Update from CERN

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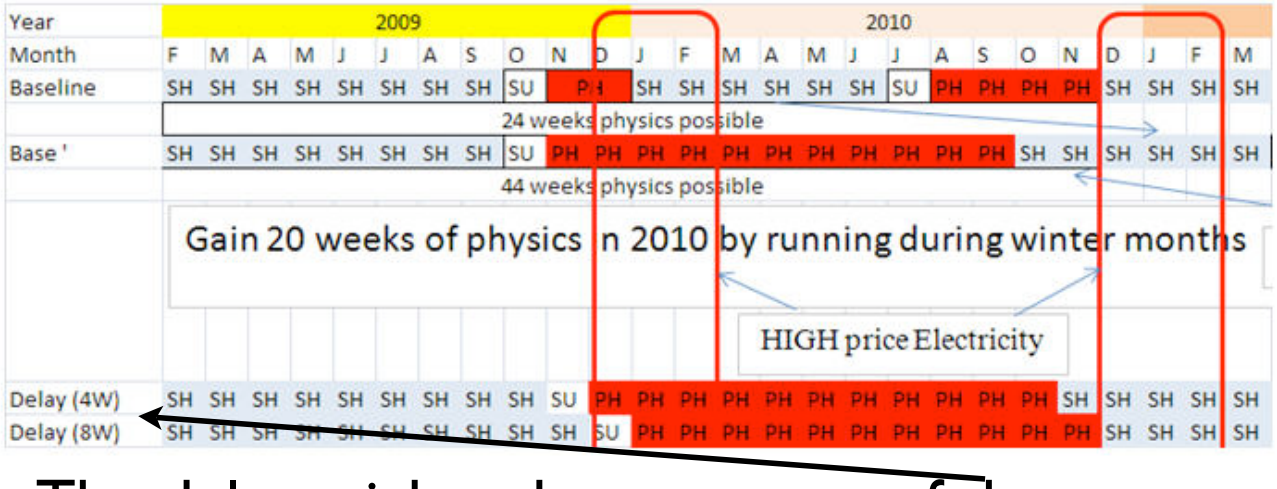
-Davis Group Meeting

LHC Update

CMS HI DiLeptons

- Officially supposed to start October/November 2009, there have been a few delays that were mentioned during CMS week



The delay might take us to one of these scenarios?, not sure...

The PbPb run is scheduled to be at the end of this run for a period of about two weeks at $\sqrt{s}$ = 4TeV.

CMS HI Dileptons

- Under the CMS Collaboration I am part of the CMS Heavy Ions (CMS HI)
  - The five Physics Interest Groups (PInGs[Not PIGs]) are:
    - Dileptons
    - High-Pt
    - Spectra
    - Correlation/Flow
    - Forward Physics
  - I am in the dileptons, with Raphael Granier de Cassagnac(convener), Olga Kodolova, 2 postdocs from LANL(Catherine and Camelia), a CERN fellow(Torsten) and 2 grad students from Korea(DongHo and JiHyun)

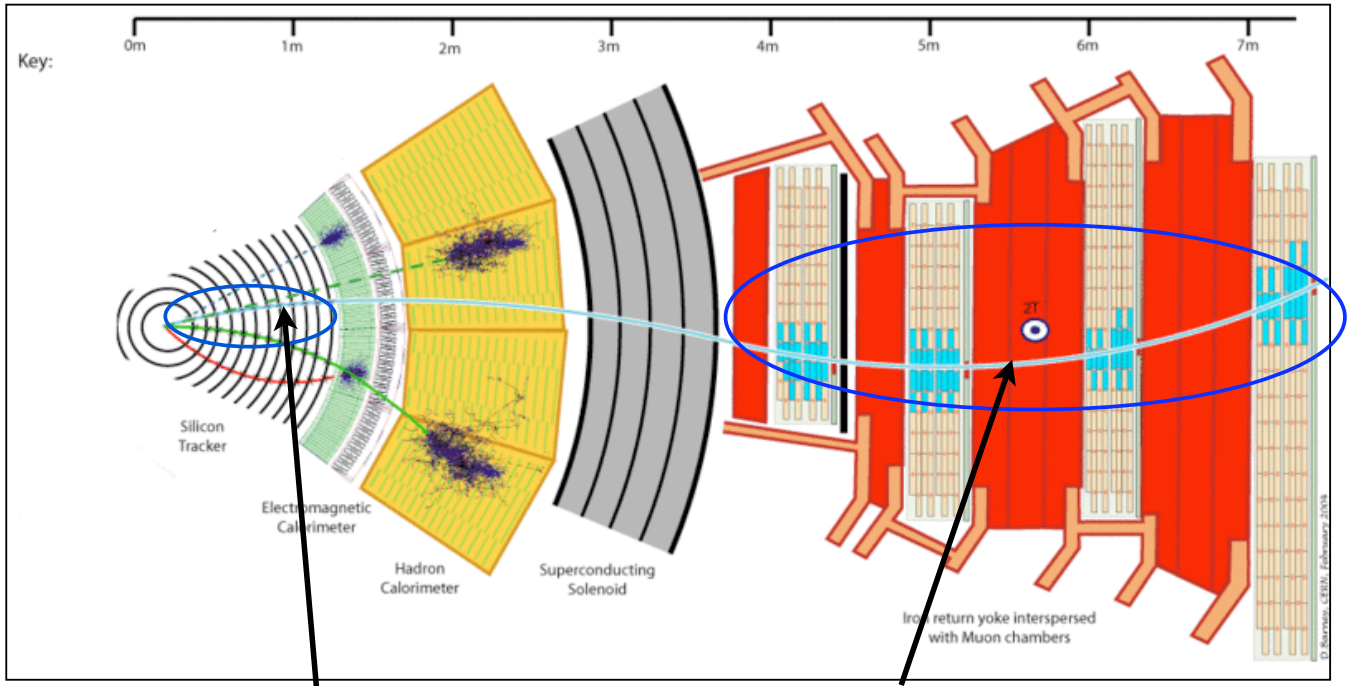
Review

- On the analysis side, I want to look at $Z^0 \rightarrow \mu^+\mu^-$ in Pb-Pb collisions
  - To study the muon reconstruction efficiency have to:
    - 1)Generate data by using the mixing module, mix a signal event with a background event.
    - 2)Do various data formats adjustments, a little obscure to me(but it works).
    - 3)Run the reconstruction sequence and get global muons.

Review II

- 4)Do some mapping, using Muon Associator By Hits(MABH), to the MC data
  - Find a MC muon, get this particle barcode, loop trough the simTracks match barcode and get the corresponding reconstructed globalMuon
  - Applying a cut, that requires 70% of the reconstructed muon track hits to be shared with the MC track.
- 5)Plot kinematics of MC data over Reco data

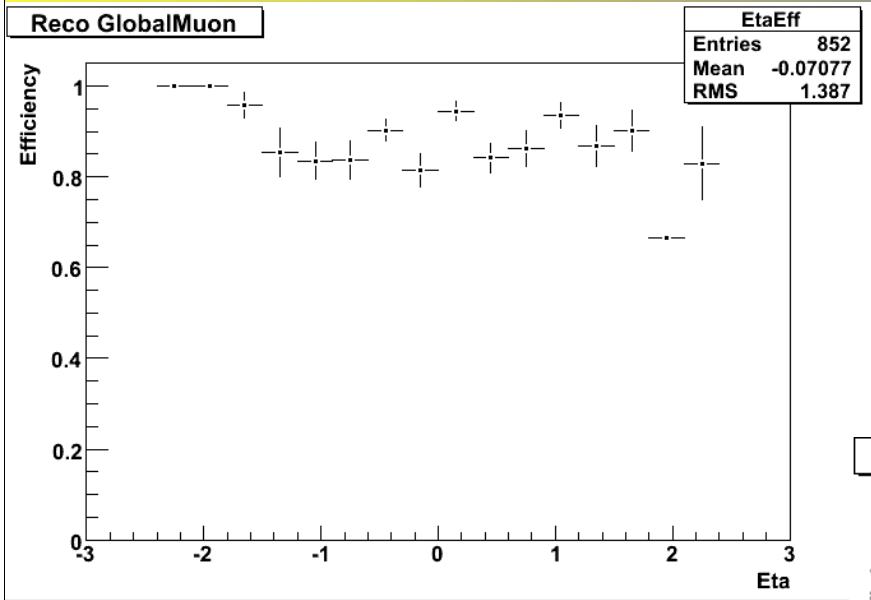
Muon objects



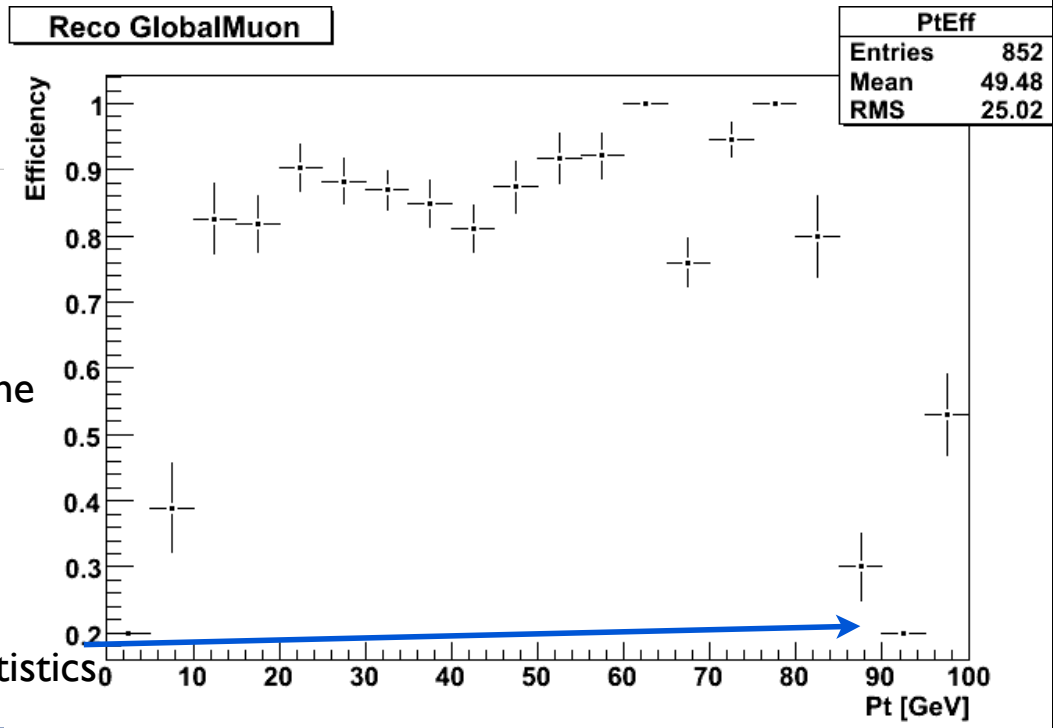
Tracker Muon + StandAlone Muon = Global Muon

In a HI environment the efficiency of the tracke drops to ~60% because of high multiplicty, to find a muon we need to find a track in the muon chambers and propagate it back to match a track in the tracker

Efficiencies



Pythia ($Z^0 \rightarrow \mu^+\mu^-$) + Hydjet Event Mixing
Total of 1000 generated events



Some improvements have been done to the HI-Muon Reco code and we get an efficiency of about 85%

Low statistics in HighPt bins, need statistics

Reconstruction Details

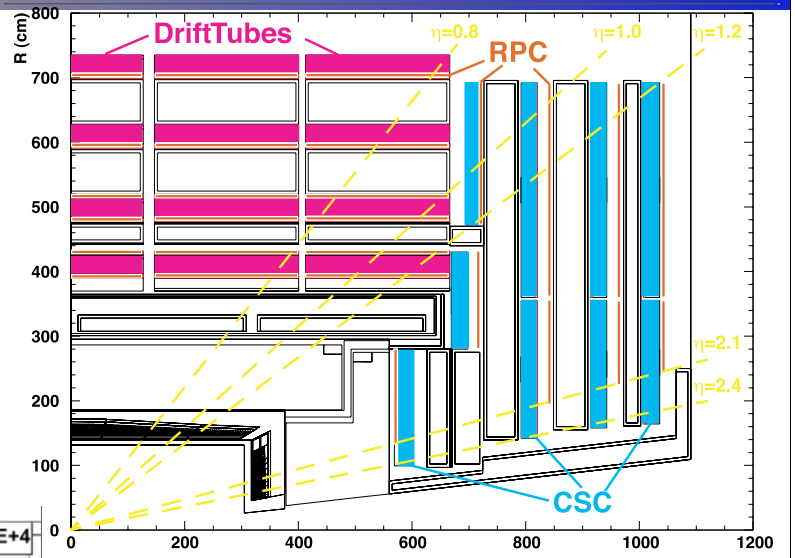
- To improve efficiency some ideas have been brought up
  - Reduce the number of pixel hits required, currently 3.
    - With this we expect to get less combinatorial fakes from misassociated hits when forming tracks.
  - Use regional tracking, to match tracker muons with STA muons
    - When a STA muon track is found, estimate next location of next hit in Tracker and only look for it in a given a small range.
- Will try to implement and compare

Tasks at hand

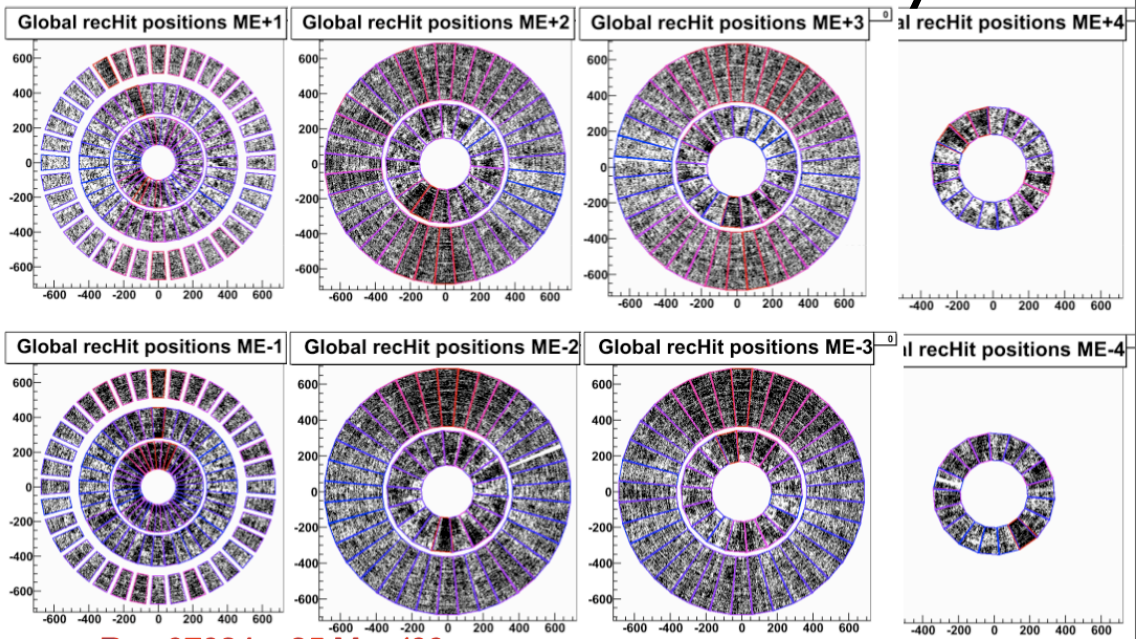
- Test our reconstruction algorithm in the new environment. (from CMSSW_2_2_9 to CMSSW_3_1_X)
- Test data production configuration that fits our simulation needs so we can provide them to the simulation experts produce in large numbers.
- Come up with DQM plots from muon detectors for the HI run.
  - Based on pp DQM plots.
- Define HI-Reco Muon objects (Reconstruction sequences, Kinematic cuts, etc) to create Physics Analysis Tools(PATs)
  - PAT are well defined objects that can be used directly for analysis, they are a step beyond reconstruction.

CSCs

The Cathode Strip Chambers are part of the Muon EndCaps



Data from cosmic rays



With the CSCs group I will be looking at the STA muon reconstruction, from the HI point of view.

CMS

Now all the endcap rings are assembled together access to the cavern is not possible any more.

CMS is getting ready for Cosmic Rays At Four Tesla(CRAFT)

The End

- I will try to maintain my Twiki page to put updates.