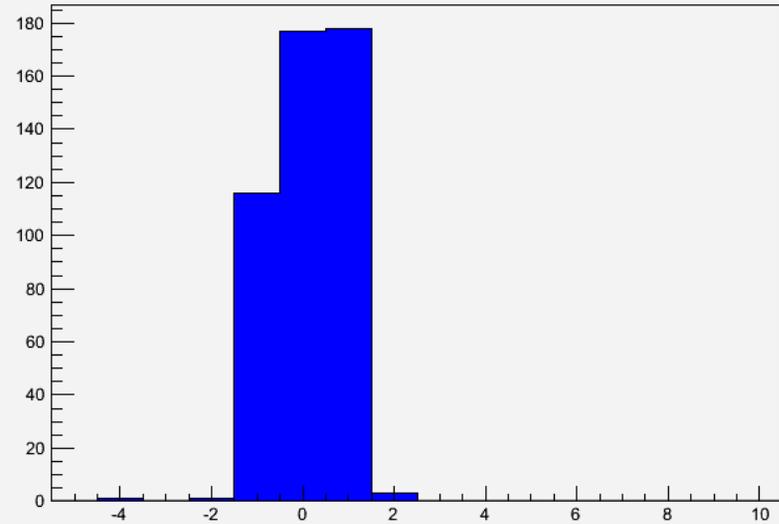
- High PT tracks have CLCT pattern = -1, 0 and 1
- Pattern information from ME1 station maybe could PT assignment at almost in all golden region:  $1.3 < \eta < 2.1$

# CLCT Pattern for ME1 station: $\eta < 1.3 \parallel \eta > 2.1$

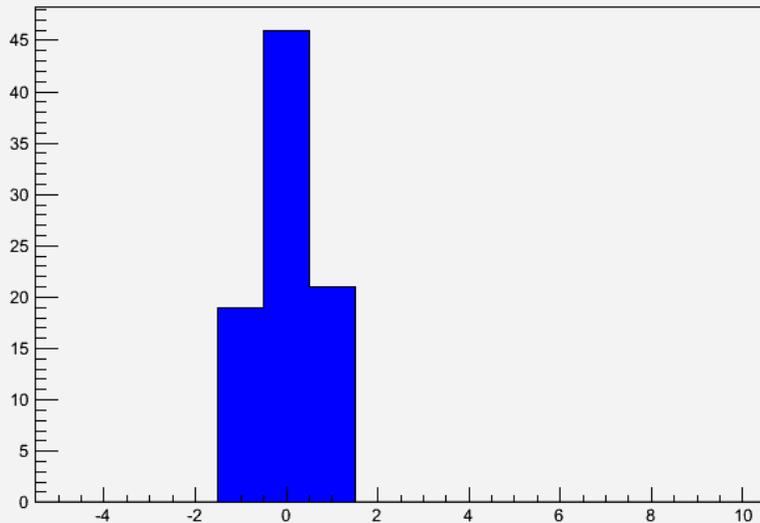
PT bin 0: 2.0- 2.5 GeV, ETA bin 12: 2.1- 2.2



PT bin 11: 10.0-12.0 GeV, ETA bin 12: 2.1- 2.2

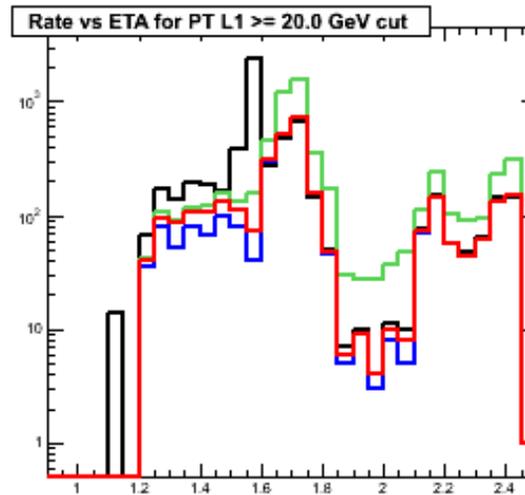
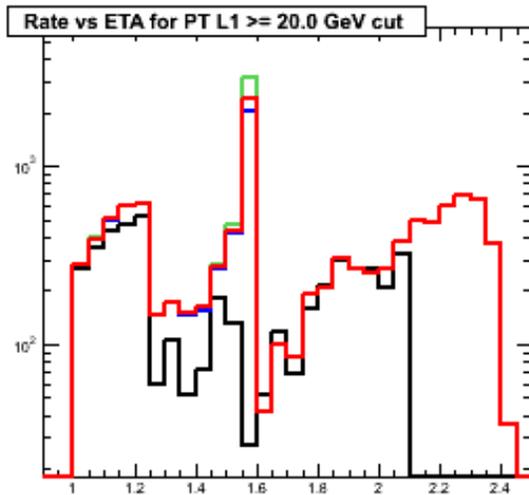


PT bin 20: 50.0-80.0 GeV, ETA bin 12: 2.1- 2.2



- High PT tracks have CLCT pattern = -1, 0 and 1
- Pattern information from ME1 station completely useless at :  $\eta < 1.3$  and  $\eta > 2.1$   
It is cover completely overlap and high eta region and partially golden eta region

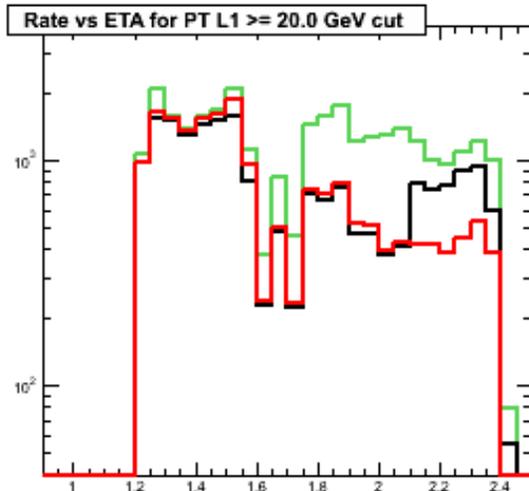
# CSCTF Rate vs. Eta for different methods PT CSCTF > 20 GeV



- Old method 2010
- Ne method
- New method + high
- New method + CLCT patter

In New method I make some changes in quality definitions:

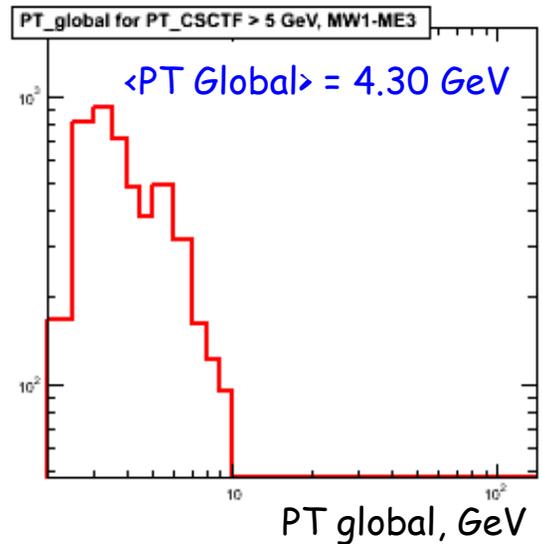
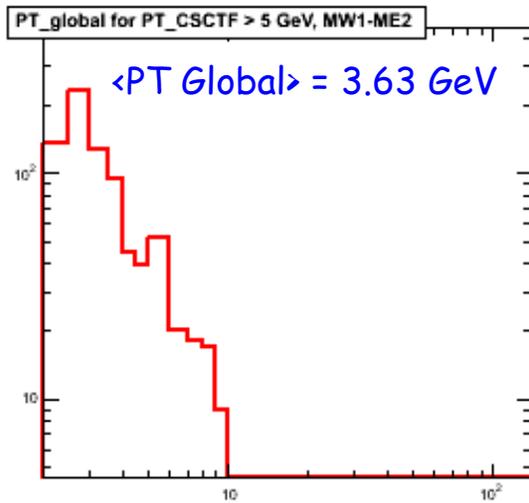
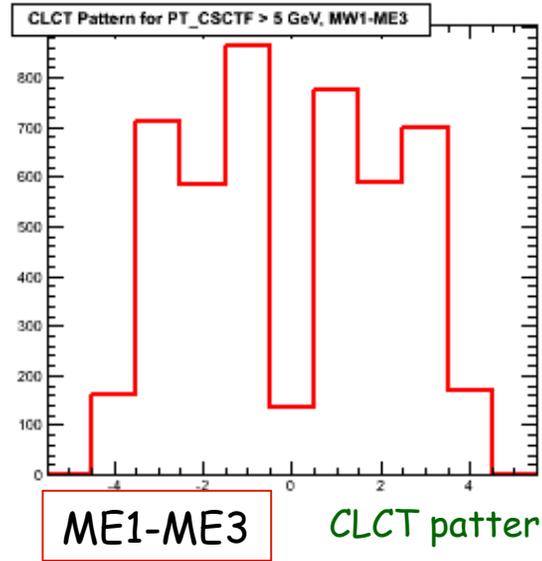
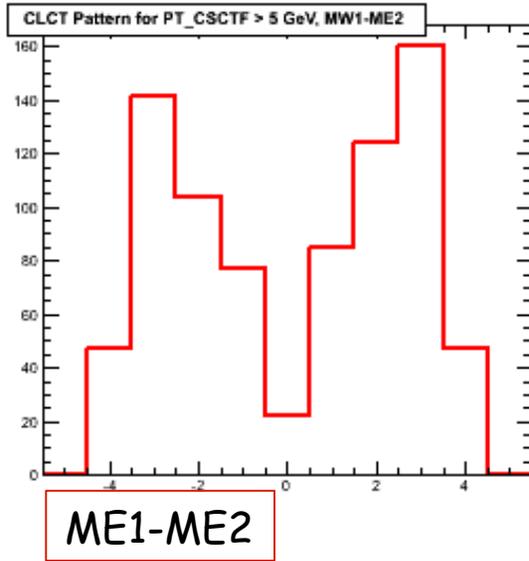
1. ME2-ME3-ME4 for eta > 2.1 become Q = 1 as for eta < 2.1
2. ME1-ME3 for eta < 1.7 become Q = 1 <- should be return to Q=2 in new method



Why does CLCT pattern work worse for ME1-ME3  
Then for ME1-ME2? -> see next slides!

If Q = 1 for ME2-ME3-ME4 for eta > 2.1 and we apply max pt method than rate stay almost the same

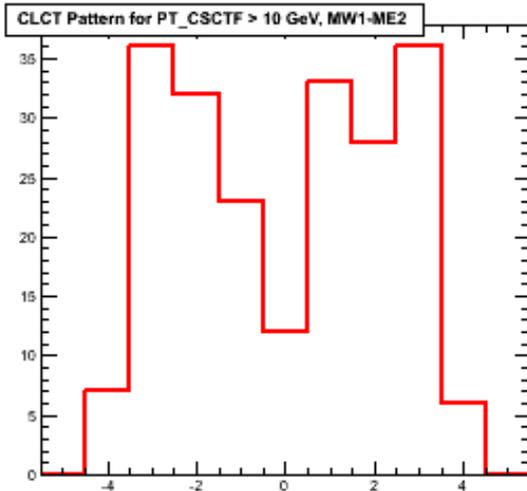
# CLCT Pattern



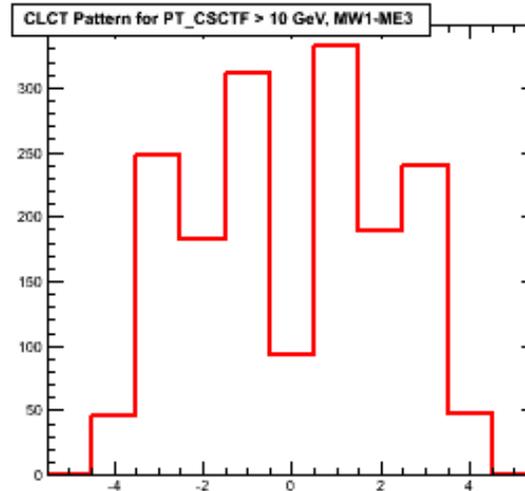
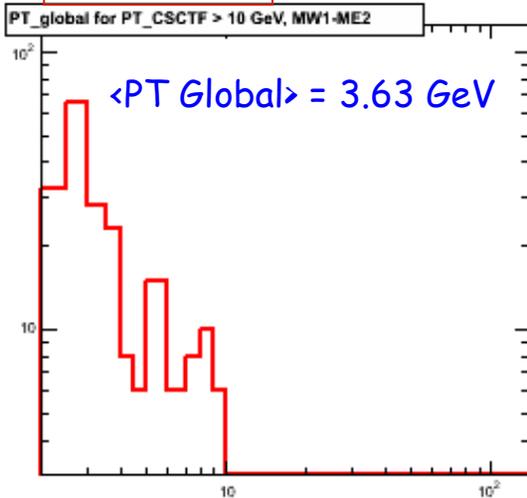
Here:  
 PT global < 10 GeV  
 PT CSCTF > 5 GeV  
 Eta CSCTF = 1.5-1.6

⇒ For ME1-ME3 CLCT patter work worse then for ME1-ME2 because in ME1-ME3 mean of global muon greater then in ME1-ME2

# CLCT Pattern

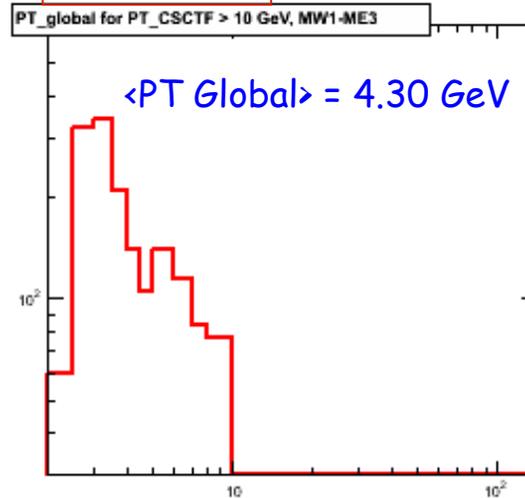


ME1-ME2



ME1-ME3

CLCT patter



PT global, GeV

Here:

PT global < 10 GeV

PT CSCTF > 10 GeV

Eta CSCTF = 1.5-1.6

⇒ For ME1-ME3 CLCT patter work worse then for ME1-ME2 because in ME1-ME3 mean of global muon greater then in ME1-ME2

## Conclusion

⇒ For ME1-ME3 CLCT pattern work worse than for ME1-ME2 because in ME1-ME3 mean of global muon greater than in ME1-ME2

⇒ CLCT pattern could reduce rate only by 15-20% even in  $\eta = 1.5-1.6$