HF PWG Weekly Meeting

High Pt NPE analysis on P+P Run2012 @200Gev

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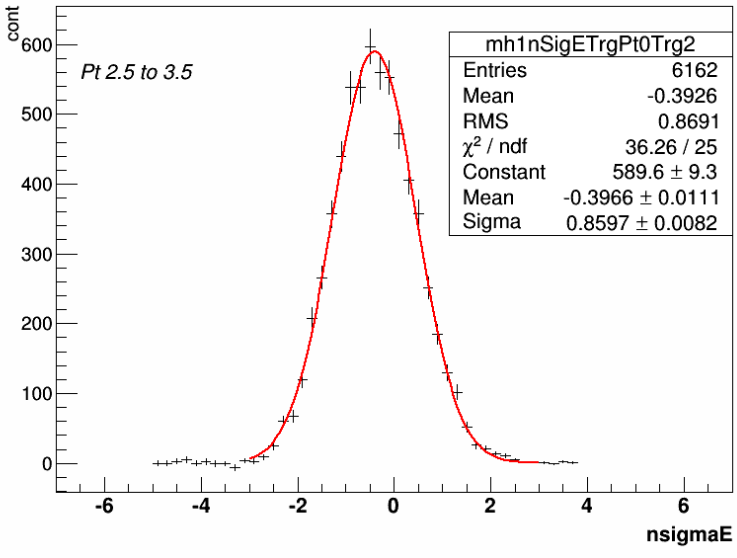
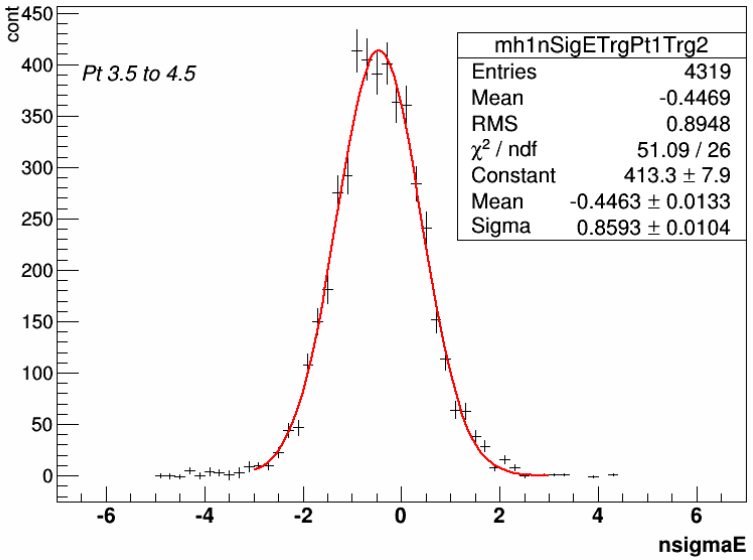
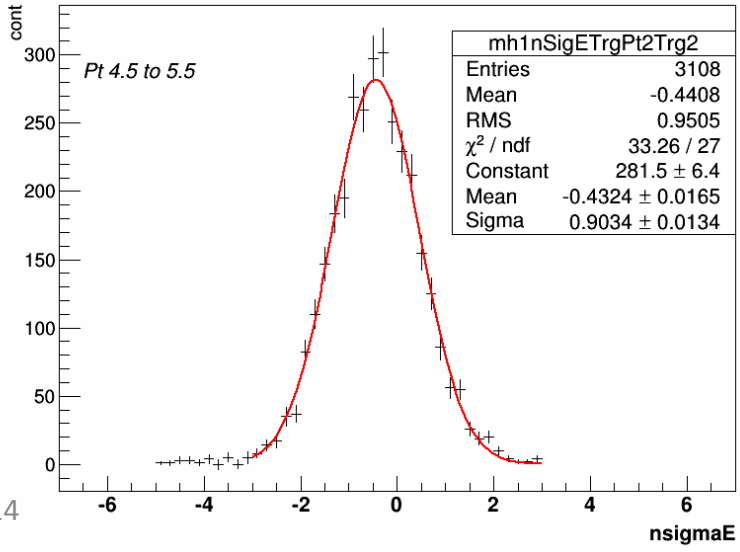
Outline

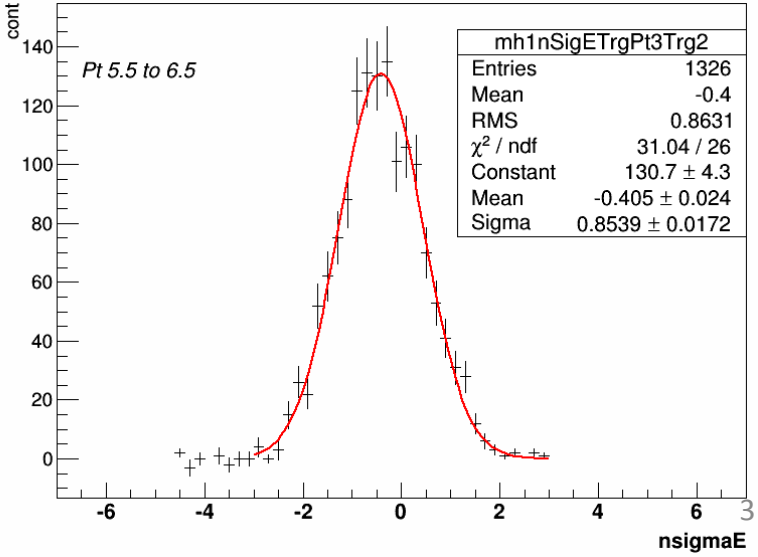
- nsigmaElectron cut efficiency
- The calibration of the electron from the photonic electron
- Calculate the purity of the inclusive electron and uncertainty
- EMC cut efficiency

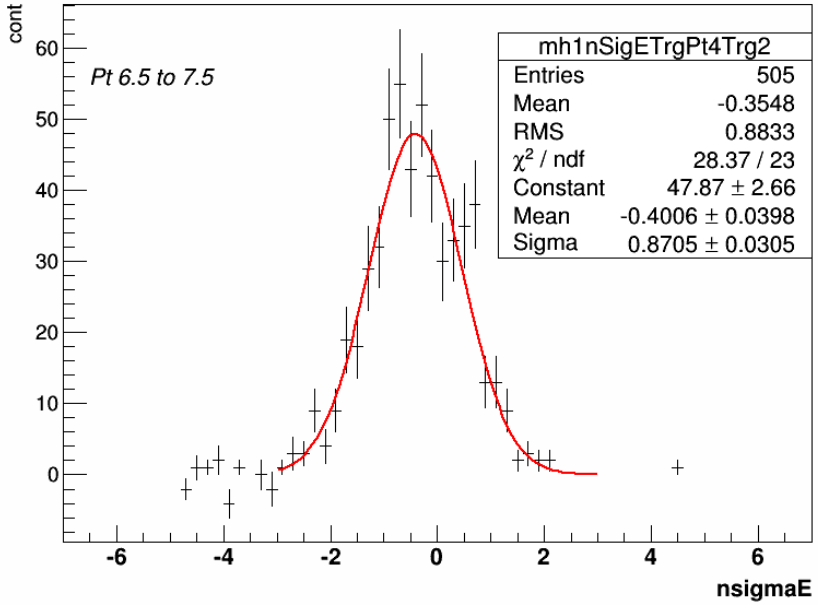
The gaussion fit of the photo electron in different Pt bin

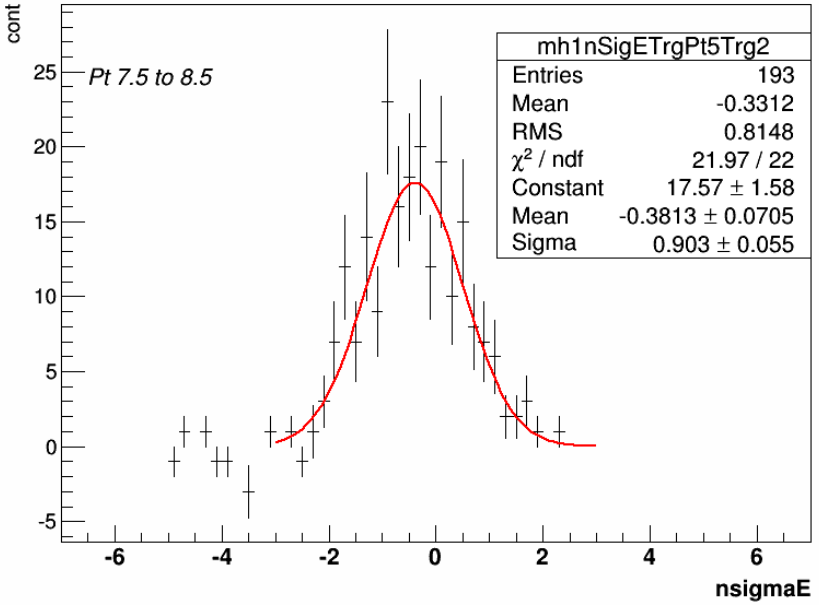


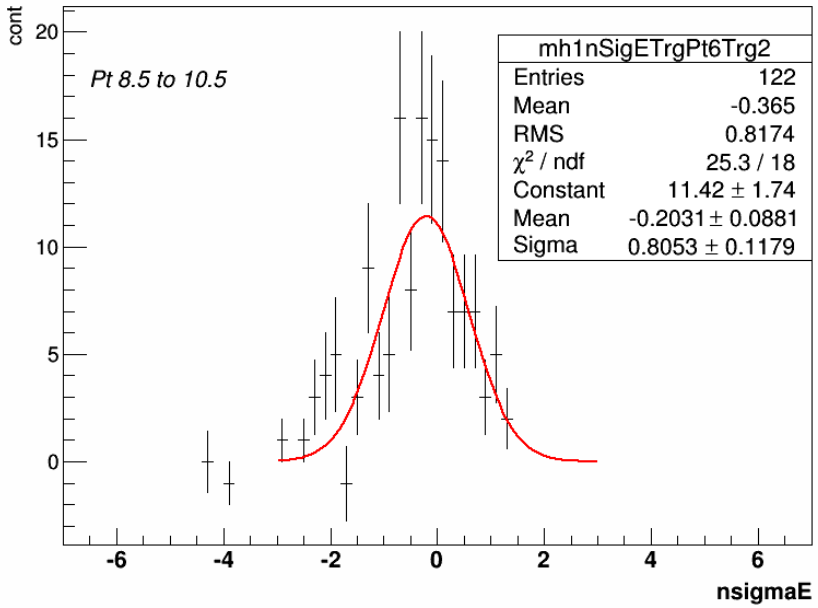


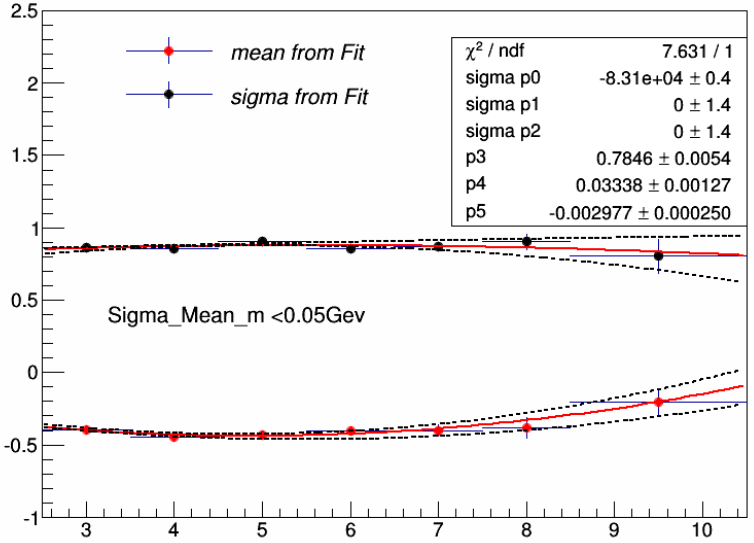




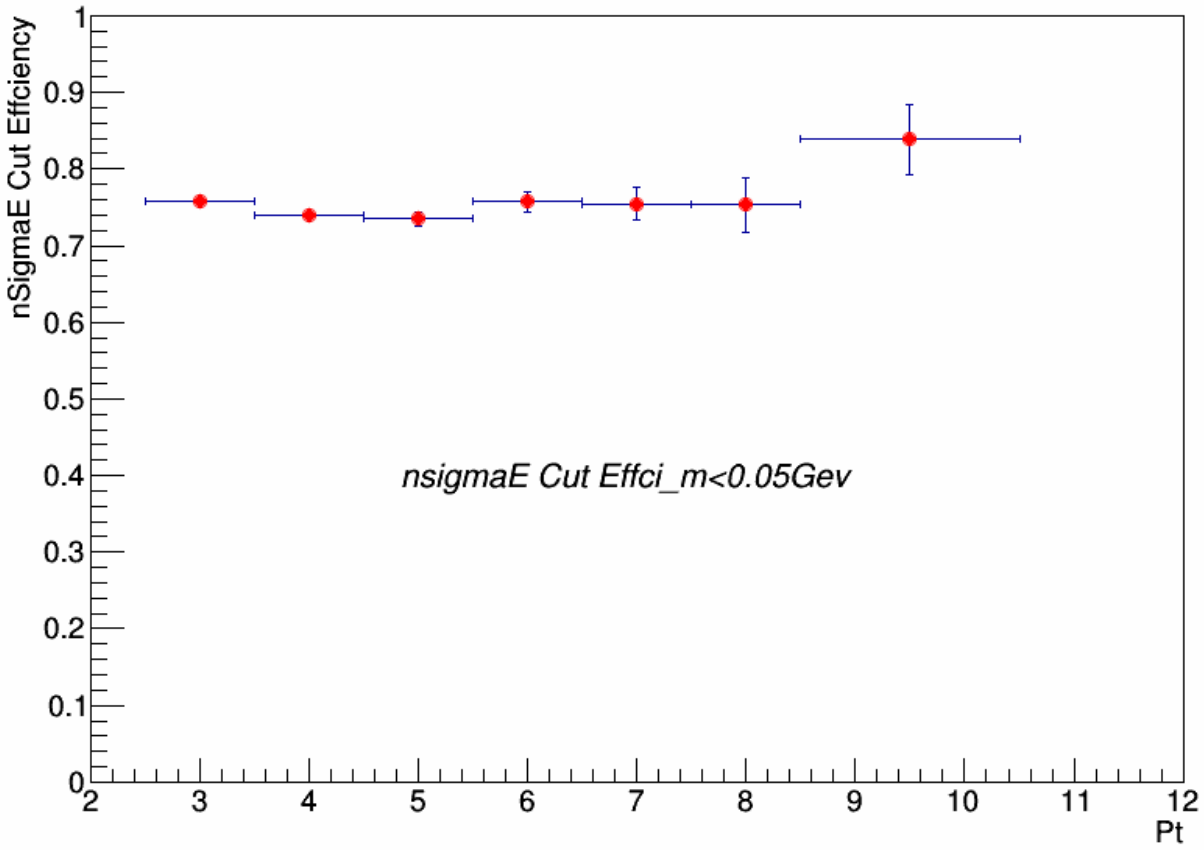

cont
Pt 6.5 to 7.5
mh1nSigETrgPt4Trg2
Entries 505
Mean -0.3548
RMS 0.8833
χ² / ndf 28.37 / 23
Constant 47.87 ± 2.66
Mean -0.4006 ± 0.0398
Sigma 0.8705 ± 0.0305
nsigmaE


cont
Pt 7.5 to 8.5
mh1nSigETrgPt5Trg2
Entries 193
Mean -0.3312
RMS 0.8148
χ² / ndf 21.97 / 22
Constant 17.57 ± 1.58
Mean -0.3813 ± 0.0705
Sigma 0.903 ± 0.055
nsigmaE


cont
Pt 8.5 to 10.5
mh1nSigETrgPt6Trg2
Entries 122
Mean -0.365
RMS 0.8174
χ² / ndf 25.3 / 18
Constant 11.42 ± 1.74
Mean -0.2031 ± 0.0881
Sigma 0.8053 ± 0.1179
nsigmaE

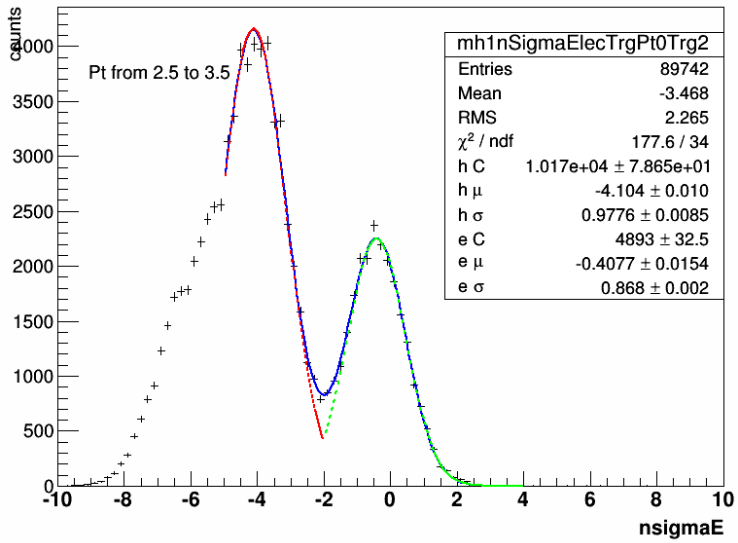

mean from Fit
sigma from Fit
χ² / ndf 7.631 / 1
sigma p0 -8.31e+04 ± 0.4
sigma p1 0 ± 1.4
sigma p2 0 ± 1.4
p3 0.7846 ± 0.0054
p4 0.03338 ± 0.00127
p5 -0.002977 ± 0.000250
Sigma_Mean_m <0.05Gev

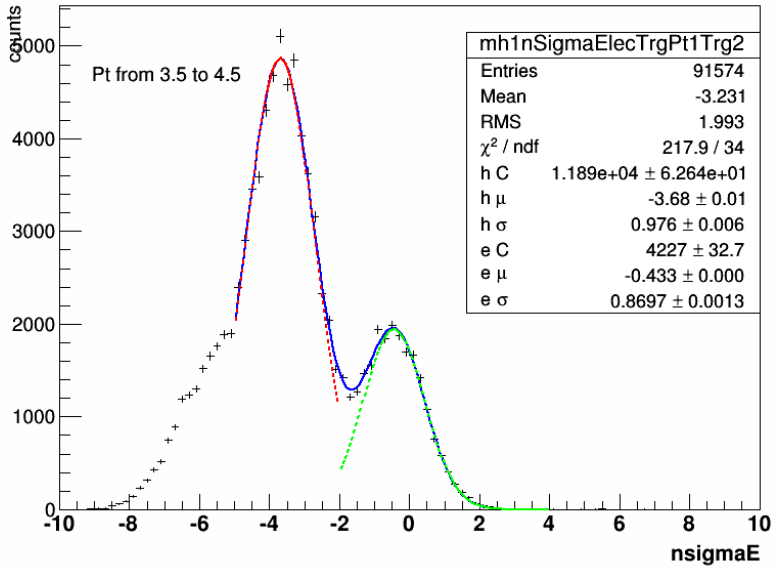
nsigmaElectron cut efficiency (-1<nsigmaE<3)



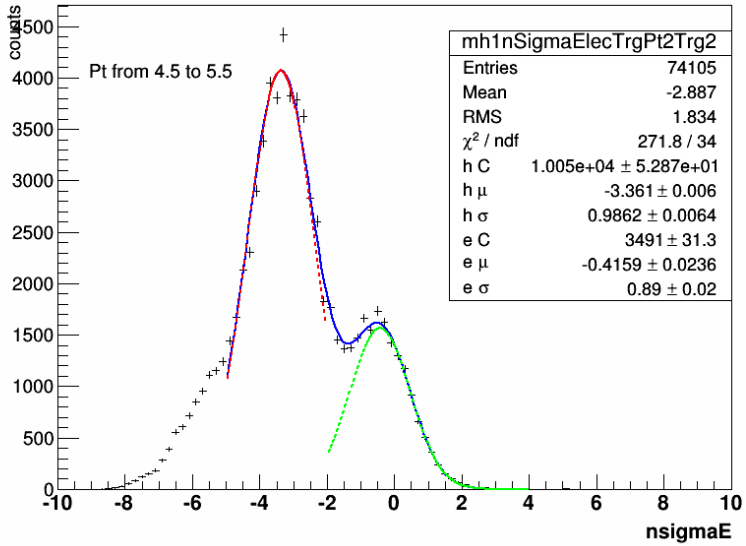
The purity of the inclusive electron

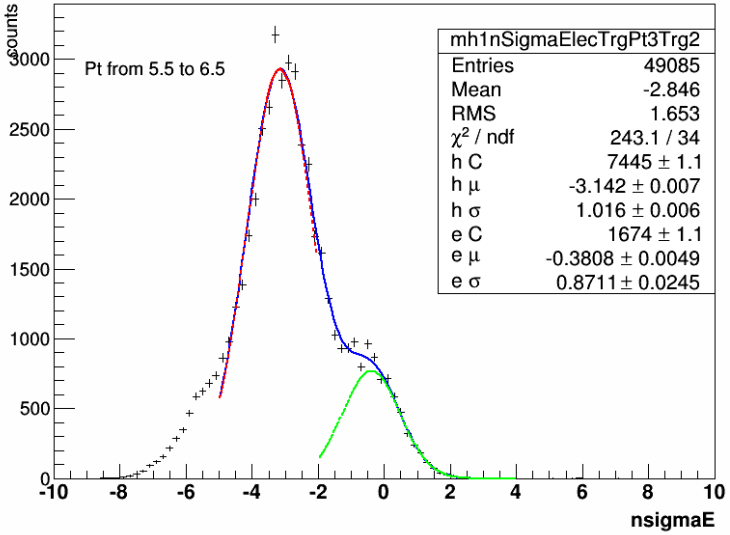
Inclusive electron sample the paon and koan and proton are included , but we don't have the calibration of the hadron. There are two Gaussion fit ,one is for hadron and the other is for the electron

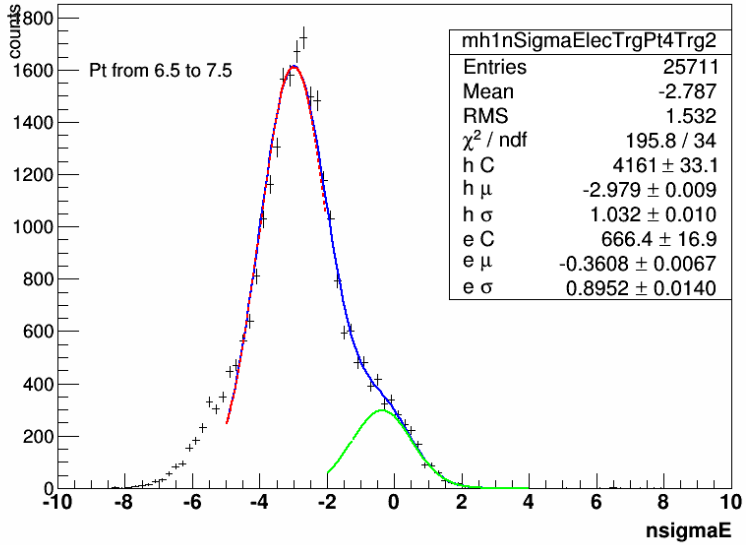


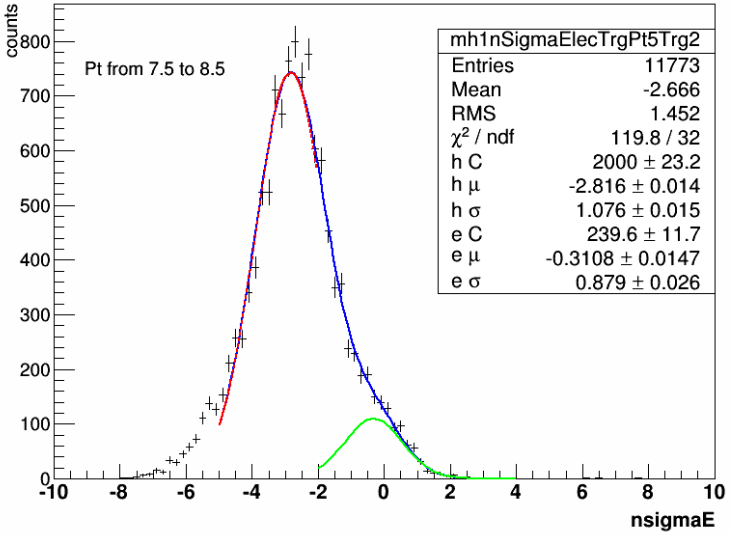


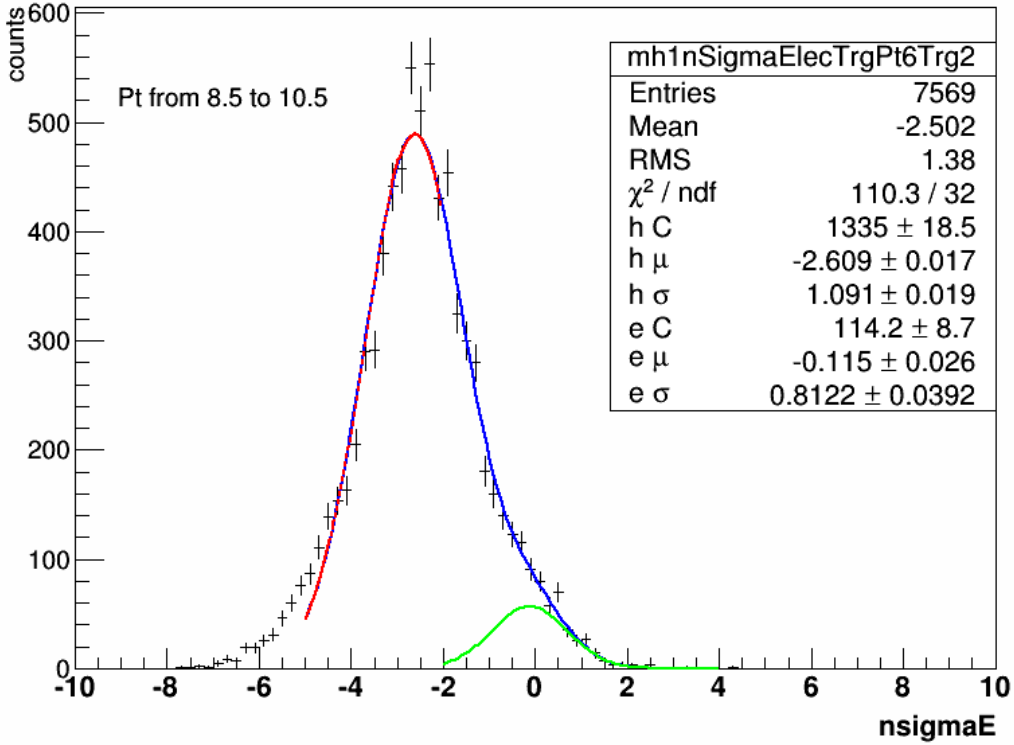
Red: hadron Blue: Inclusive electron Green: electron


Pt from 4.5 to 5.5
mh1nSigmaElecTrgPt2Trg2
Entries 74105
Mean -2.887
RMS 1.834
χ² / ndf 271.8 / 34
h C 1.005e+04 ± 5.287e+01
h μ -3.361 ± 0.006
h σ 0.9862 ± 0.0064
e C 3491 ± 31.3
e μ -0.4159 ± 0.0236
e σ 0.89 ± 0.02
counts
nsigmaE

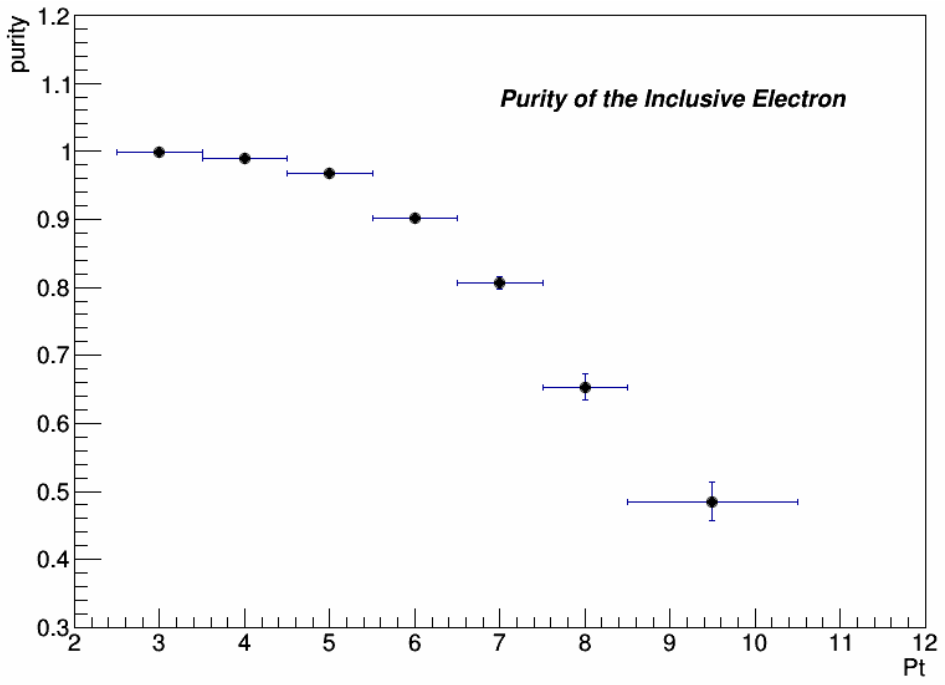

Pt from 5.5 to 6.5
mh1nSigmaElecTrgPt3Trg2
Entries 49085
Mean -2.846
RMS 1.653
χ² / ndf 243.1 / 34
h C 7445 ± 1.1
h μ -3.142 ± 0.007
h σ 1.016 ± 0.006
e C 1674 ± 1.1
e μ -0.3808 ± 0.0049
e σ 0.8711 ± 0.0245
counts
nsigmaE


Pt from 6.5 to 7.5
mh1nSigmaElecTrgPt4Trg2
Entries 25711
Mean -2.787
RMS 1.532
χ² / ndf 195.8 / 34
h C 4161 ± 33.1
h μ -2.979 ± 0.009
h σ 1.032 ± 0.010
e C 666.4 ± 16.9
e μ -0.3608 ± 0.0067
e σ 0.8952 ± 0.0140
counts
nsigmaE


Pt from 7.5 to 8.5
mh1nSigmaElecTrgPt5Trg2
Entries 11773
Mean -2.666
RMS 1.452
χ² / ndf 119.8 / 32
h C 2000 ± 23.2
h μ -2.816 ± 0.014
h σ 1.076 ± 0.015
e C 239.6 ± 11.7
e μ -0.3108 ± 0.0147
e σ 0.879 ± 0.026
counts
nsigmaE

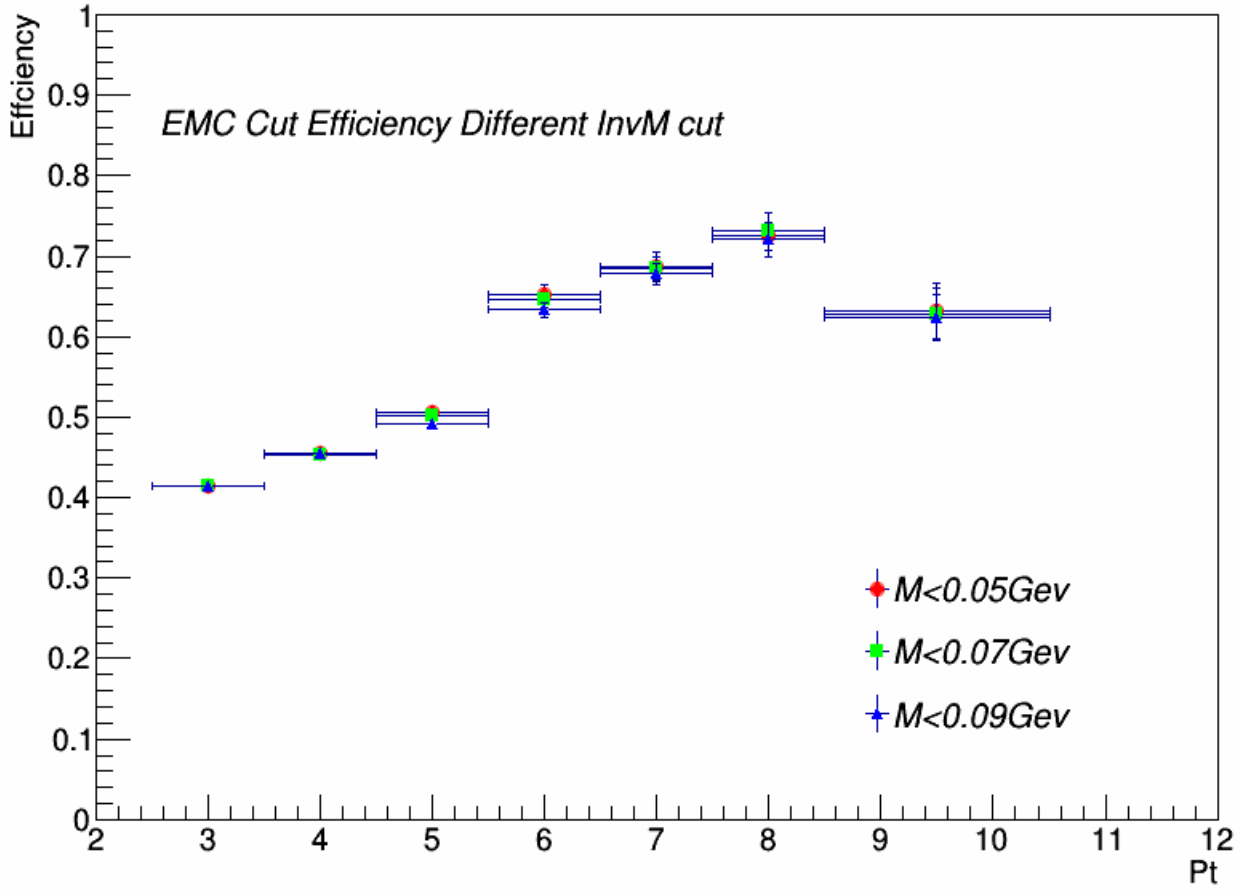

counts
Pt from 8.5 to 10.5
mh1nSigmaElecTrgPt6Trg2
Entries 7569
Mean -2.502
RMS 1.38
χ² / ndf 110.3 / 32
h C 1335 ± 18.5
h μ -2.609 ± 0.017
h σ 1.091 ± 0.019
e C 114.2 ± 8.7
e μ -0.115 ± 0.026
e σ 0.8122 ± 0.0392
nsigmaE

The purity of the inclusive electron in different pt bin （one sigma constrain ）

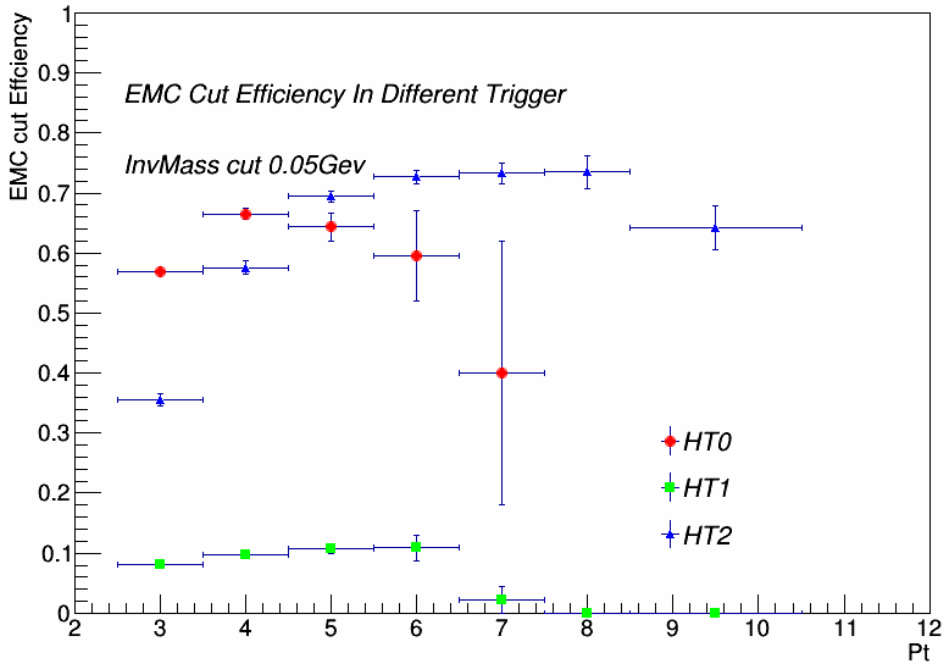


The purity and systematic uncertainty

EMC cut efficiency in different InvMass cut



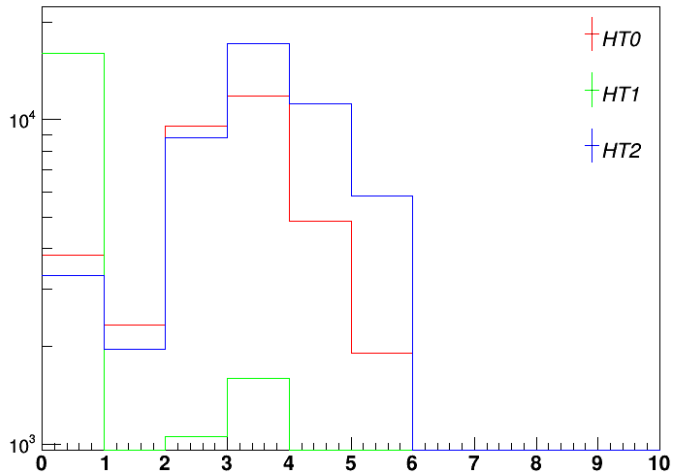
EMC Cut Efficiency In Different Trigger



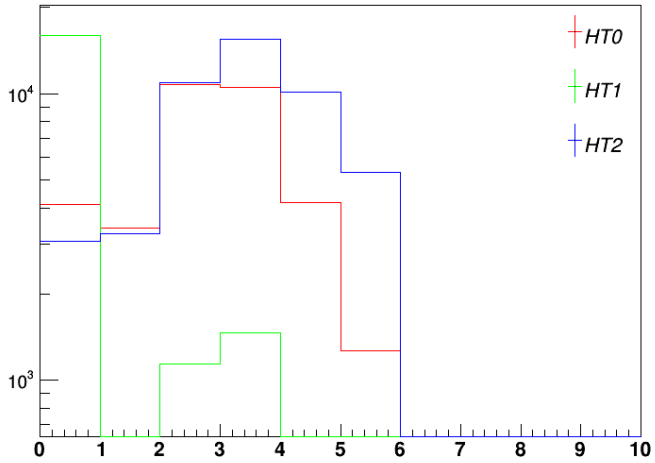
Why the HT1 EMC cut efficiency is lower than HT0 and HT2?(because of the Neta>1 && Nphi>1) The study of this problem is on going

NEta and NPhi distribution

(All the ePID cuts applied except Neta && NPhi)



NETa



NPhi

Thanks

Track Quality Cuts and eID Cuts

- Track quality cuts:
  nhits>20 && nhits/nhist_poss >0.52
  && nhitsDedx >15 && gDCA<1.5 && first_pointR <73

- eID Cuts

pMom> 0.2 && |eta|<1.0 && nEta >1 && nPhi>1
&& ((HT0BBCMBToF0 && ADC> 11) || (HT1BBCMBTof0 && ADC>15) || (TH2BBCMB && ADC >18))
&& 0.3<poe0<1.5 &&|Dz|<3 &&|Dphi| <0.015 &&-1<nσe<3

- Partner cuts:
  |nσe_partner|<5 && gMom>0.2

- Pair Cuts:
  M_{ee} <0.3 && pairDCA<1.0