Table of Contents

GLB, STA, trig rates, firsts ...

Problem:

- STA: 400/1990events, GLB:17/out of 400 STA
    - ◆ CSC problem? -- NO
    - ◆ halo muons (get many sta that are not matched to tracker tracks) ? -- NO

Investigation

- look at number of valid, bad,lost hits for STA muons, from DT, CSC, RPC separately, vs pT, eta.
- verify the same info versus the trigger firing

Results

- in the following:
    - ◆ triga=HLT_HIL1SingleMu3_Core, trigb=HLT_HIL1DoubleMuOpen_Core
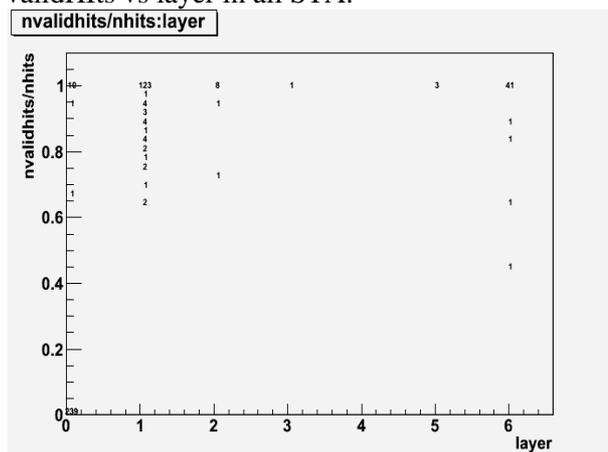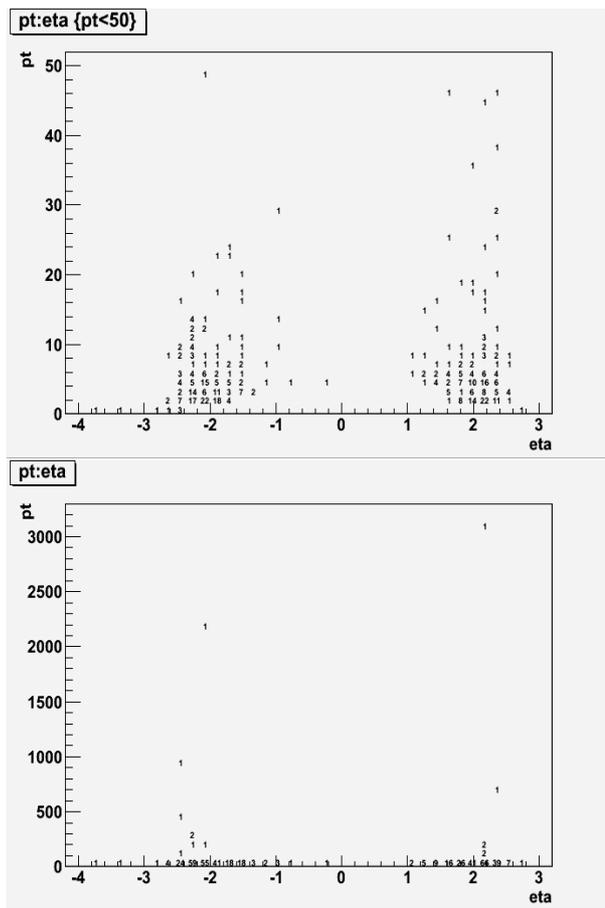   - ◆ trk is STA or GLB, according with the caption

CSC-s (https://hypernews.cern.ch/HyperNews/CMS/get/muonReco/178.html⤢)

Plots for CSC layer_station_etc on ypernews▶ Hide settings ▾

- staLastHitDetId_v2.pdf:
    - ◆ many bad STA, on which we most certainly trigger
    - ◆ last hit position is on second CSC station--expected for punch-through.

- validHIts vs layer in all STA:


- pt<10GeV, sta all:

- lessons learned from the email exchange, regarding the STA reconstruction:
    - ◆ Layers 0-6:
        - ◊ a segment is labelled by the chamber alone and L=0 ('Layer=0' means the entire chamber:). segments have allocated L=0;
        - ◊ a 2D-rechit is labelled by the specific Layer L=1-6 it is on.2D hits are associated with layers 1->6;
        - ◊ the position of a segment is based on the centre of the chamber rather than a specific layer; this centre is between two layers (hence the L=0)
    - ◆ too many L=0 when requiring 'last *hit* position on the track', as in principle the track reconstruction uses the hits (2D or the ones from the segments)
        - ◊ Ricardo: if hits become invalid, it can happen (confirmed by me: L=0 correspond to sta-s for which nvalidHits/nhits=0)
        - ◊ Daniele Trocino:
            - · two possible cases in which a stand-alone track is made of segments:
                - • 1) less than two segments (DT, CSC) / hits (RPC) are marked as "valid" in the forward pattern recognition (inside-out): in this case, the remaining valid segments/hits, if any, are "invalidated" and the track will contain only invalid segments/hits. The invalid hits are not used in the global reconstruction, so the global fit will coincide with the fit in the tracker. In p-p runs at 7 TeV, about 3% of the global tracks (out of the box, no selection applied) are of such kind;
                - • 2) the forward pattern recognition succeeds (>= 2 valid segments/hits), while the backward one (outside-in) fails: in this case, the outcome of the forward step is taken, so the track contains valid segments, which are used in the global fit (the fitter is flexible enough to handle hits or segments). This case is very rare: only 0.01% of the global tracks (7 TeV, no selection) is built with this kind of STA tracks.

· Vyacheslav (long story short):
  - The forward fit and pattern reco use segments,the backward fit/smooth uses hits.
  - If the backward fit/smooth fails, you still get a track returned, in this case you get segments in return.

Trigger and offline STA and GLB

Trigger vs muons▶ Hide settings ▼

- number of STA-s (and their pt-eta distribution) when singleMu3Core trigger fired:
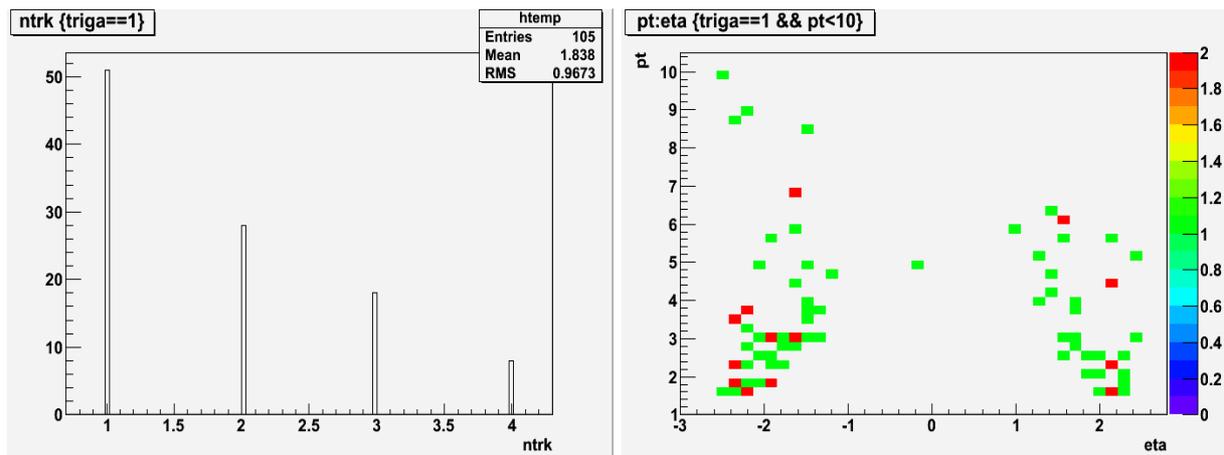

- select the portion of luminosity that had the tracker ON (duh!) aka, there was stable beam.

```
mylist = ['150431:148-150431:9999']
process.source = cms.Source("PoolSource",
                            fileNames = cms.untracked.vstring("rfio:///castor/cern.ch/user/e/edwe
                            lumisToProcess = cms.untracked. VLuminosityBlockRange(mylist),
                            noEventSort = cms.untracked.bool(True),
                            duplicateCheckMode = cms.untracked.string("noDuplicateCheck")
                            )
```

- triga=HLT_HIL1SingleMu3_Core: trk=STA (left) and trk=GLB (right) for run 150431 and **lumi>148**, :
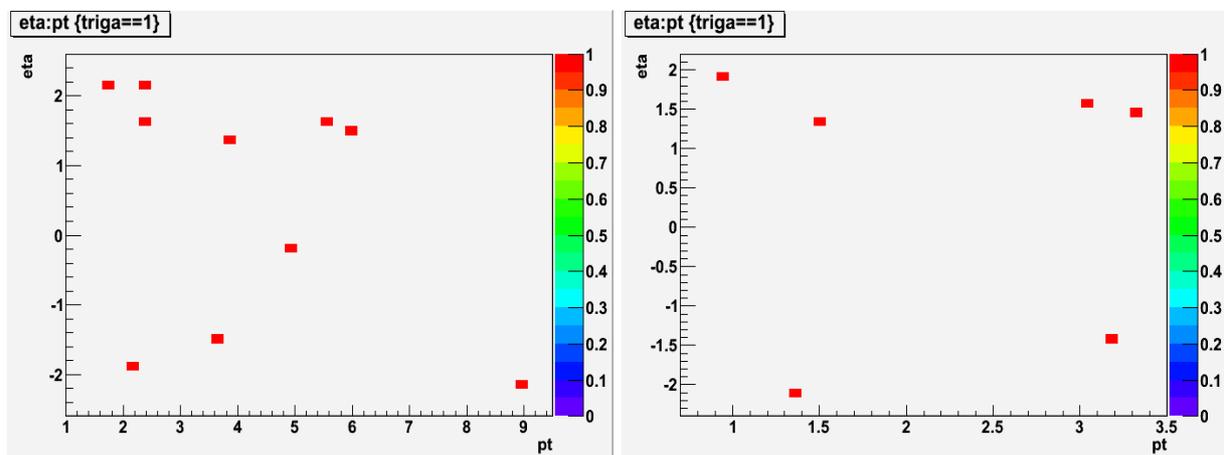
- triga=HLT_HIL1DoubleMuOpen_Core: trk=STA (left) and trk=GLB (right) for run 150431 and **lumi>148**, :
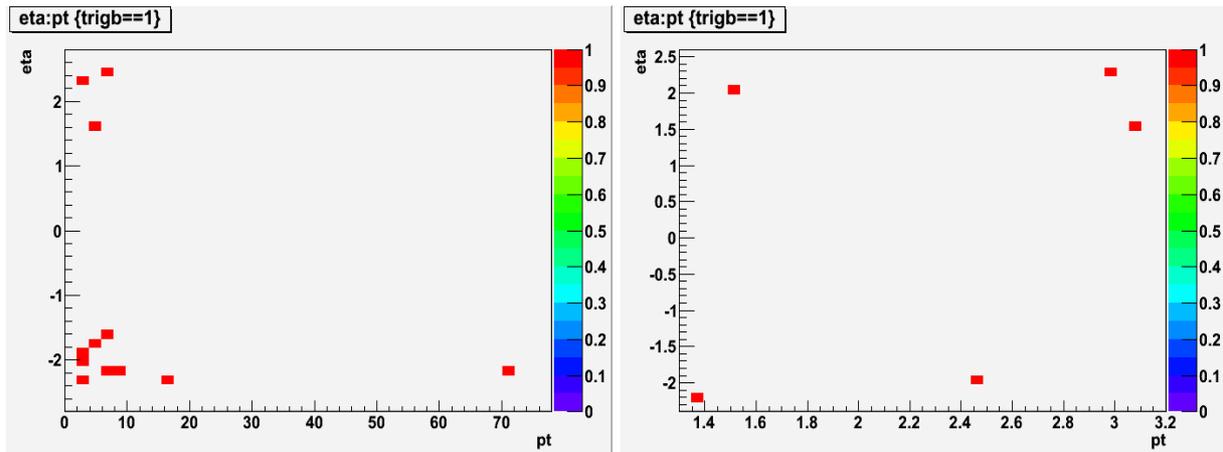
Now what?

- change the trigger, to fire when having 3 stations hits (as opposed to 2); L2 trigger.-- Cath

-- CameliaMironov - 09-Nov-2010

This topic: Main > RealDataSta1
Topic revision: r5 - 2010-11-10 - CameliaMironov