Study of Crack Regions

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Hadronic Calibration WS
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Origin of Fake Missing E_T

- Particles towards DM area.
- unreconstructed muon /punch though pion in jet
- Neutrion in c, b- jets (...it is real missing E_T)

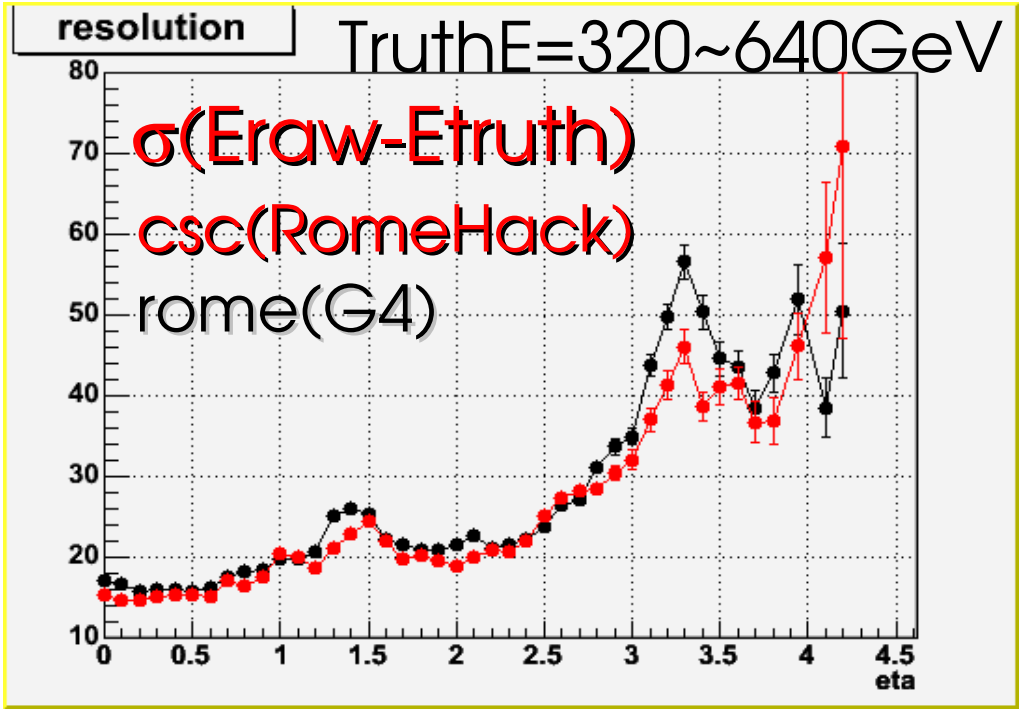
Variables used in this analysis

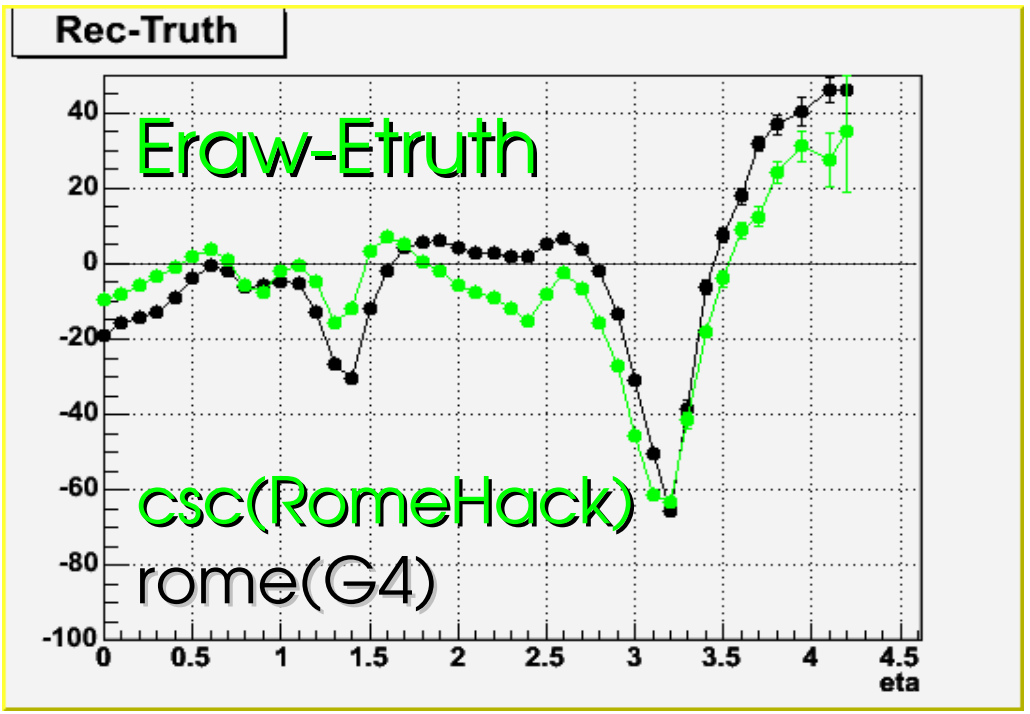
- Cone7 is used for reconstructed and truth jets
- Matching R = 0.1
- Use H1WeightToolRomeHack calibration

Data sample : CSC RDO is reconstructed by 11.0.41

forward jet : FJ2 (E>100GeV), FJ3 (E>1TeV)
di-jet : Jx (x=3,4,5,7,8)
} ~44.2k
single pion : singlepi10 (E>1TeV) ~117k

Define crack regions by Jets



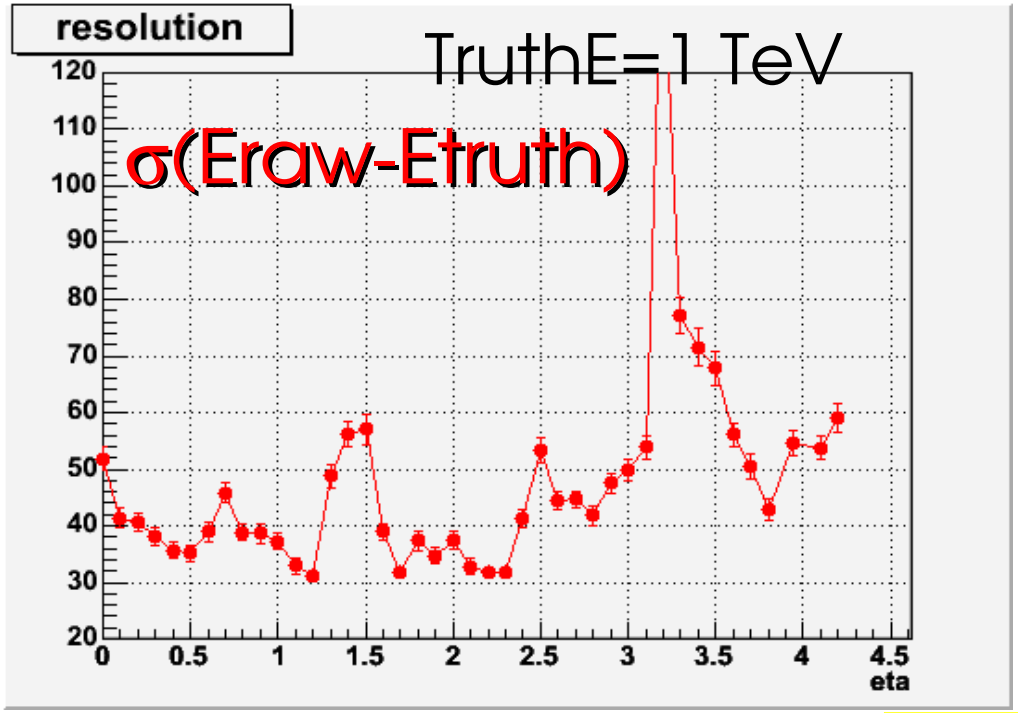


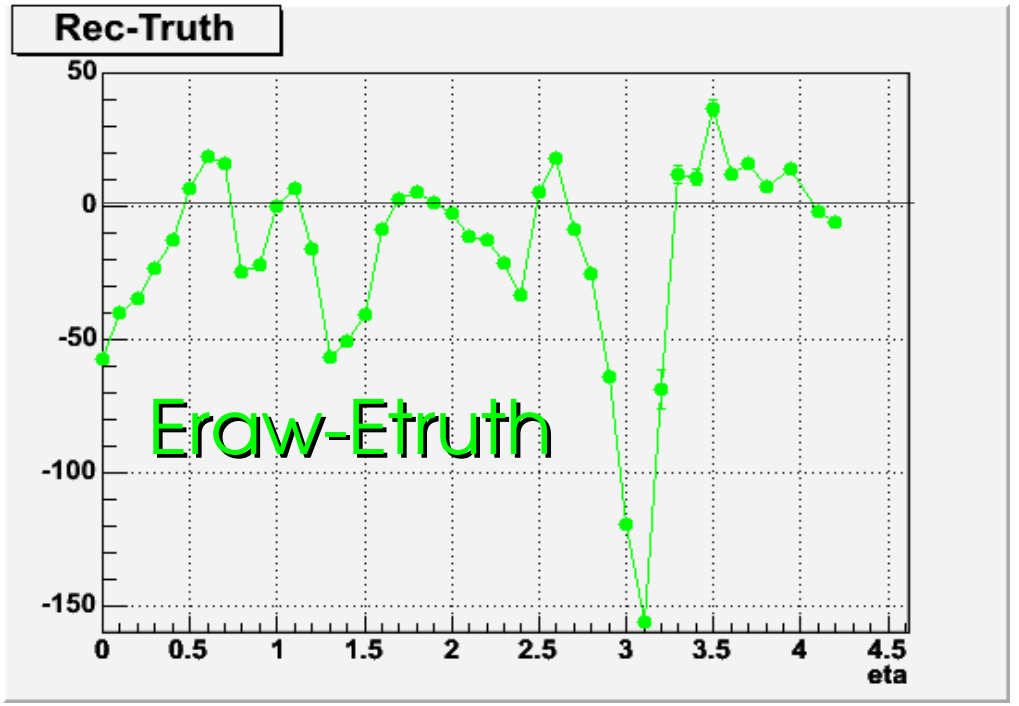
$$Ecor = \frac{(E_{HAD}+E_{cryo})}{Eraw} \times f(Et,\eta)$$

Resolution degradation can be seen around eta=1.4 and 3.2.
Smaller degradation around eta=3.2 in csc sample.

Energy loss can be seen around eta=0 and 1.4 and 3.2
Smaller loss around eta=0 and 1.4 in csc sample.

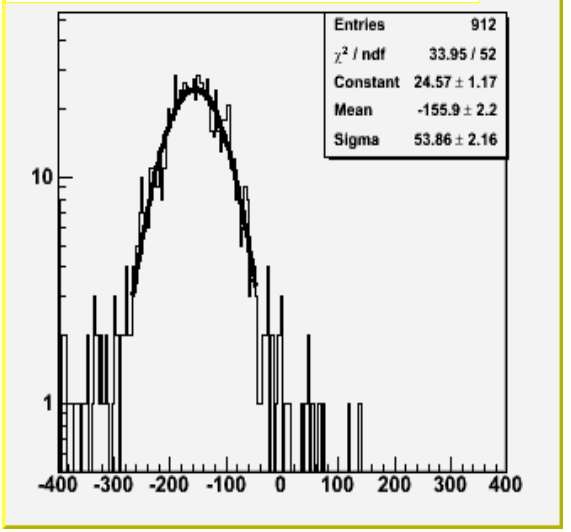
Define crack regions by single pion



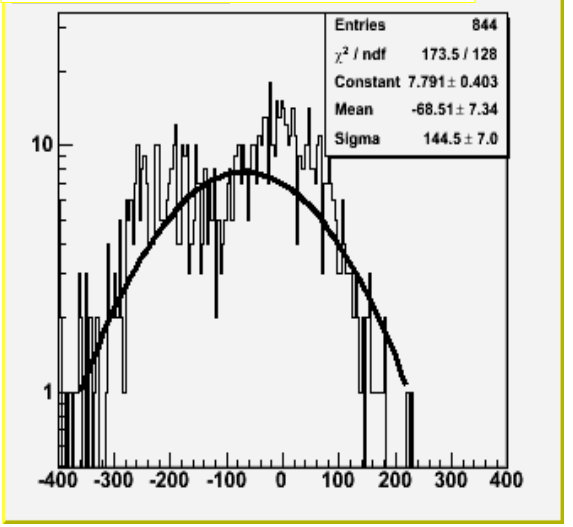


Similar behaviour as jet samples, but more clear effect of crack can be observed.

Eta=3.1~3.2



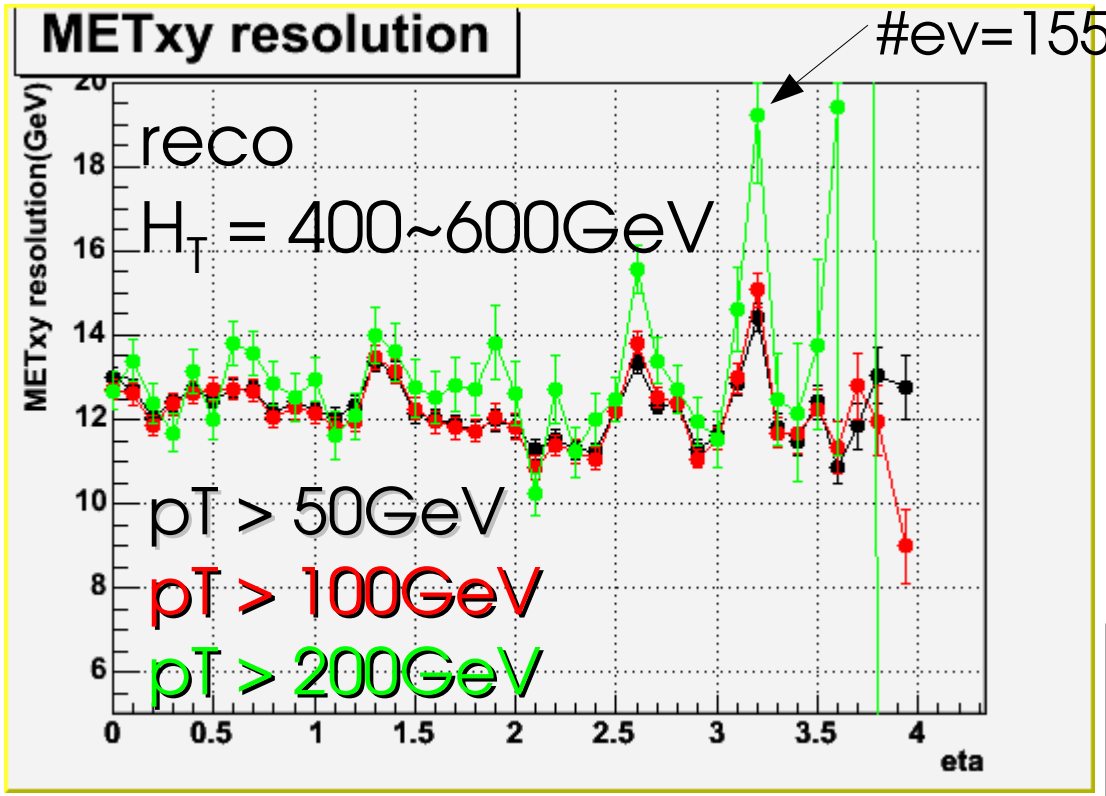
Eta=3.2~3.3

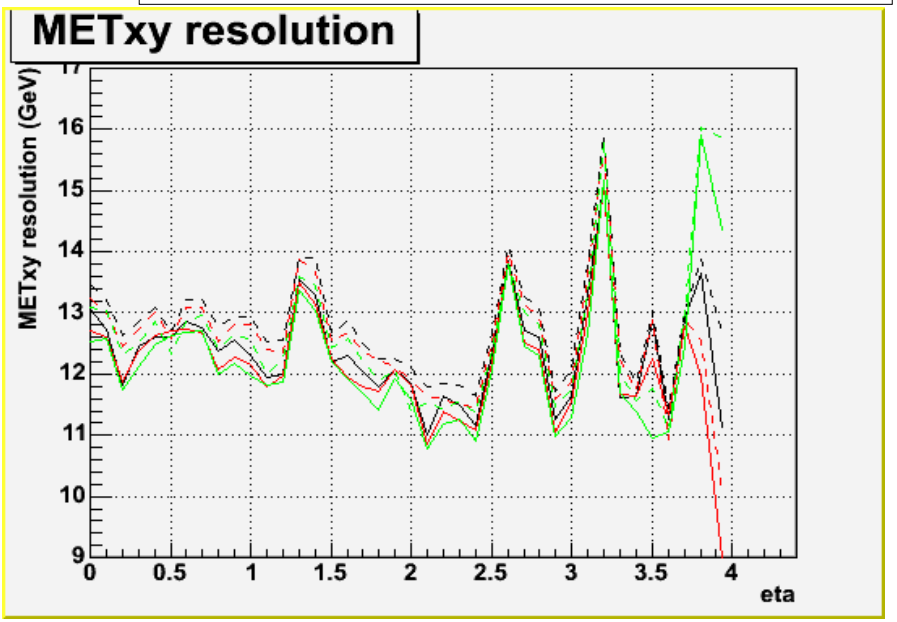


Impact on Missing Et resolution

fit : ---- 2, - - - 3 sigma
binning: 4, 2, 1 GeV

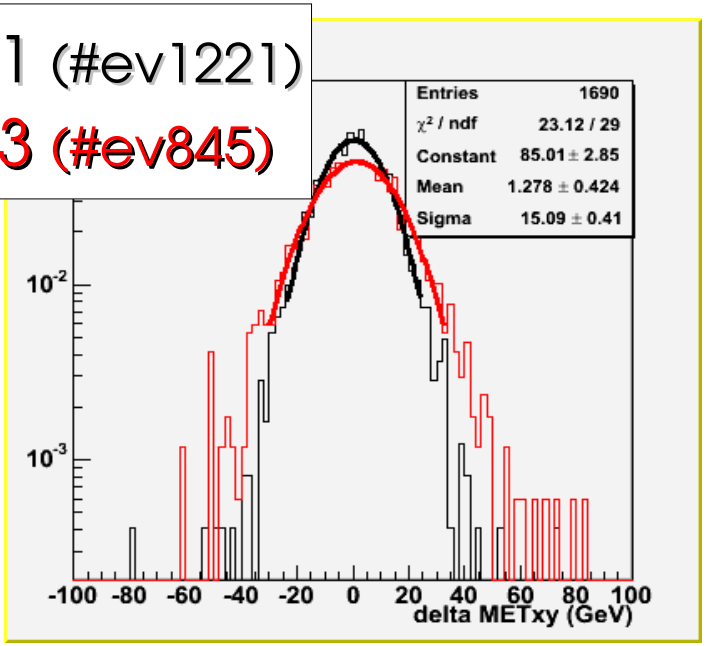
At leat one jet towards to X.





- Cannot see tail.
  (Less statistics to see more higher H_T)
- Almost same impact on MET
  with crack at eta=1.4 and 3.2?
  (but not so large...)

η=3.0-3.1 (#ev1221)
η=3.2-3.3 (#ev845)



Summary (what I/we do not understand)

- Crack regions are clear with result of jet/single pion resolution and energy loss.
- Which crack region has the strongest impact on MET resolution?
- Resolution degradation can tell tail (non-gaussian) effect?
- A jet with more EM component ($\pi 0$) towards crack region may cause a tail?

Any other comment?

recoH$_T$ = 400~600GeV