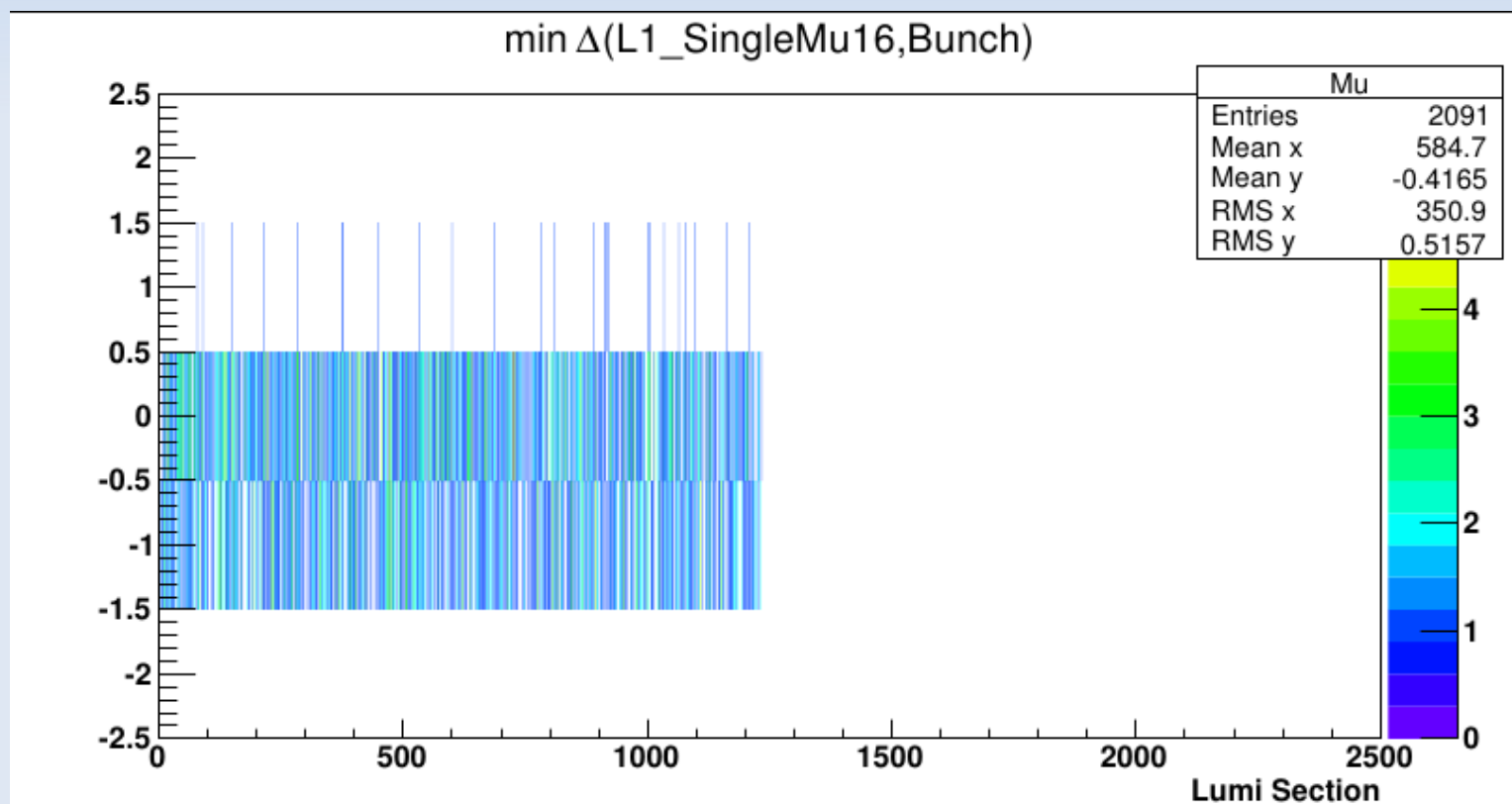# Muon Trigger Issue

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What & How

- During the implementation of new way to monitor L1T Synchronization we have found +25% SingleMu events out of time

Example event

```
BX=-1
mu GMT  chg=-1 pt=140 eta=-1.25 phi=3.53429 qlt=5
mu RPCf chg=-1 pt=140 eta=-1.3  phi=3.53429 qlt=0

BX=0
mu GMT  chg=-1 pt=  8 eta=-1.25  phi=3.53429 qlt=7
mu CSC  chg=-1 pt=  8 eta=-1.275 phi=3.53429 qlt=3
mu RPCf chg=-1 pt=140 eta=-1.3   phi=3.53429 qlt=0
*-----*----*----*----*----*----*
|bx ev| -2 | -1 |  0 | +1 | +2 |
|-----+----+----+----+----+----|
|bx nr| 588| 589| 590| 591| 592|
| lhc |  1 |  0 |  1 |  0 |  1 |
|bit56|  0 |  1 |  0 |  0 |  0 |
|-----+----+----+----+----+----|
| GMT |  0 |  1 |  1 |  0 |  0 |
|-----+----+----+----+----+----|
|  DT |  0 |  0 |  0 |  0 |  0 |
| CSC |  0 |  0 |  1 |  0 |  0 |
| RPCb|  0 |  0 |  0 |  0 |  0 |
| RPCf|  0 |  1 |  1 |  0 |  0 |
*-----*----*----*----*----*----*
```

- Events taken by RPC at BX=0 are also present at BX=-1
- But if another system sees muon in BX=0 with better quality then pT will be taken from that sub-system.
- Then inf pT in BX=0 and -1 are above and below a trigger threshold then trigger only fires in bx=-1
- This is not a problem now because of BPTX veto but for consistency value in bx=-1 should be equal to the one in bx=0 for the same muon.