MC Single e Studies
(TMB root tree)

Processed 1000 single e's (p_T=20 GeV) with p11.11.00 D0Sim + D0reco and t02.31.00 TMBAnalyze.

D0Sim has a single gaussian for calorimeter noise.

Thumbnail files in clued0

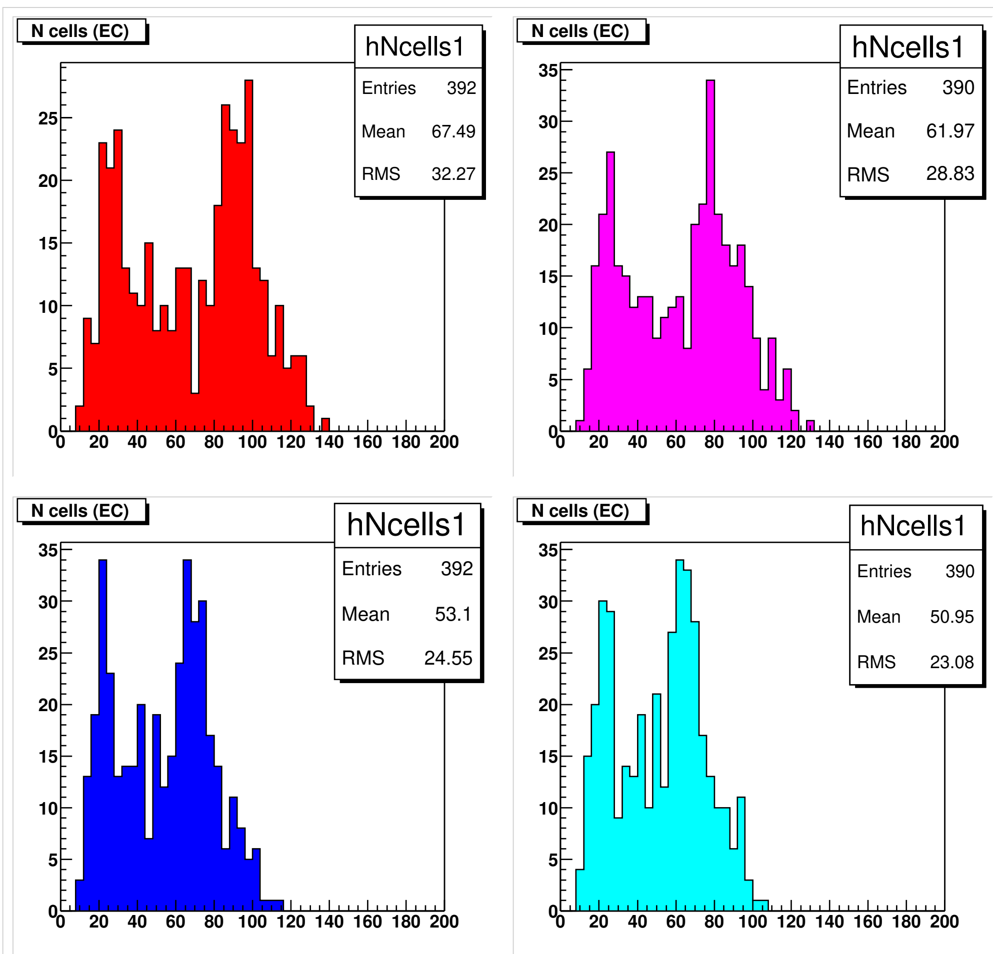
~serban/yaphank/p11_d0reco
~serban/yaphank/root_tree

5 single e files (p11_e_*):
1.5 σ offline cut, cal noise on
1.5 σ offline cut, cal noise off
2.5 σ offline cut, cal noise on
2.5 σ offline cut, cal noise off
non-zero suppressed, cal noise off
(actually has a 0.2 σ cut in D0Sim)

Number of EM cells in EC

These plots were generated using p11.09
threshold cuts are D0Sim (not D0reco)
noise is subtraction of two gaussians
showed for comparison with subsequent plots

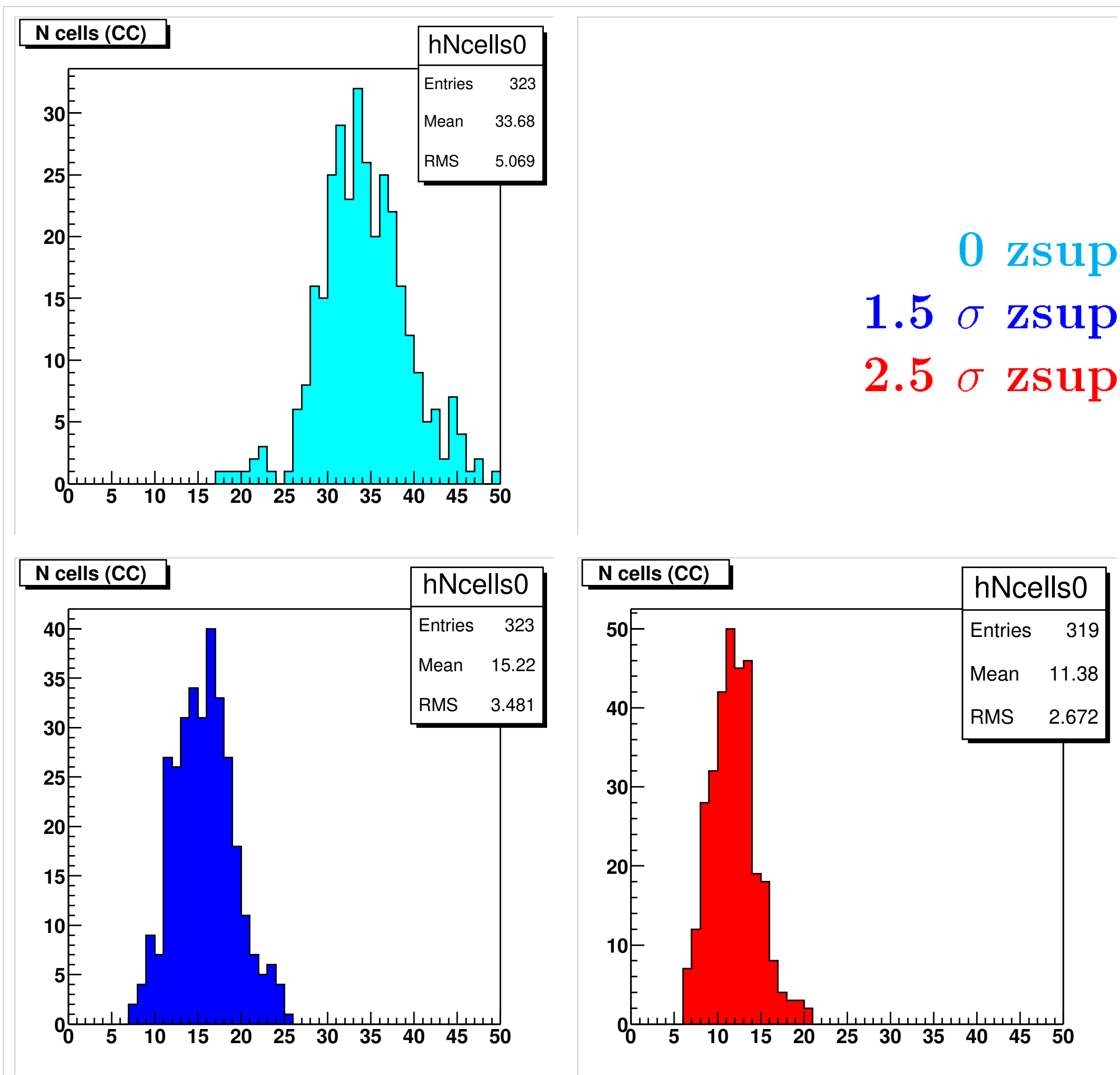
1.5 σ (with noise) 2.5 σ



1.5 σ (no noise) 2.5 σ

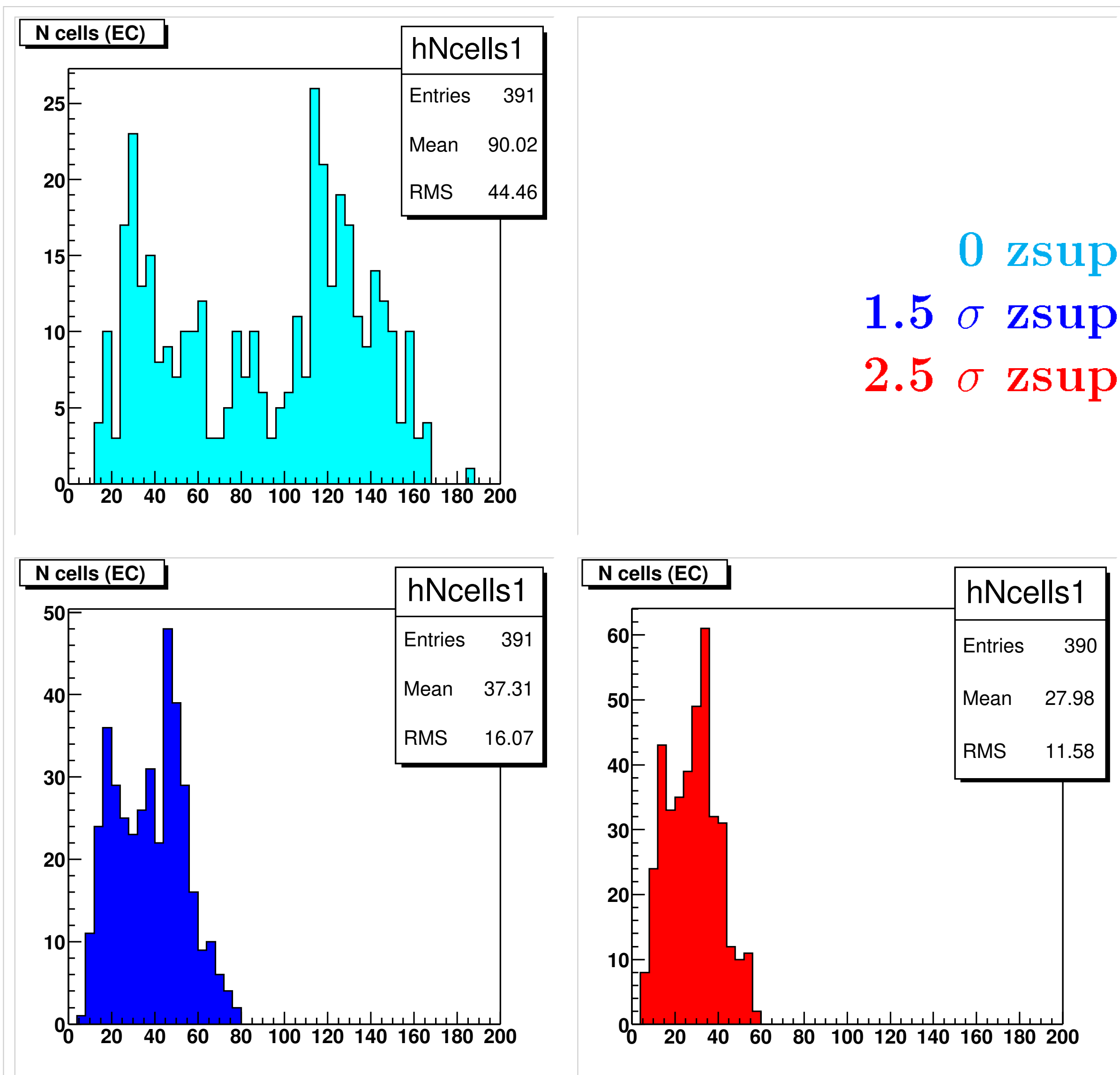
Number of EM cells in CC

(no calorimeter noise)

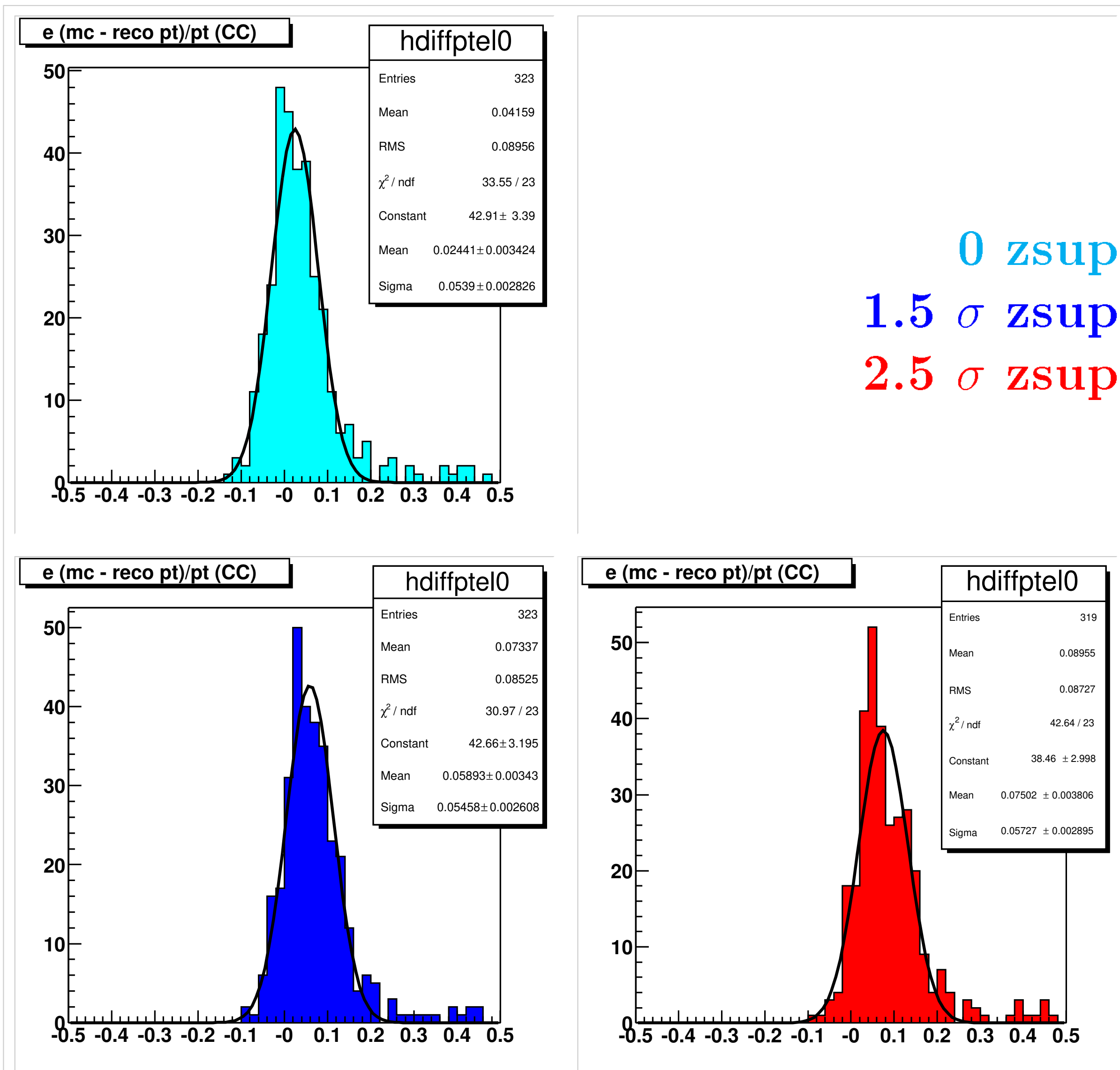


Number of EM cells in EC

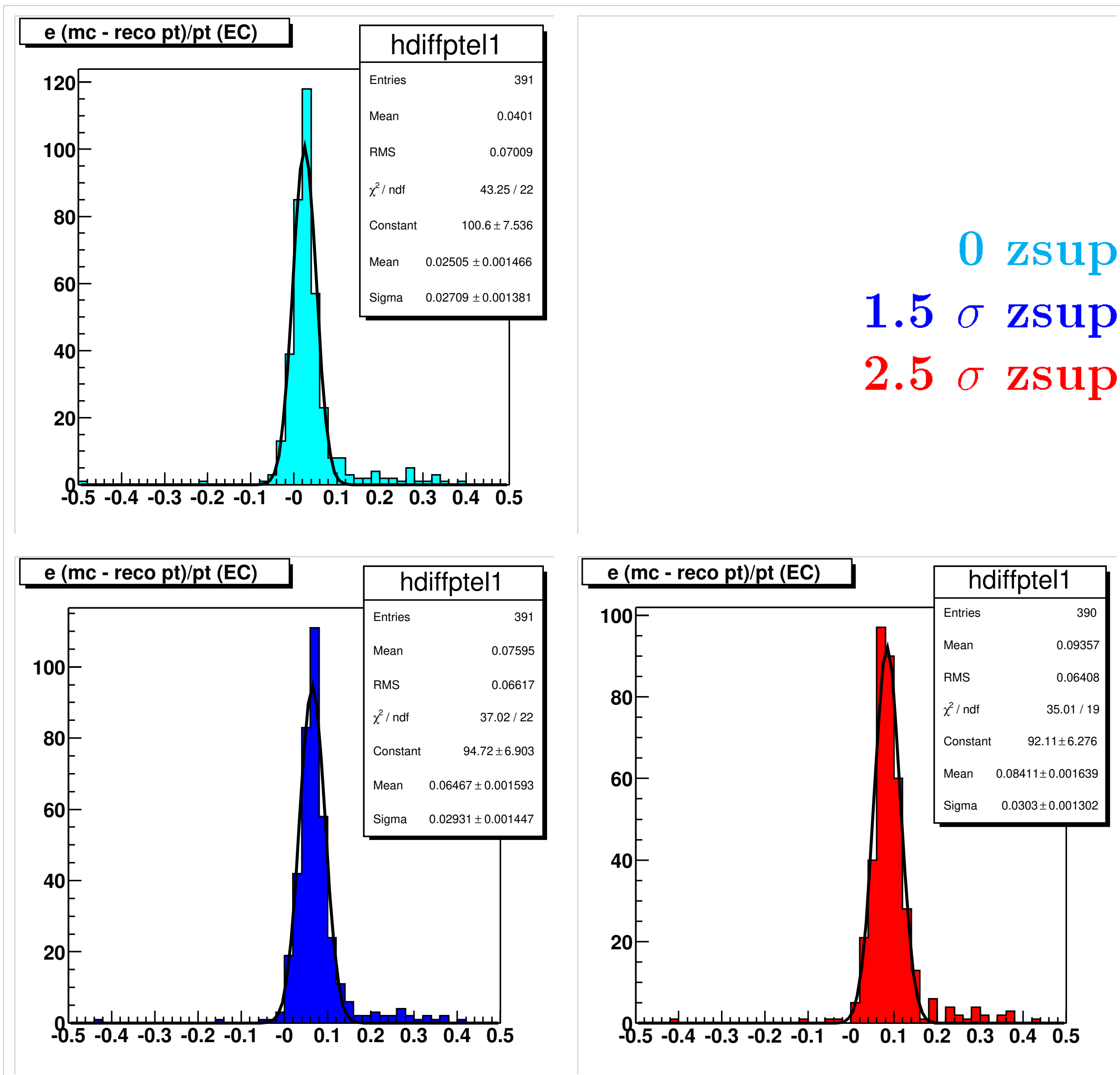
(no calorimeter noise)



$\Delta p_T/p_T$ in CC
(no calorimeter noise)

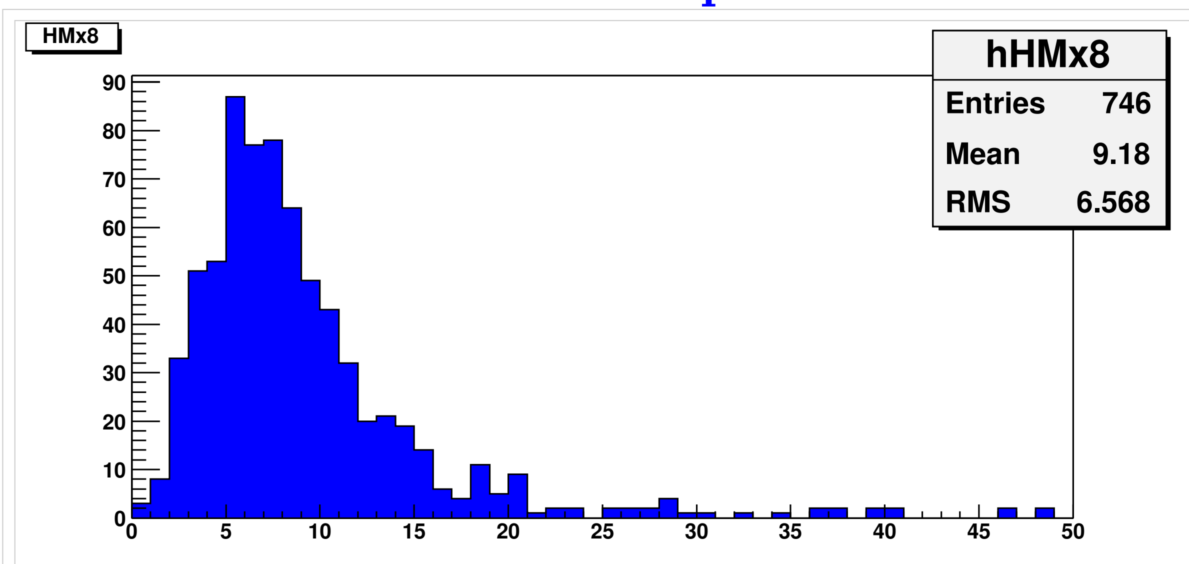


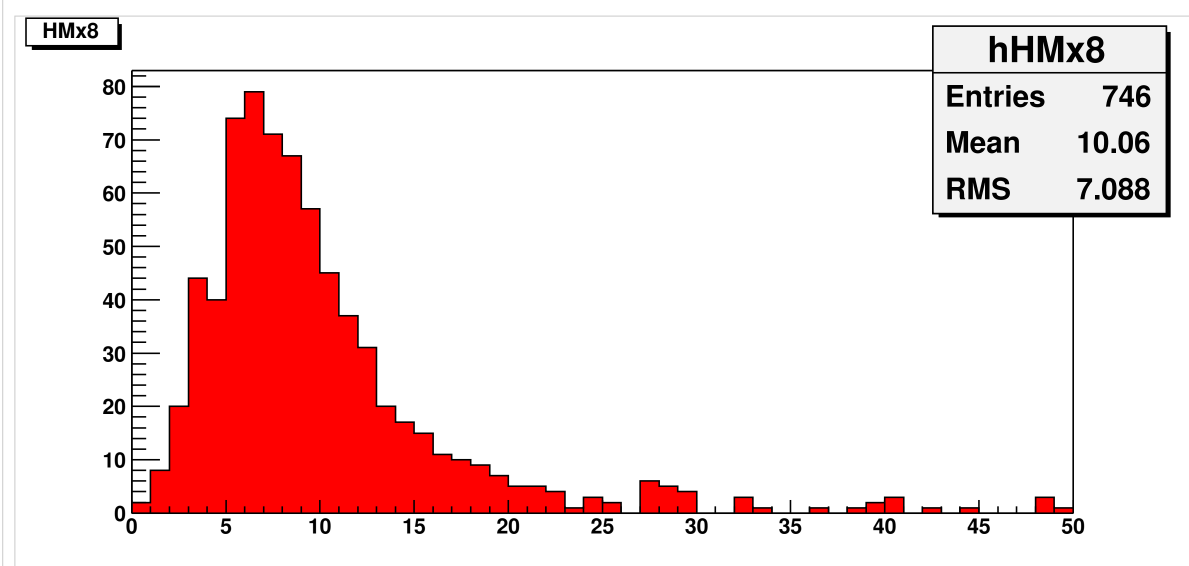
$\Delta p_T/p_T$ in EC
(no calorimeter noise)



HMx8 distribution
(no calorimeter noise)

1.5 σ zsup



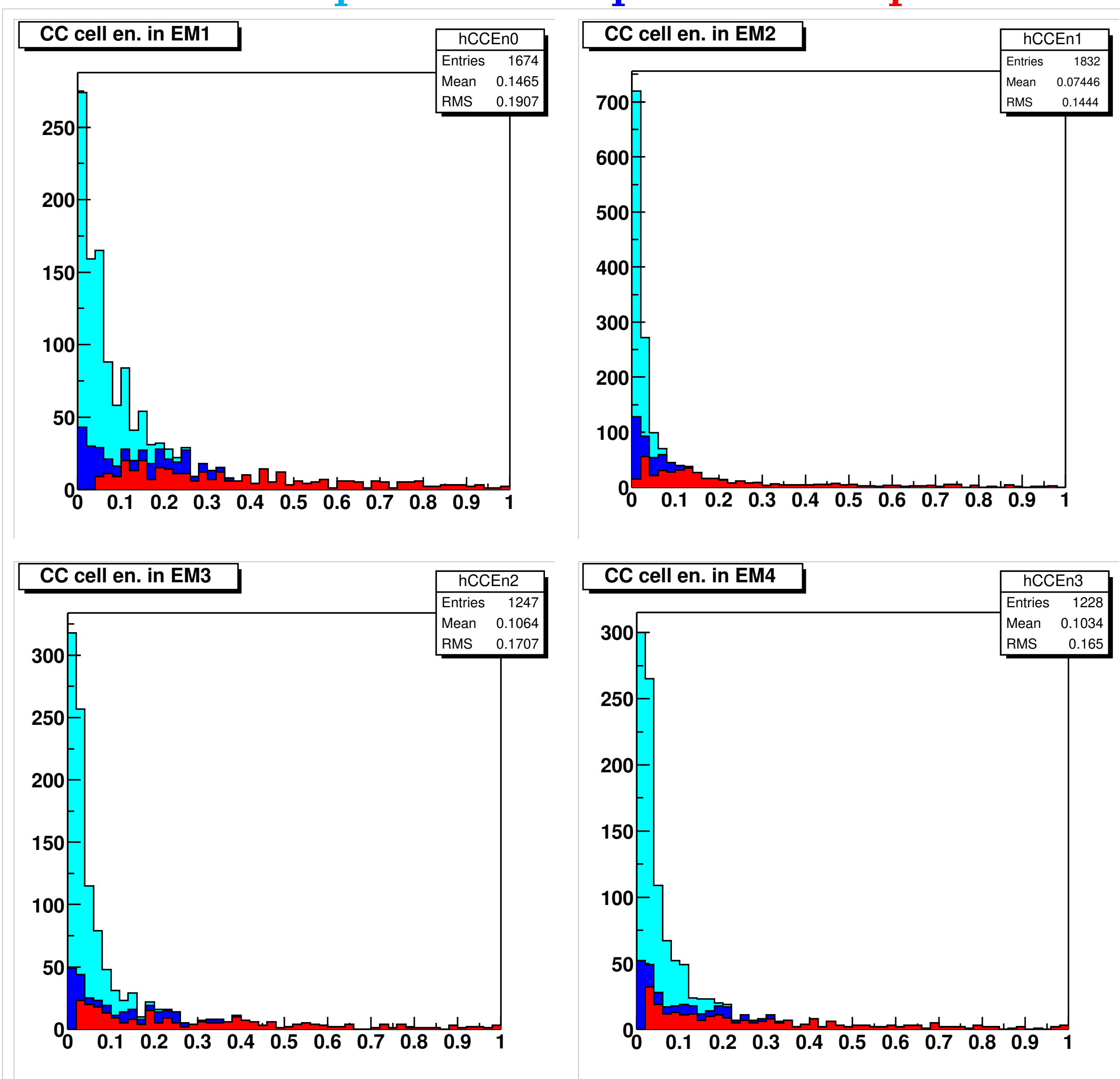


2.5 σ zsup

EM Cell Energy in CC

(no calorimeter noise)

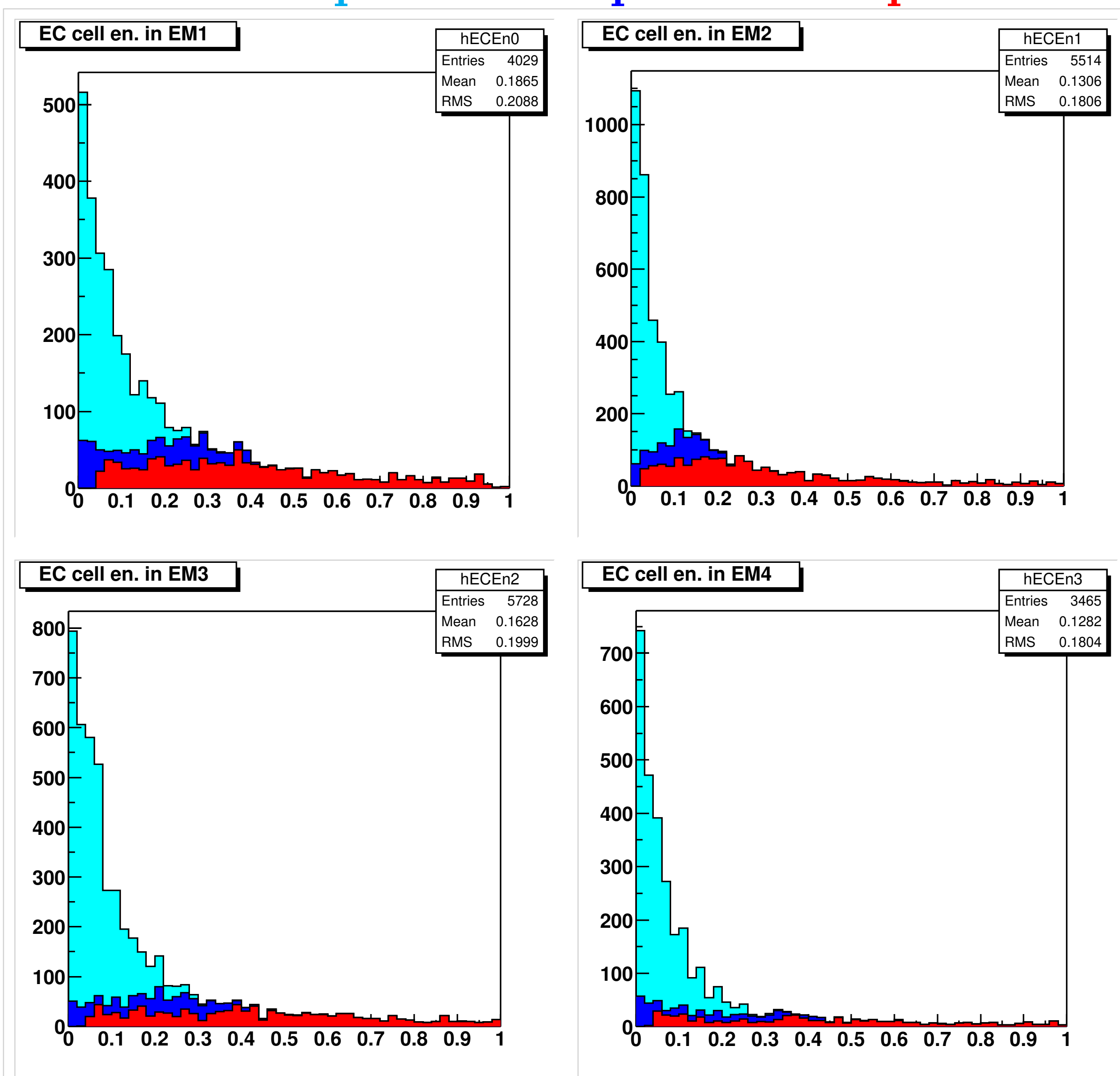
0 zsup 1.5 σ zsup 2.5 σ zsup



EM Cell Energy in EC

(no calorimeter noise)

0 zsup 1.5 σ zsup 2.5 σ zsup

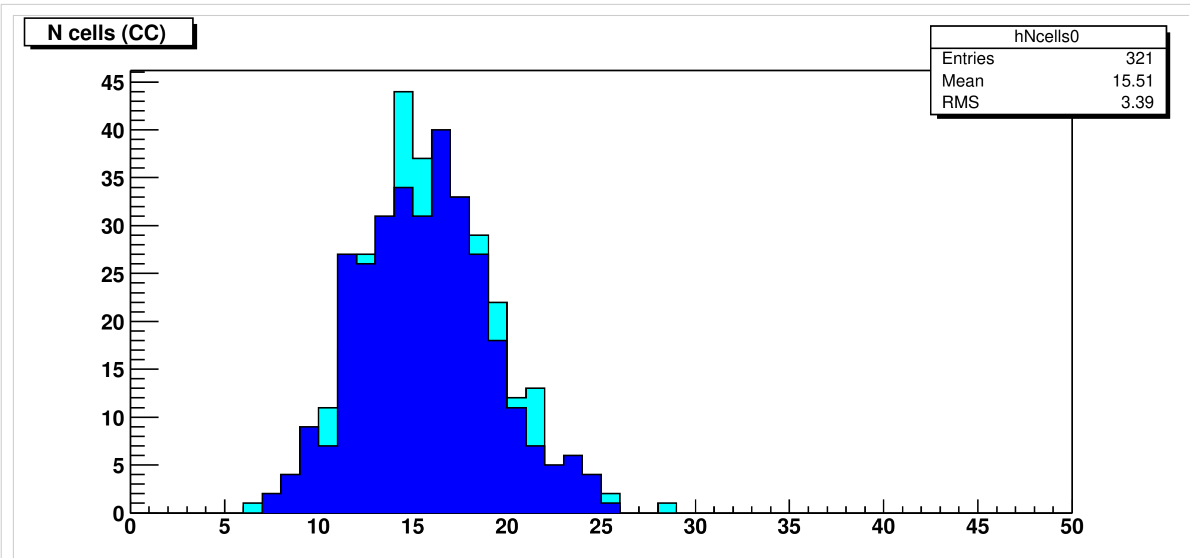


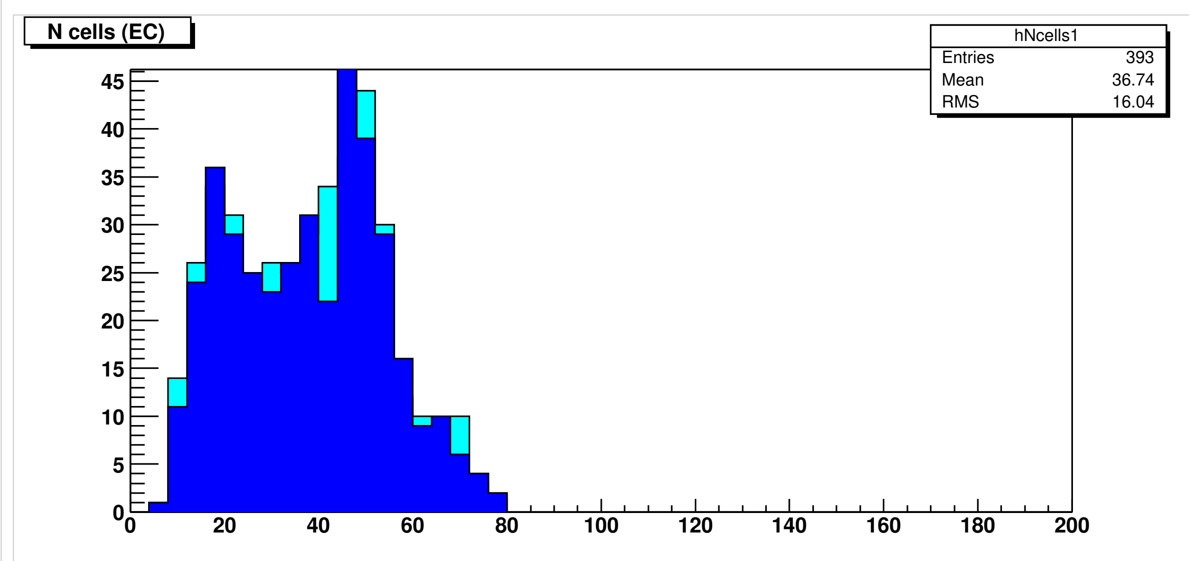
Number of EM cells

(1.5 σ zsup)

with noise

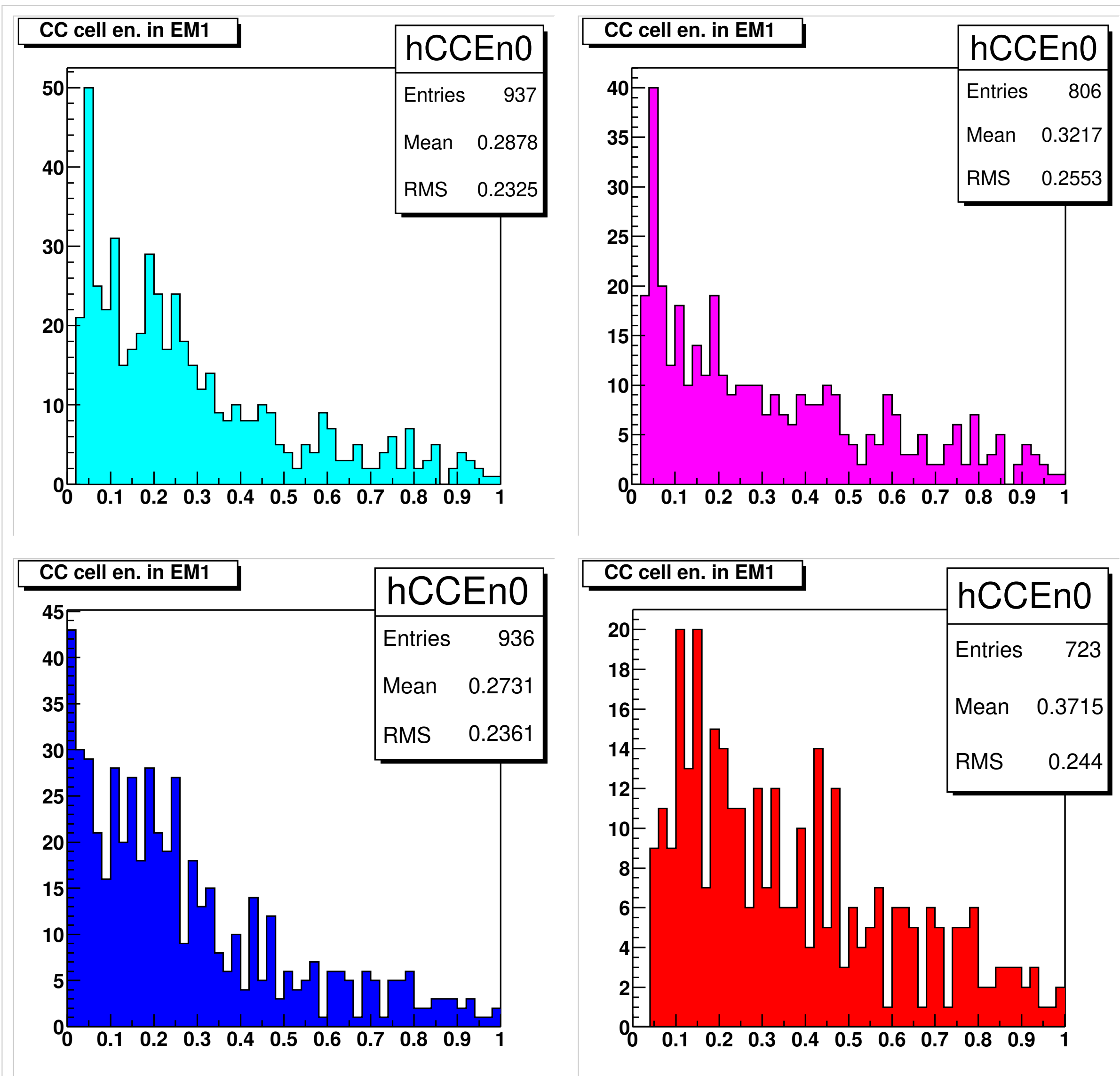
no noise





Cell energy in EM1 CC

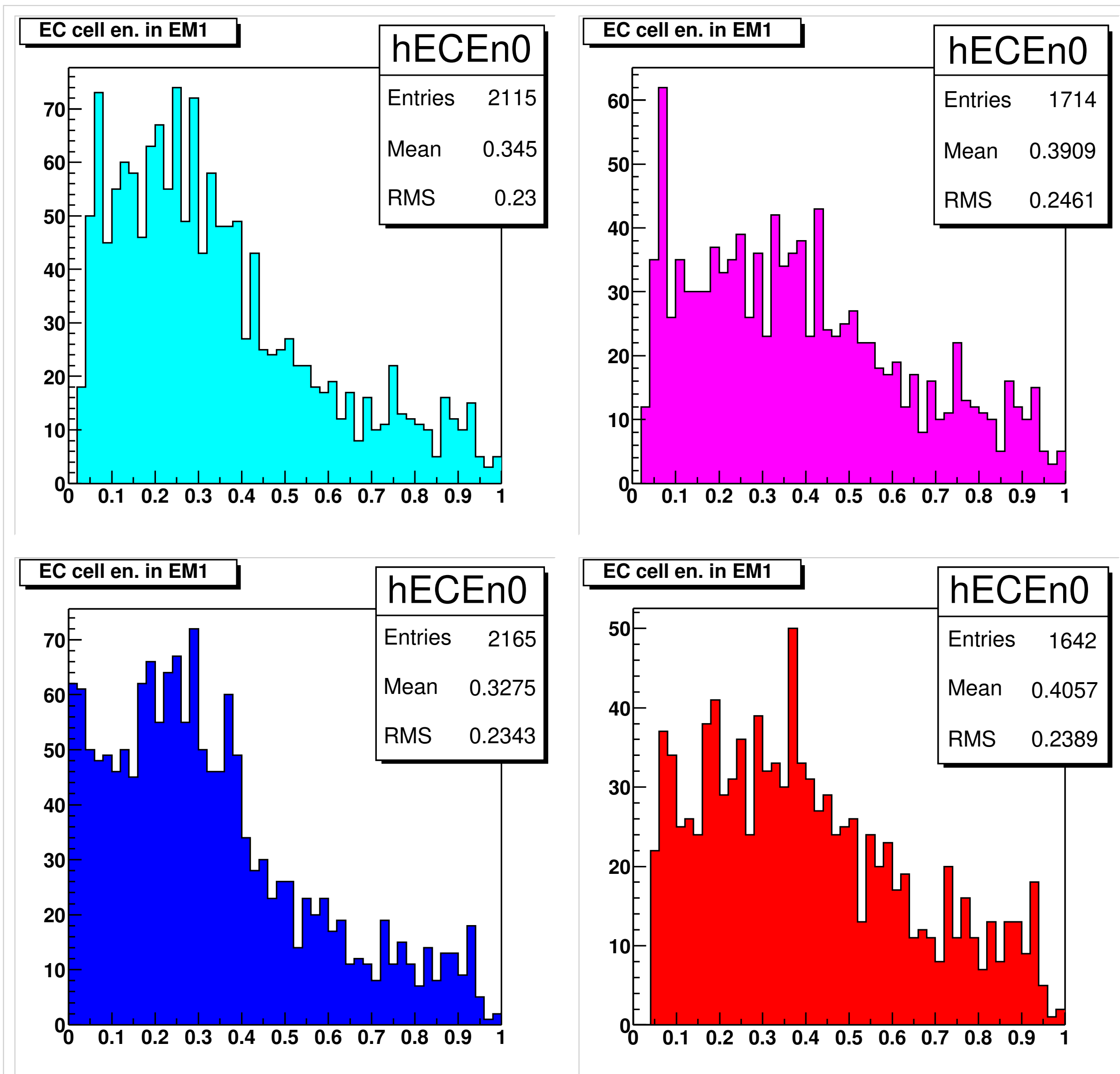
1.5 σ zsup with noise 2.5 σ zsup with noise



1.5 σ zsup no noise 2.5 σ zsup no noise

Cell energy in EM1 EC

1.5 σ zsup with noise 2.5 σ zsup with noise



1.5 σ zsup no noise 2.5 σ zsup no noise

Conclusions

- **Noise generated in pileup package is much softer that the offline σ cuts indicate.**
  No conclusions can be drawn on the effects of noise based on present noise generation
- **Ignoring the effects of noise, raising threshold cut from 1.5 σ to 2.5 σ for 20 GeV p_T electrons:**
  - **Lowers number of cells in CC by 25% and in the EC by 30%**
  - **Lowers the detected p_T by 500 MeV in CC and EC**
  - **Worsens the resolution by 8% in CC, $< 3\%$ in EC**
  - **HMx8 has a longer tail (trained with low cut)**
  - **EM1 layer loses proportionally more energy than the others so at least its sampling fraction should change with changing threshold.**

Sampling fractions for e's probably need retuning given that the threshold cuts in pileup package do not reflect the cuts applied to the data.