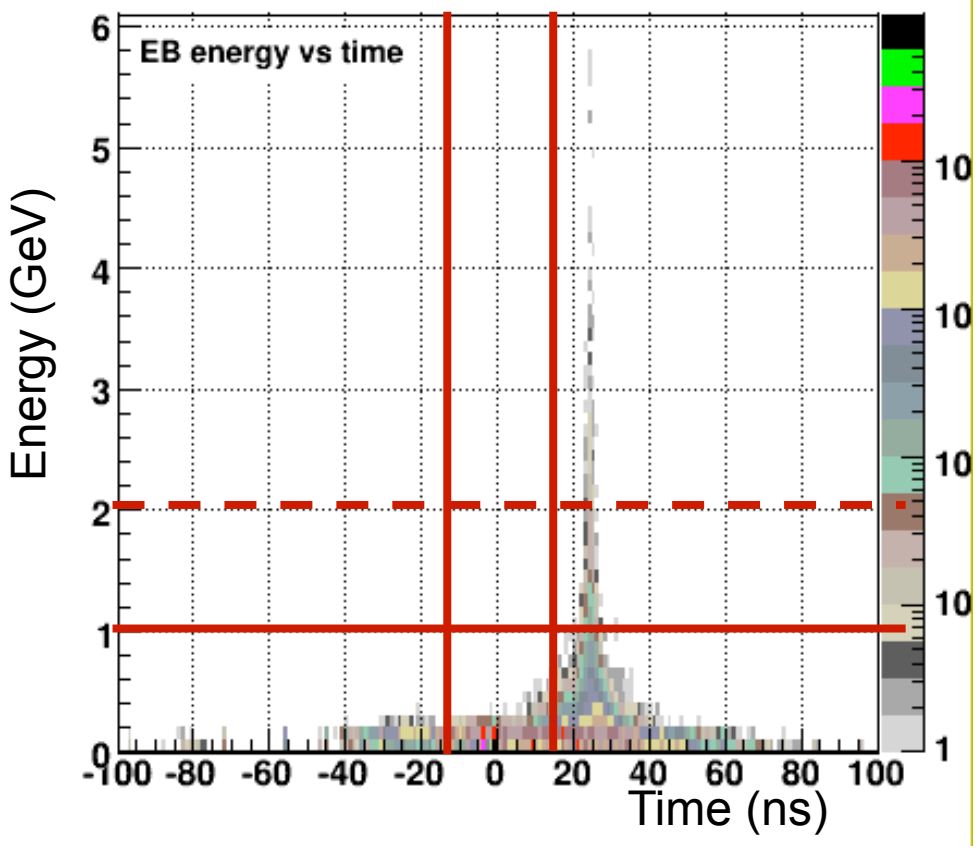
Comparisons of MET distribution for various Out-Of-Time PU samples

- PFMet in Ecal
- PFMet (total)
- CaloMet in Ecal Barrel
- For each, studied – 0 ns (In time pile up)
  - 25 ns Early/Late,
  - 50 ns Early/Late samples

Suvadeep Bose (UNL)

Dedicated OOT Pile Up Samples

Mike has produced dedicated OOT samples.
Each file has 1000 events with a fixed 5 interactions per bunch crossing overlaid on single neutrino events. The bunch crossing times are shifted with respect to the in-time interaction by an amount specified in the file name.
eg. step2_SingleNu_5interactions_RAW2DIGI_L1Reco_RECO_25nsLate.root



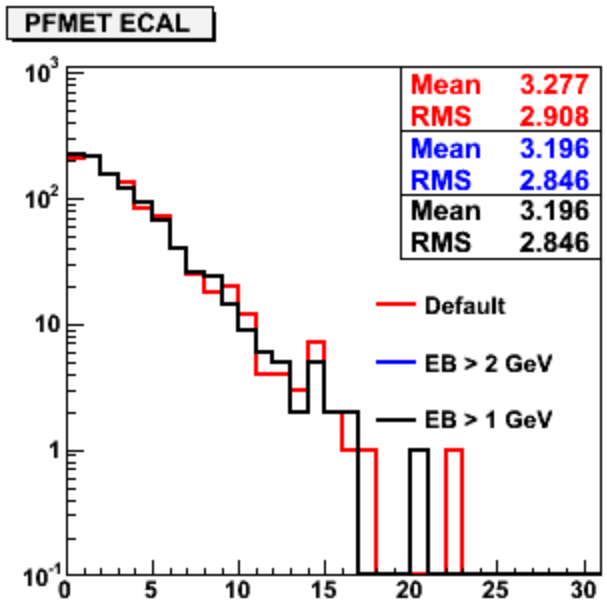
- Looked at the these OOT samples with the timing cut:

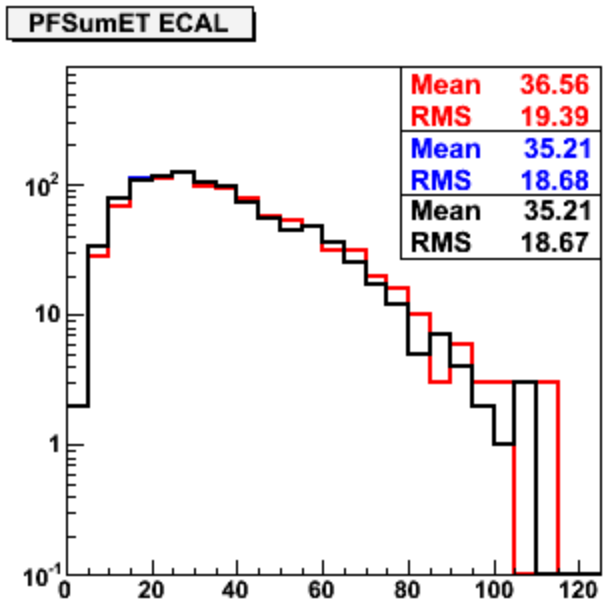
Veto $time_{rec}$ > 15 ns
for EB $energy_{rec}$ **> 2 GeV (1 GeV)**
and EE $energy_{rec}$ > 2 GeV

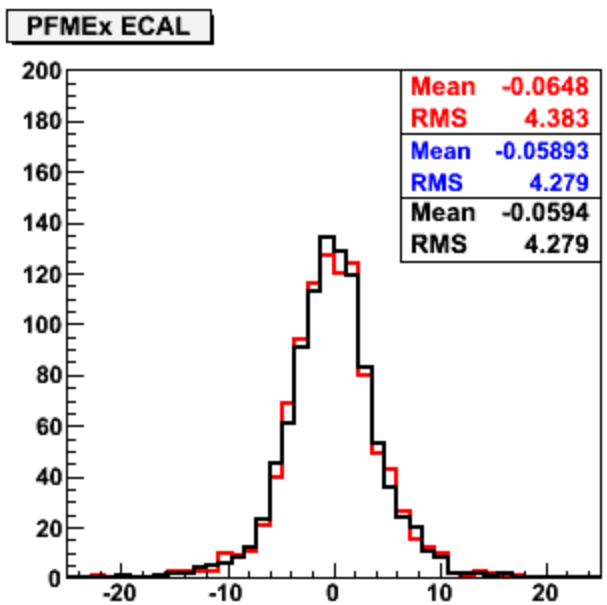
<u>Motivation</u>: We may not expect a significant gain by the timing cut for 50ns bunch crossing data, but probably for 25ns which we will face later.

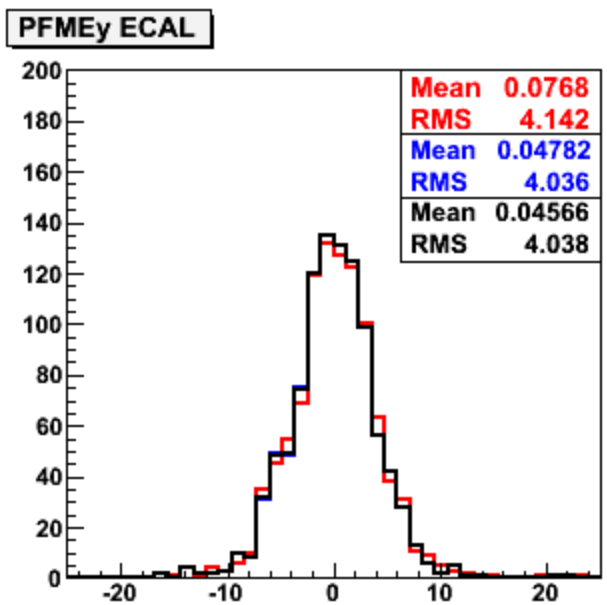
Comparison Plots for 0 ns Early OOT sample (PFlow)

PFMet in ECal



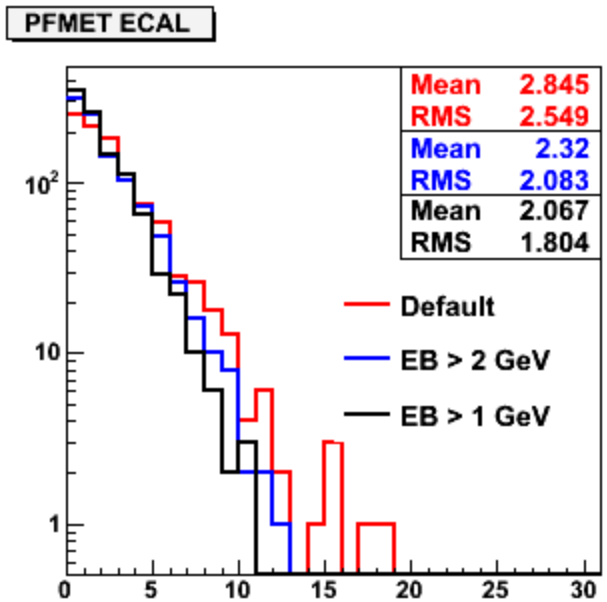


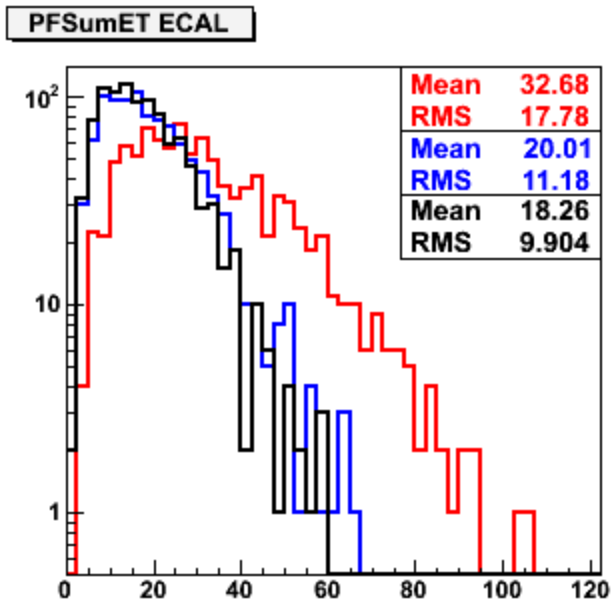


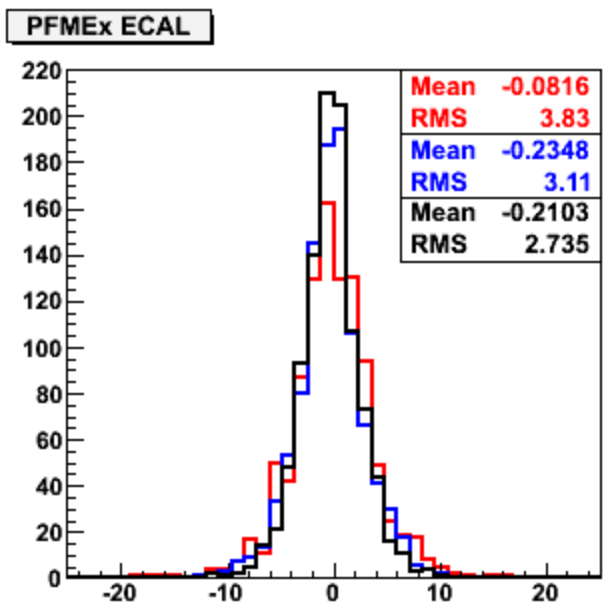


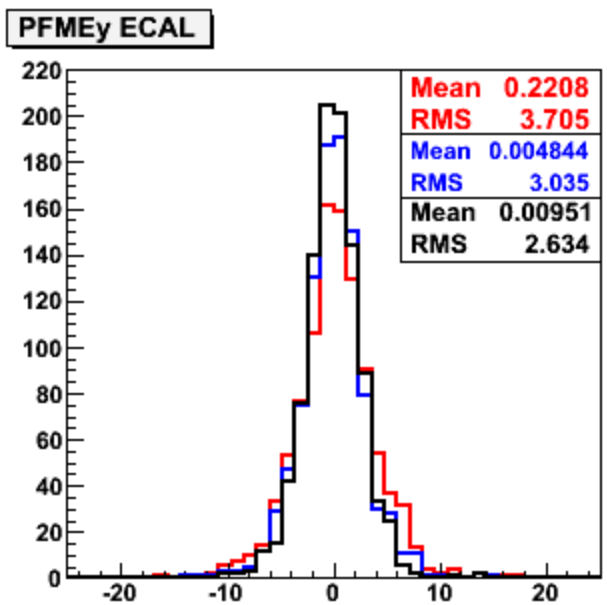
Comparison Plots for 25 ns Early OOT sample (PFlow)

PFMet in ECal



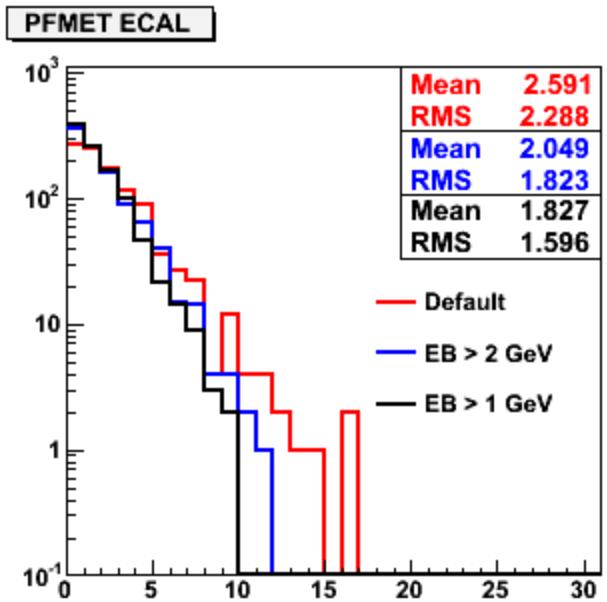


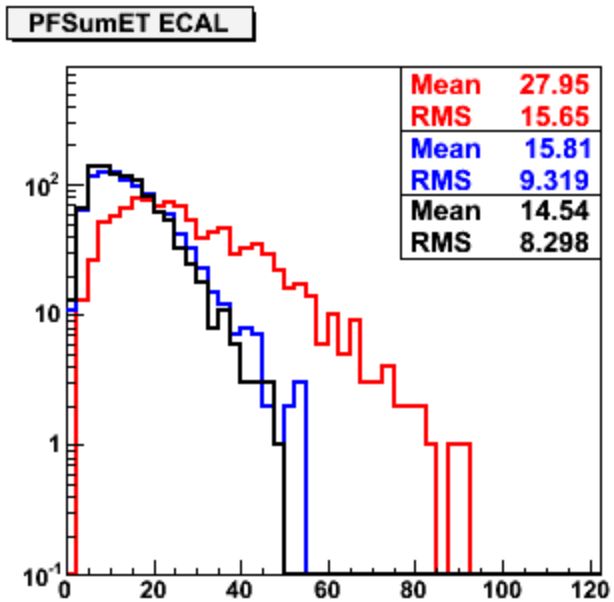


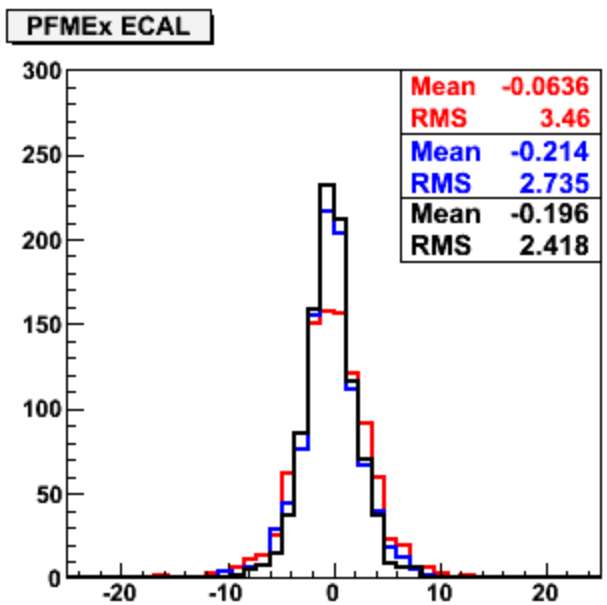


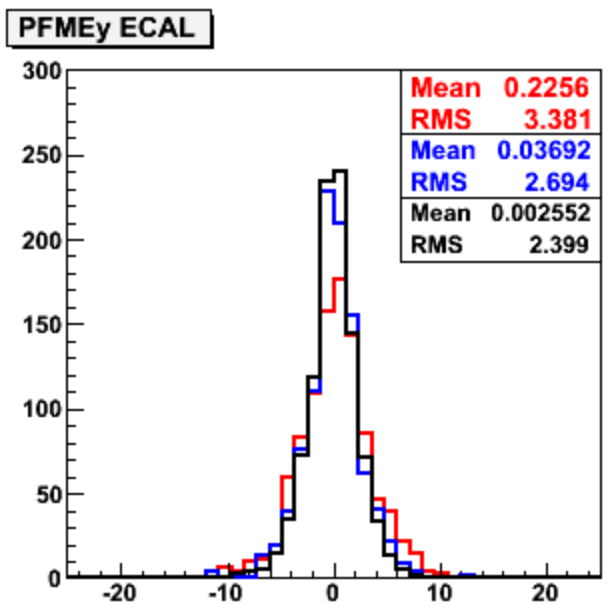
Comparison Plots for 25 ns Late OOT sample (PFlow)

PFMet in ECal



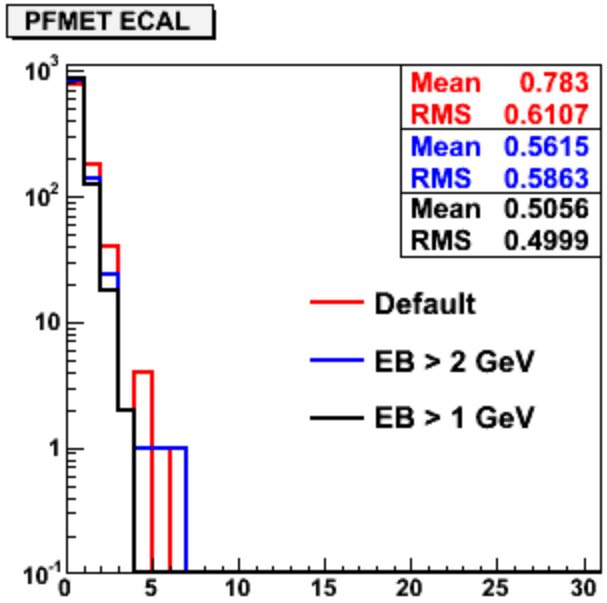


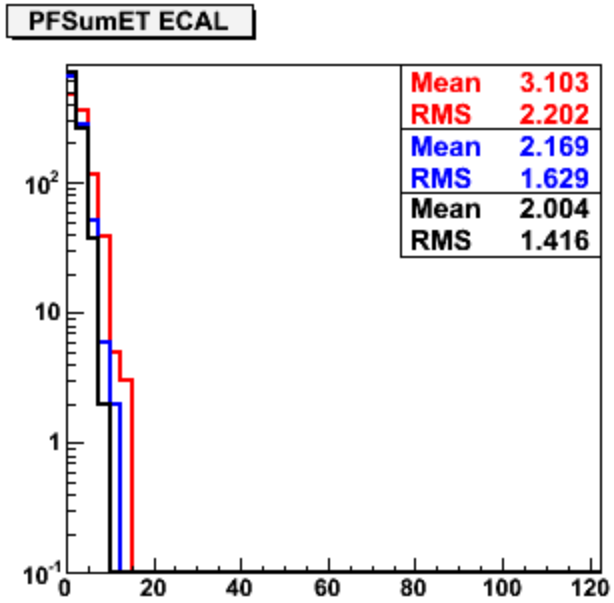


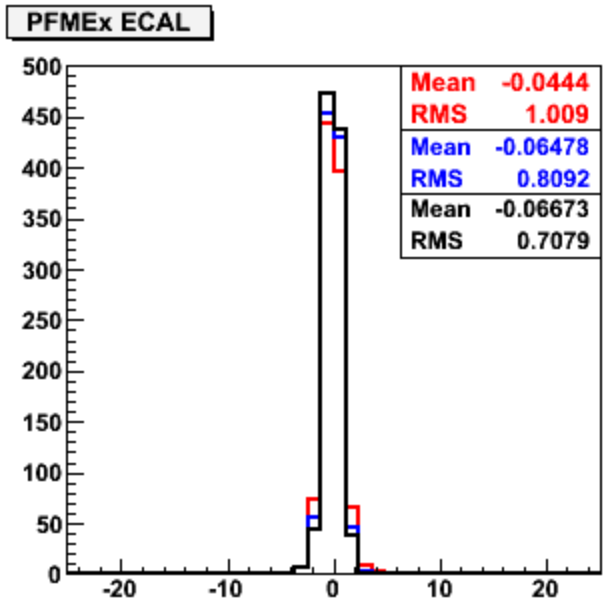


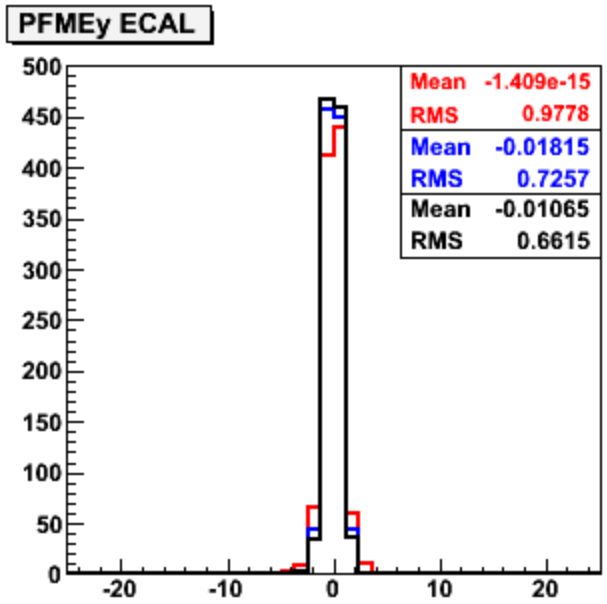
Comparison Plots for 50 ns Early OOT sample (PFlow)

PFMet in ECal



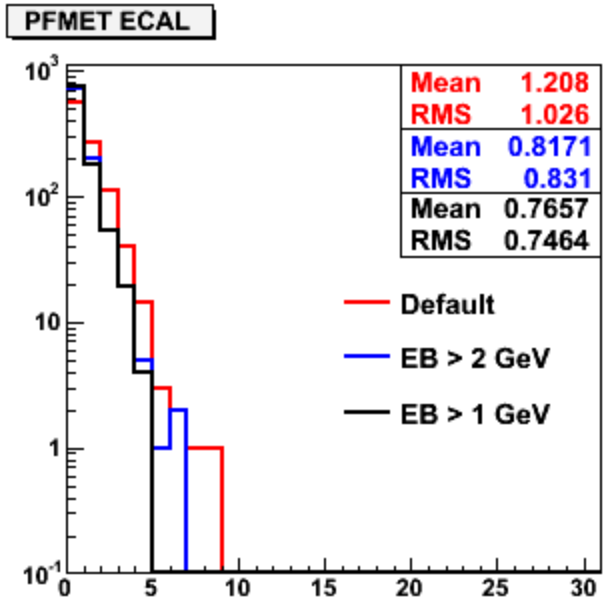


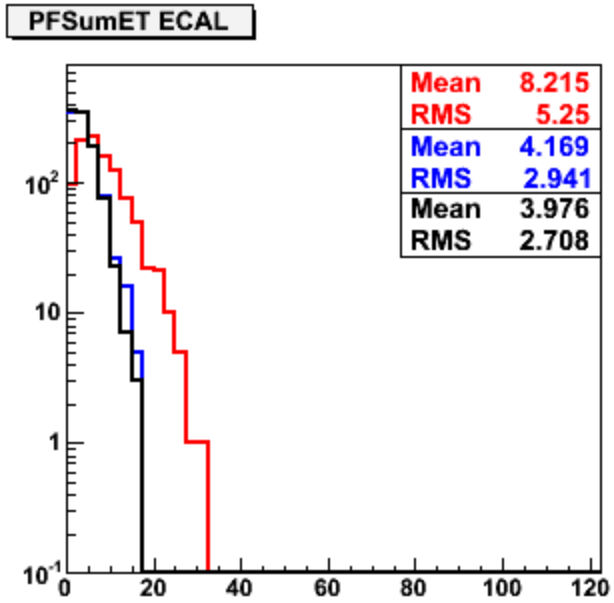


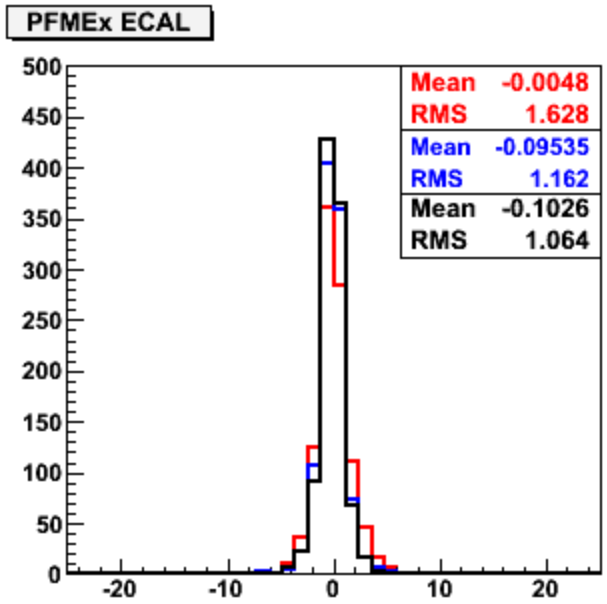


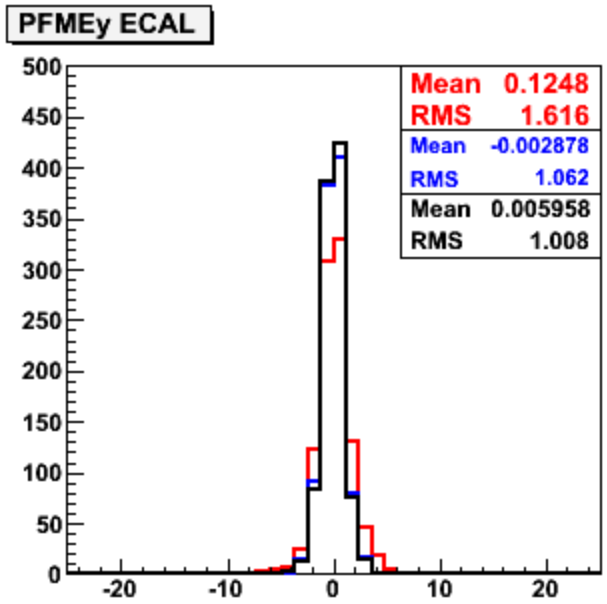
Comparison Plots for 50 ns Late OOT sample (PFlow)

PFMet in ECal



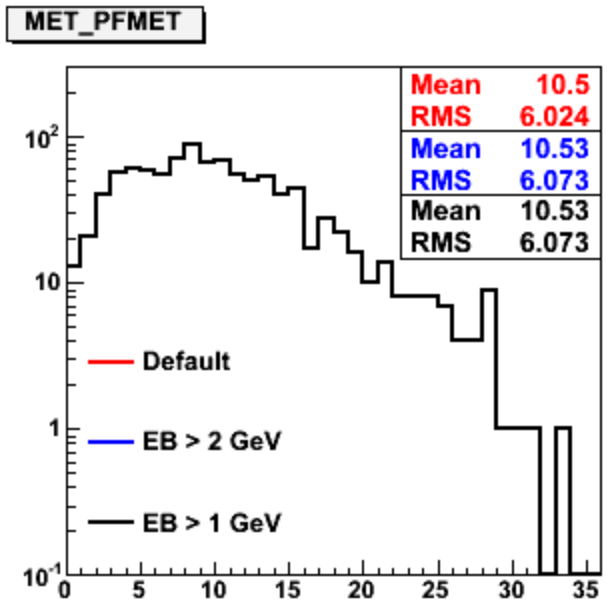


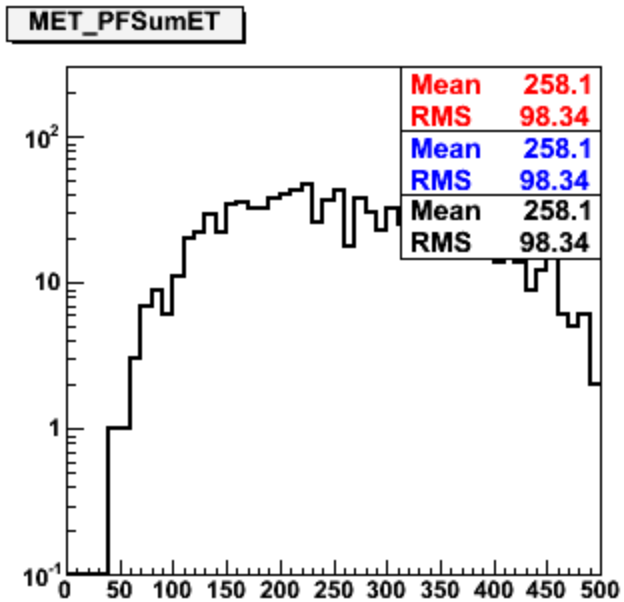


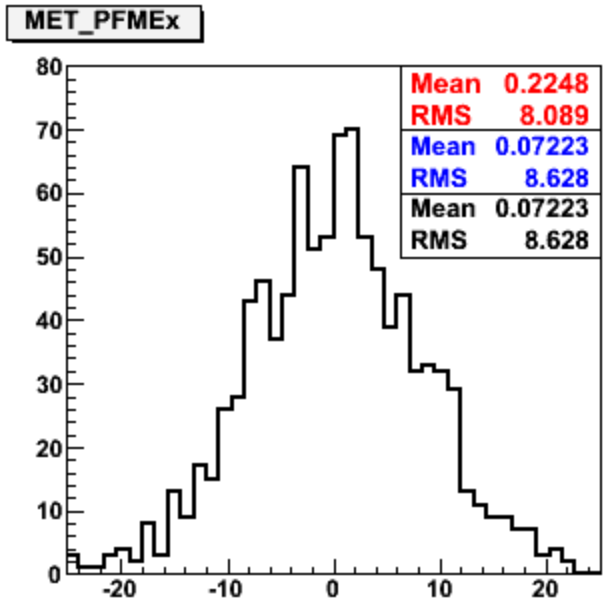


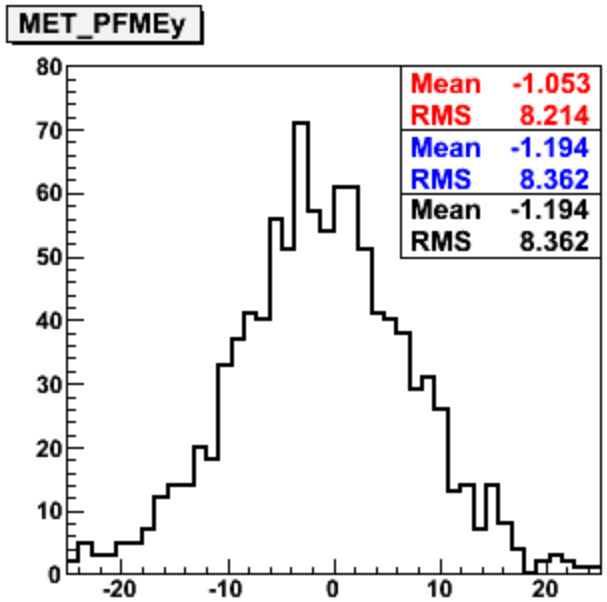
Comparison Plots for 0 ns Early OOT sample (PFlow)

PFMet (total)





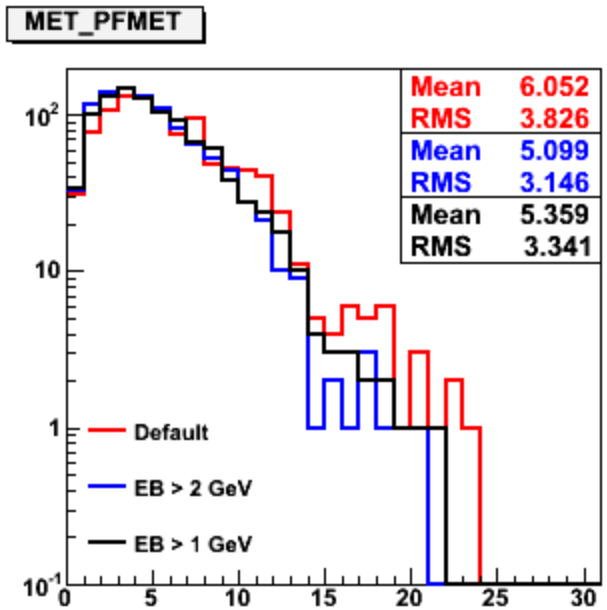


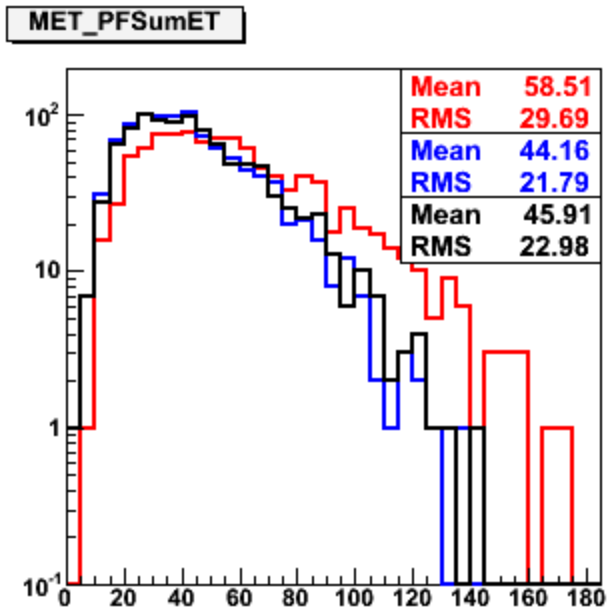


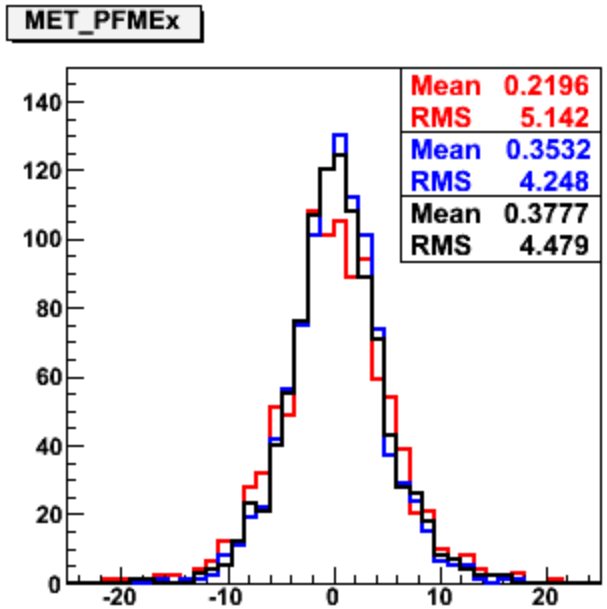
- Not much of an effect

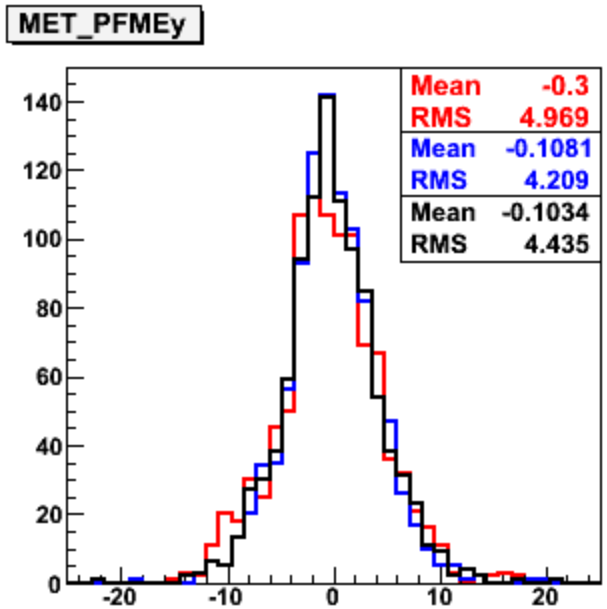
Comparison Plots for 25 ns Early OOT sample (PFlow)

PFMet (total)



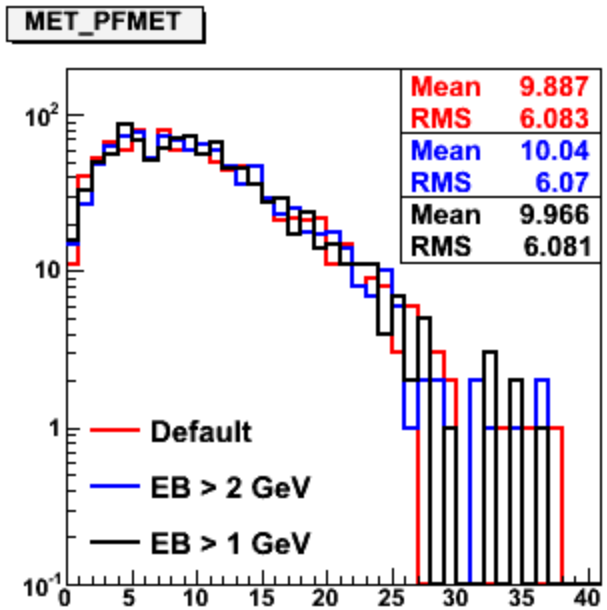


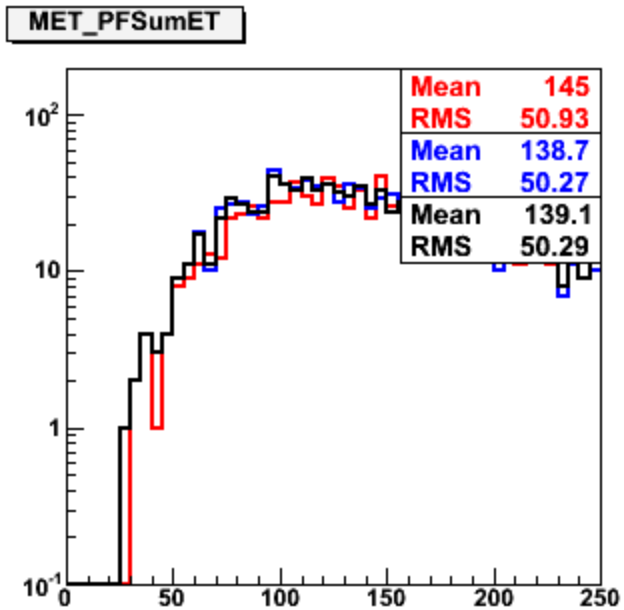


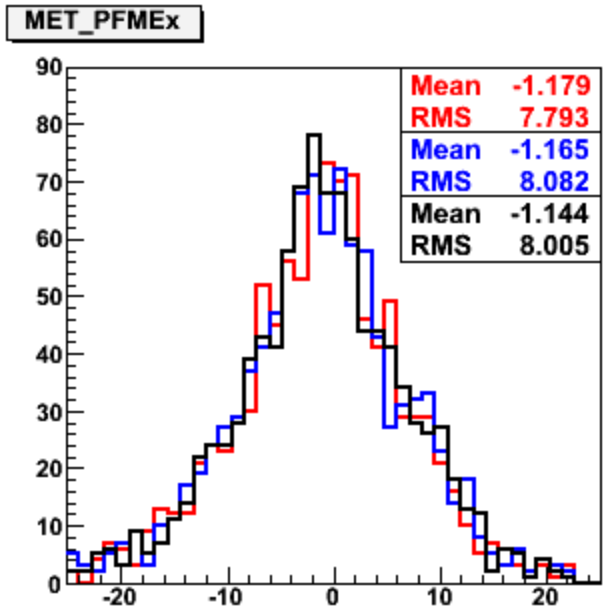


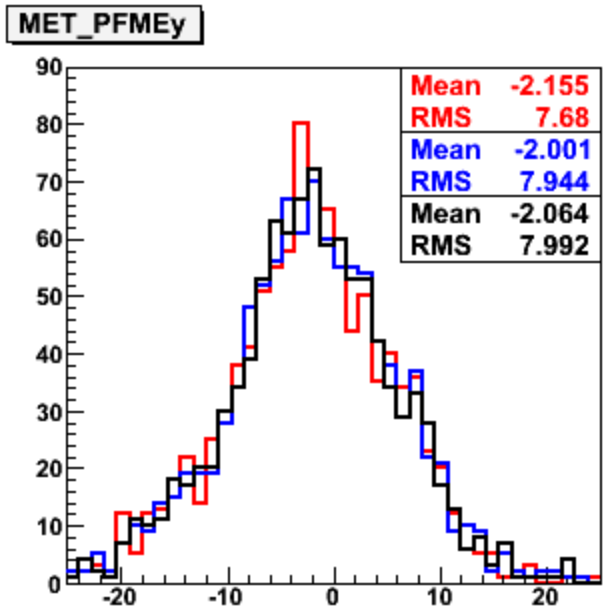
Comparison Plots for 25 ns Late OOT sample (PFlow)

PFMet (total)



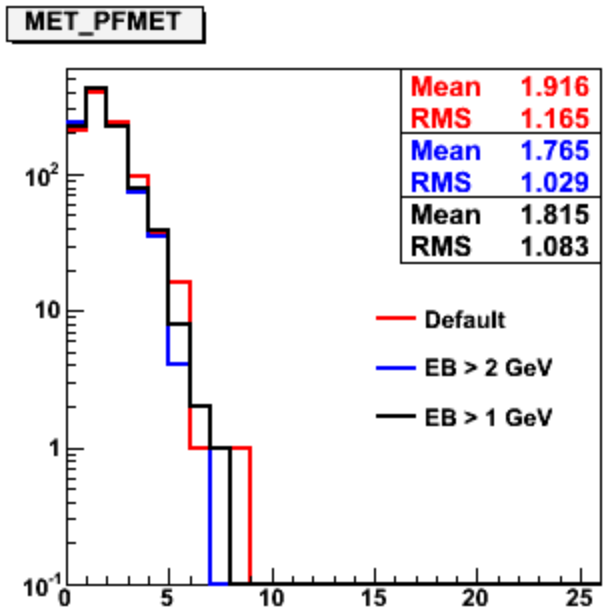


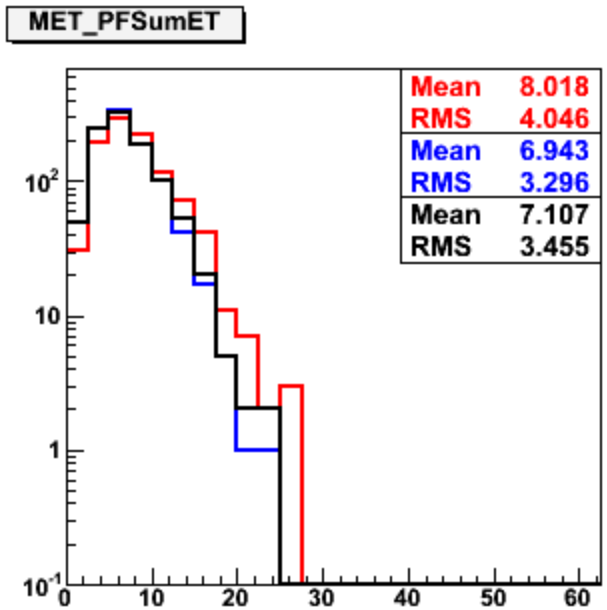


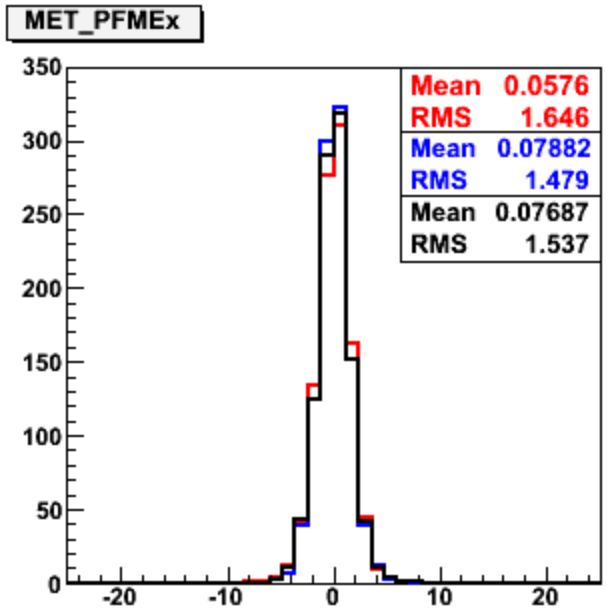


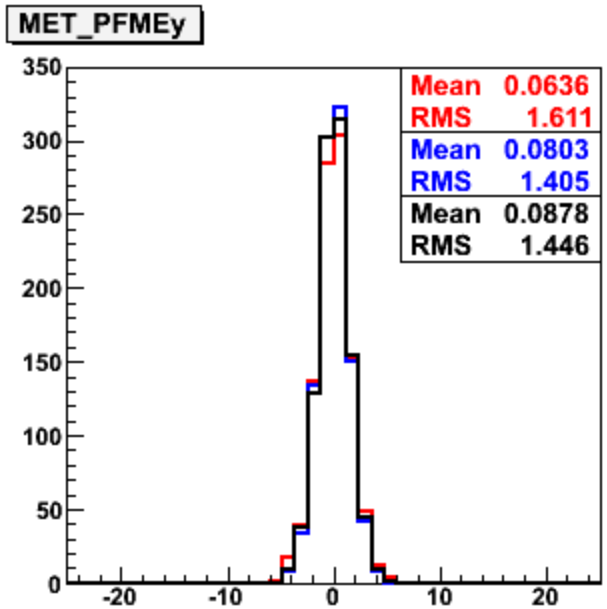
Comparison Plots for 50 ns Early OOT sample (PFlow)

PFMet (total)



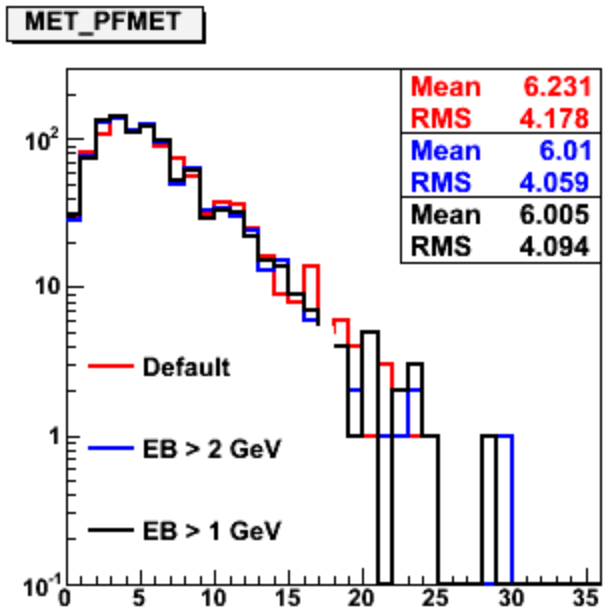


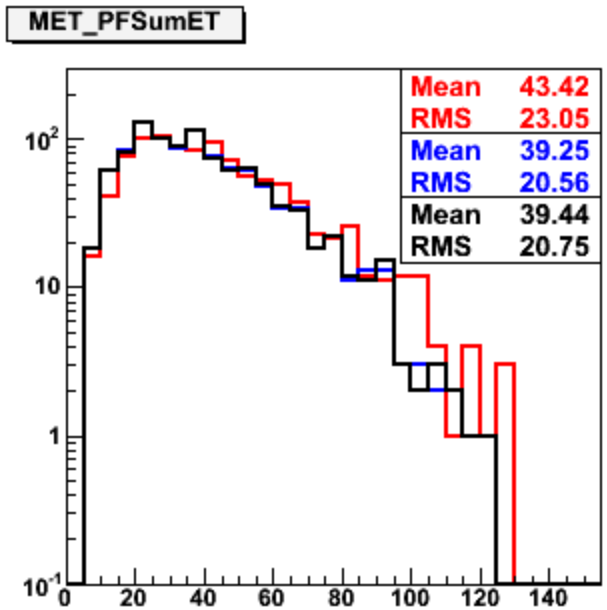


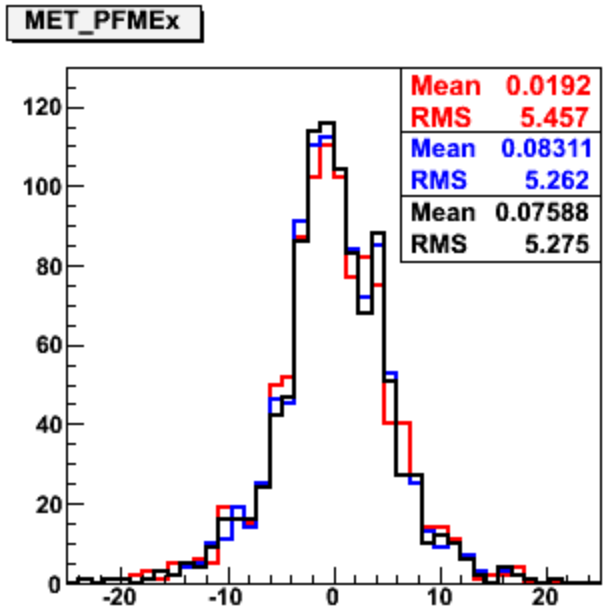


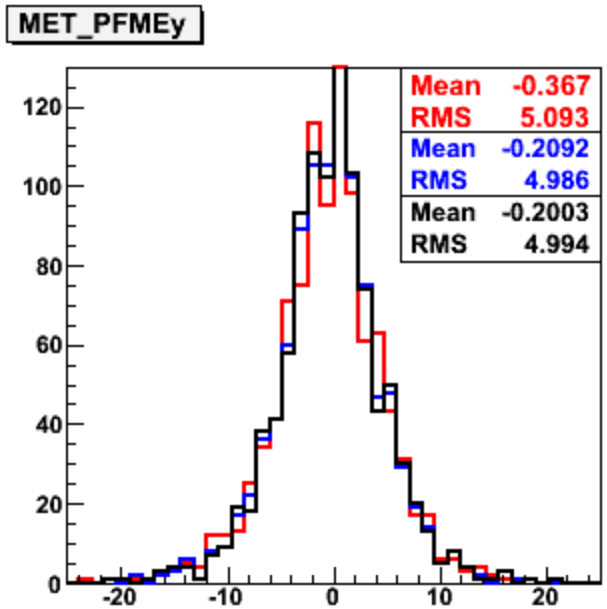
Comparison Plots for 50 ns Late OOT sample (PFlow)

PFMet (total)



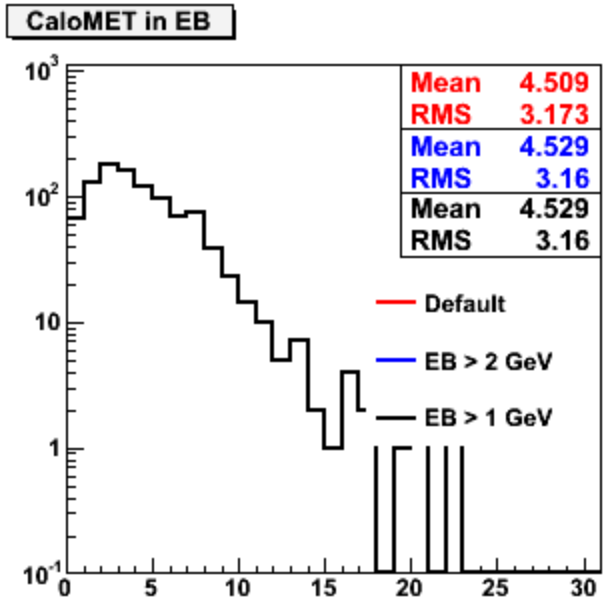


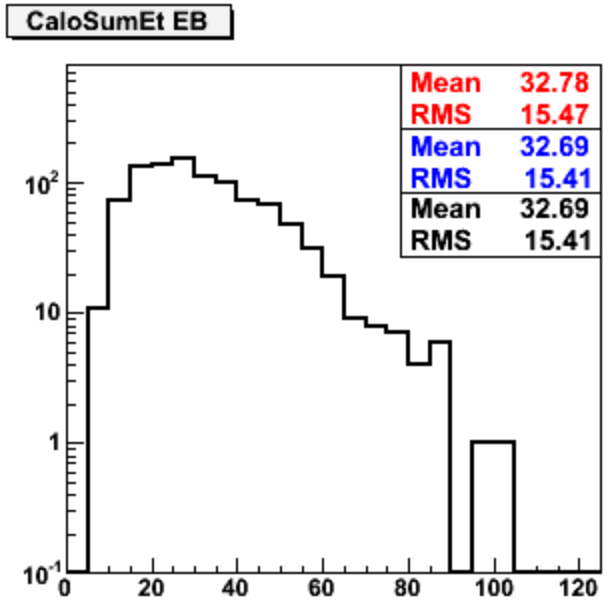


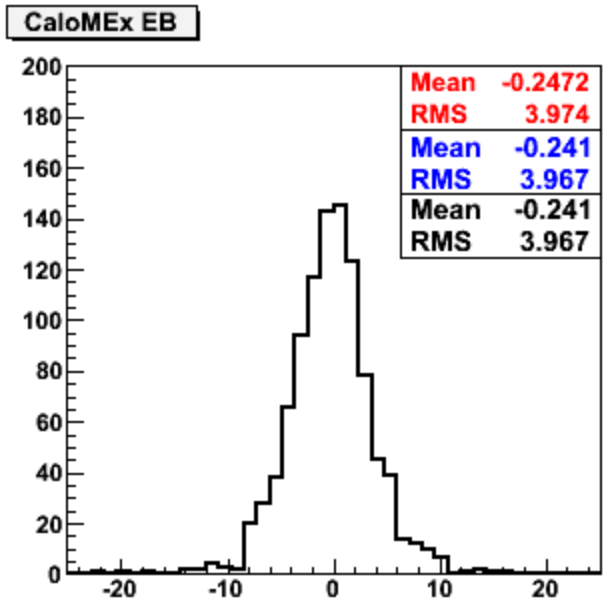


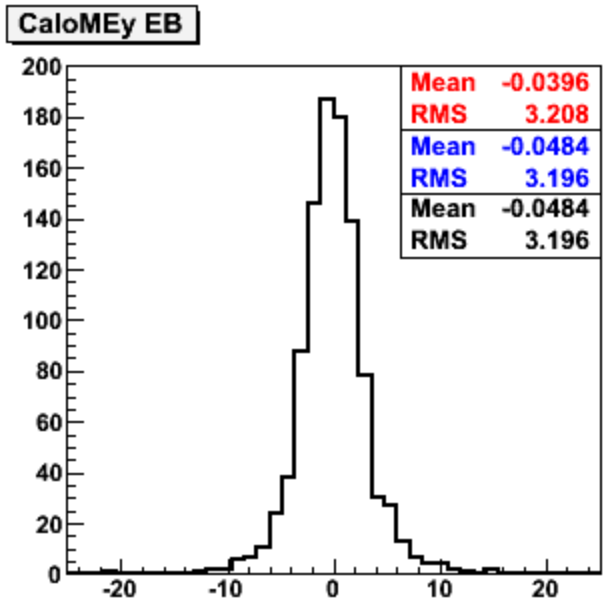
Comparison Plots for 0 ns Early OOT sample (Calo)

CaloMet in EB





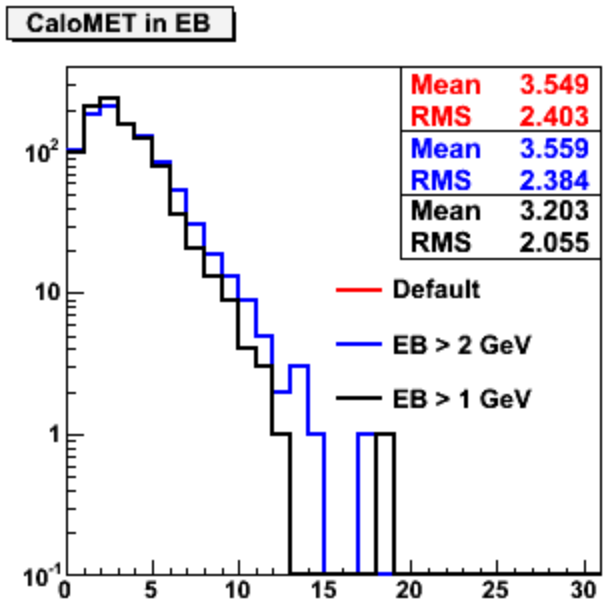


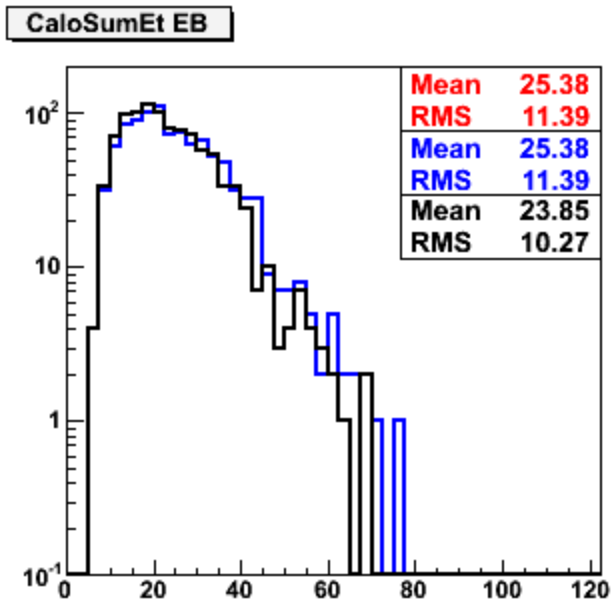


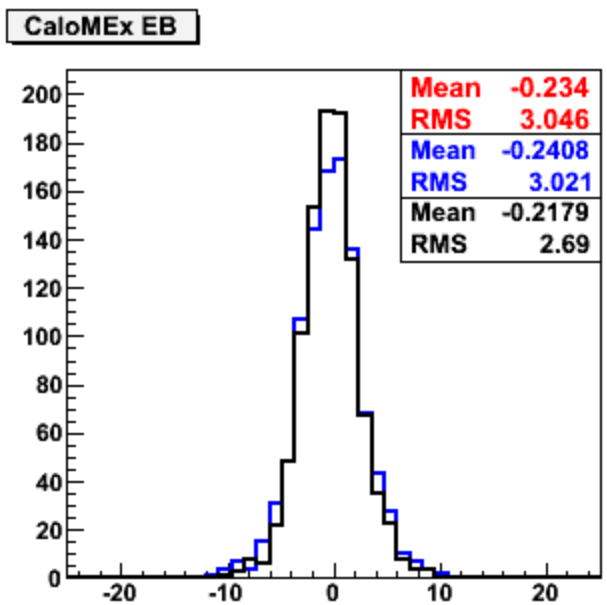
- Not much of an effect

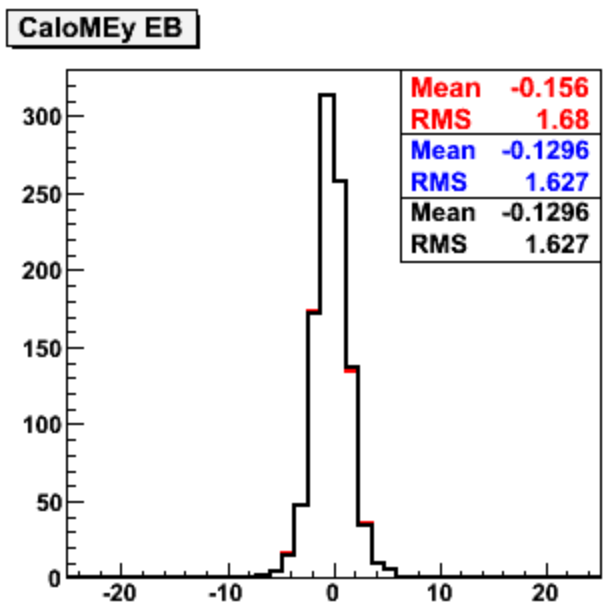
Comparison Plots for 25 ns Early OOT sample (Calo)

CaloMet in EB



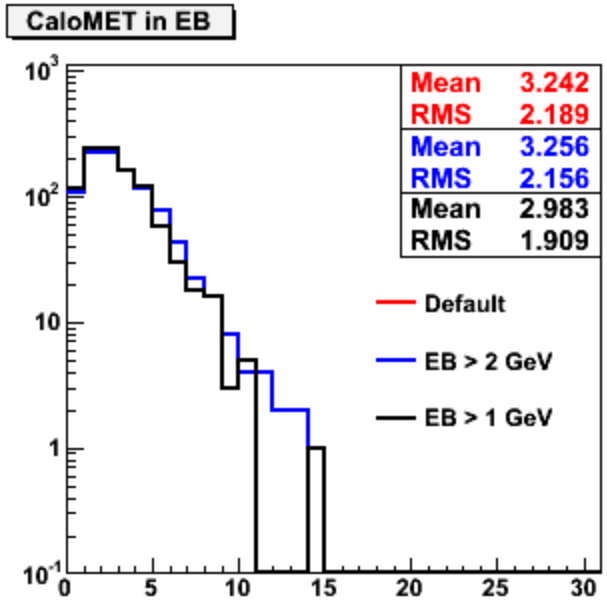


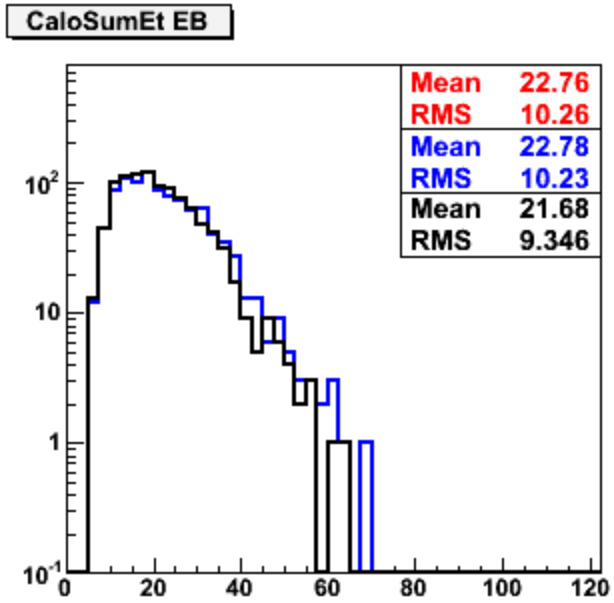


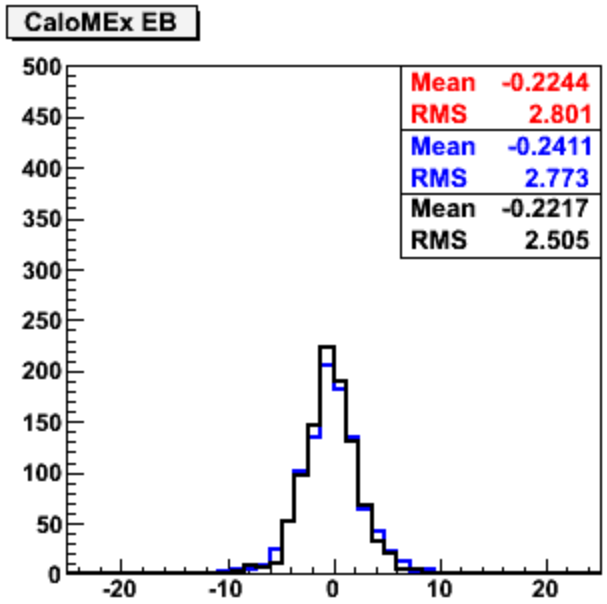


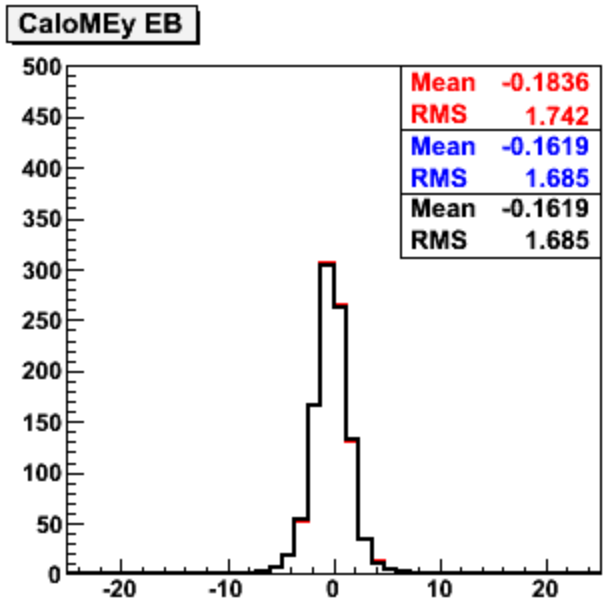
Comparison Plots for 25 ns Late OOT sample (Calo)

CaloMet in EB



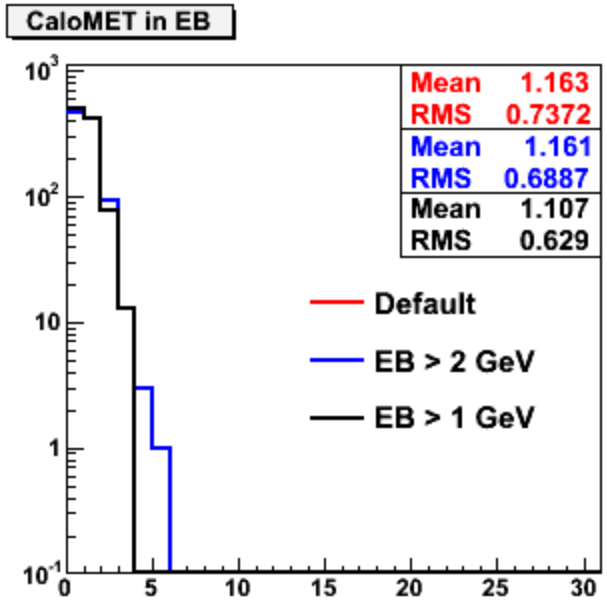


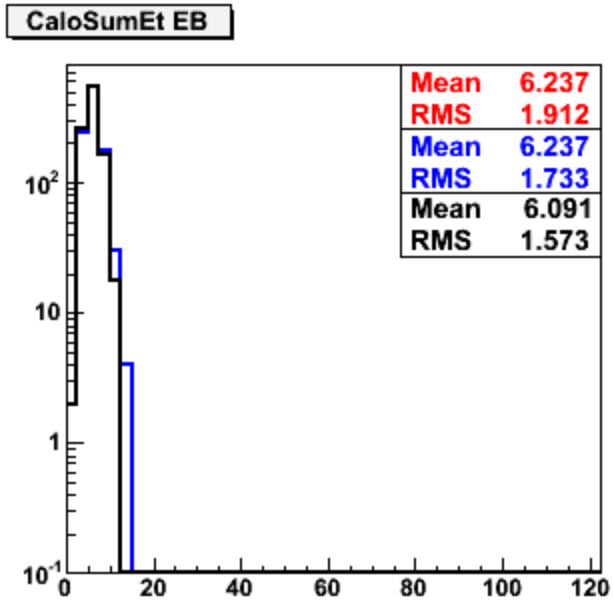


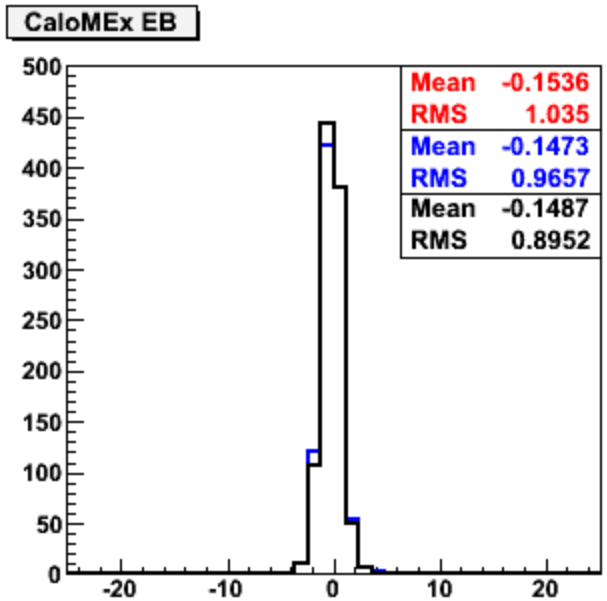


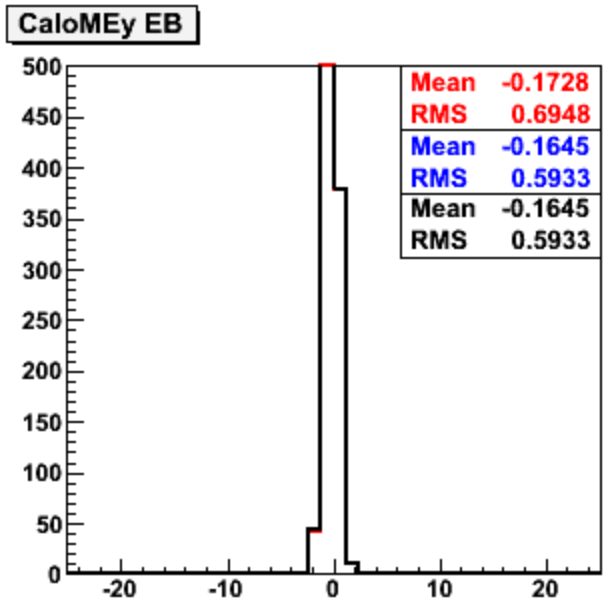
Comparison Plots for 50 ns Early OOT sample (Calo)

CaloMet in EB



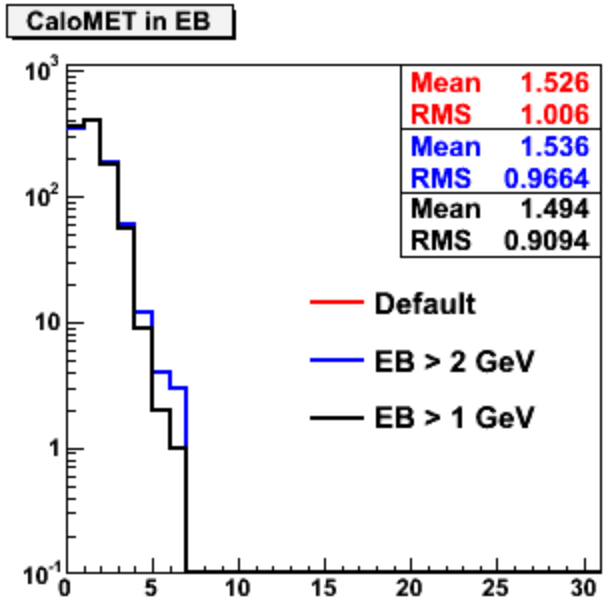


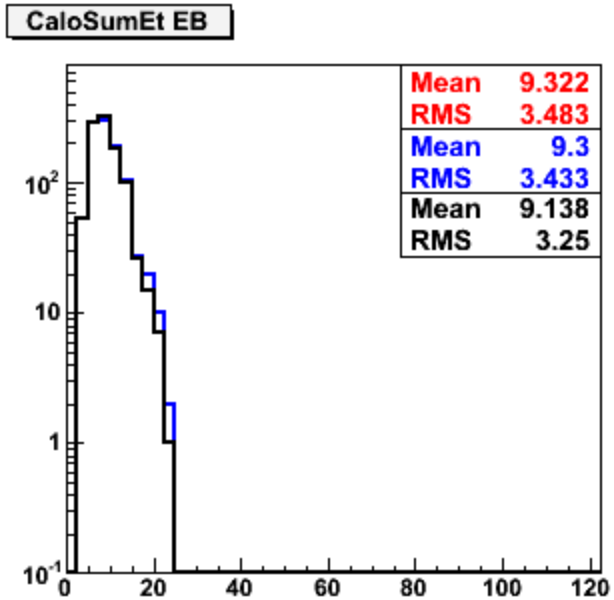


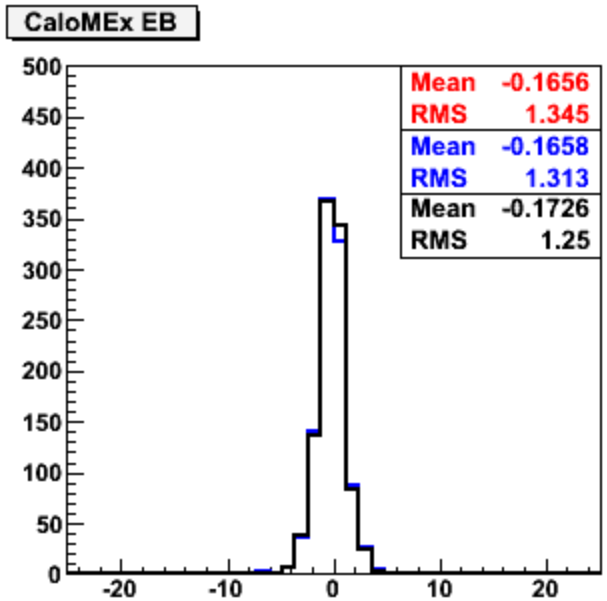


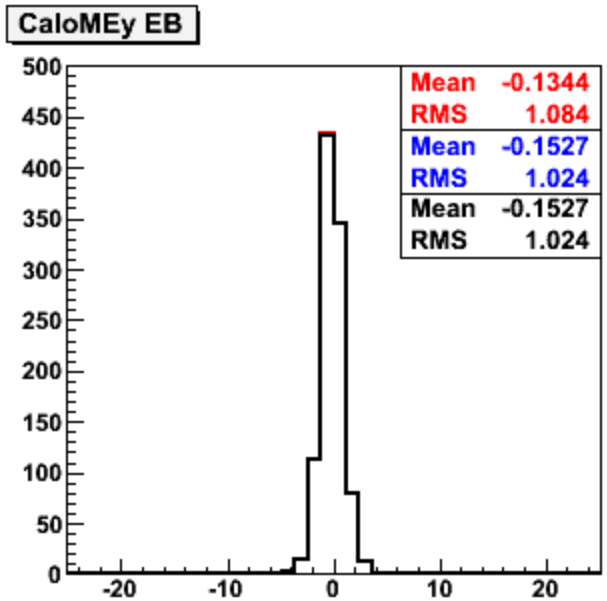
Comparison Plots for 50 ns Late OOT sample (Calo)

CaloMet in EB



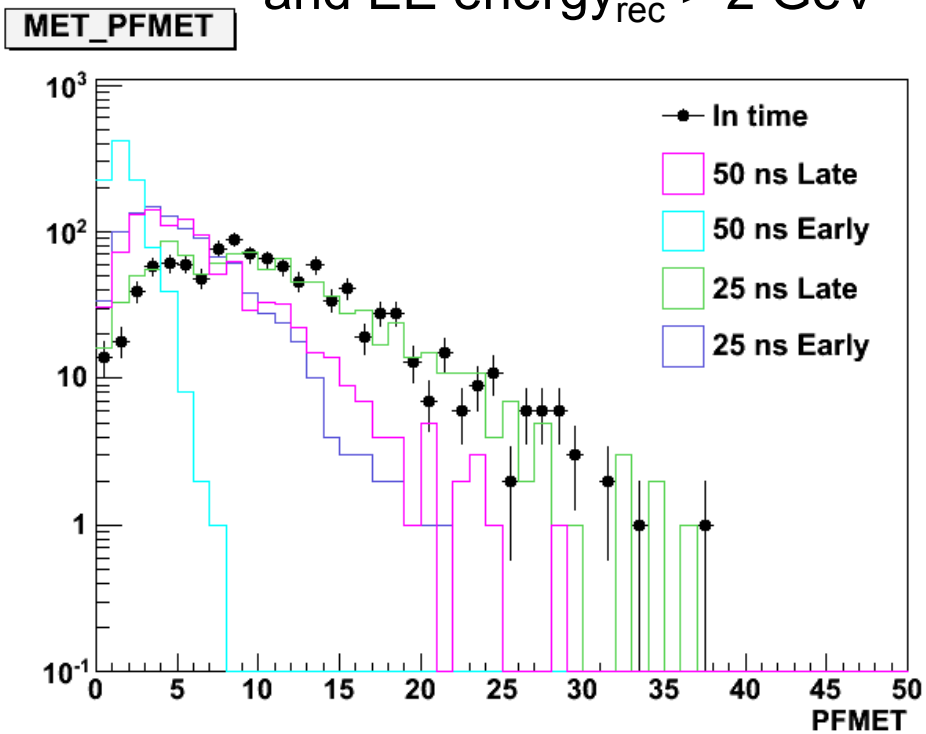




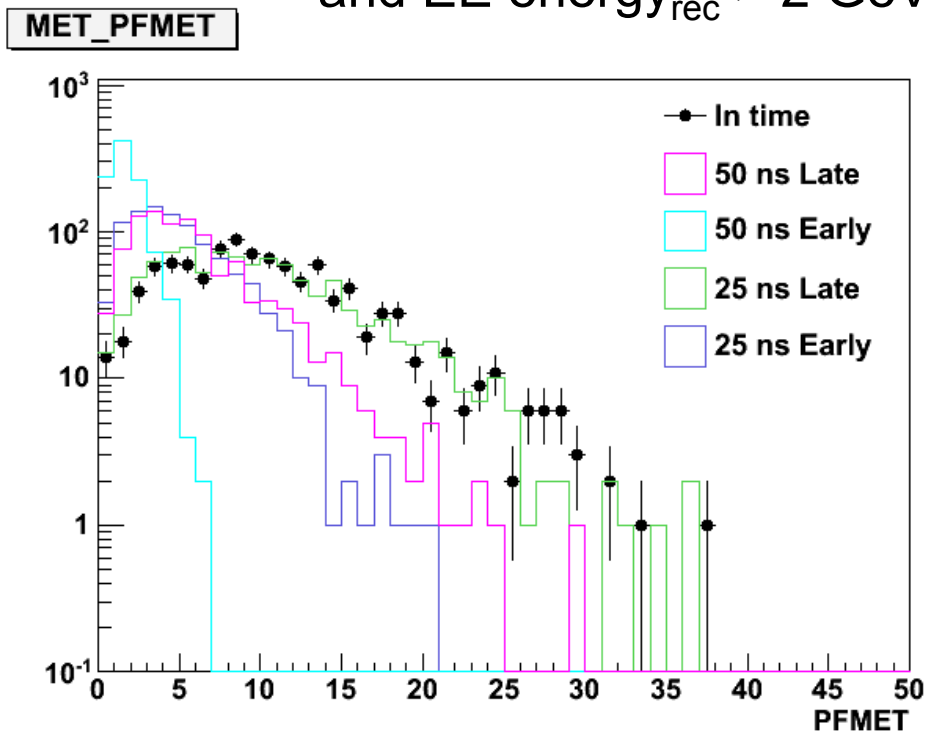


Total PFMETs with various OOT samples

Veto $time_{rec}$ > 15 ns
for EB $energy_{rec}$ **> 2 GeV**
and EE $energy_{rec}$ > 2 GeV



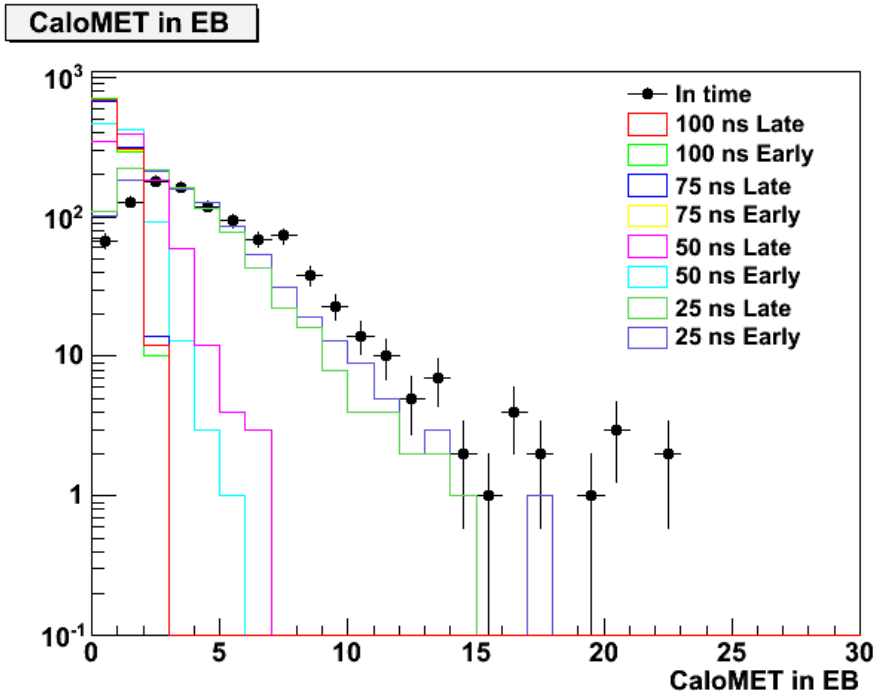
Veto $time_{rec}$ > 15 ns
for EB $energy_{rec}$ **> 1 GeV**
and EE $energy_{rec}$ > 2 GeV



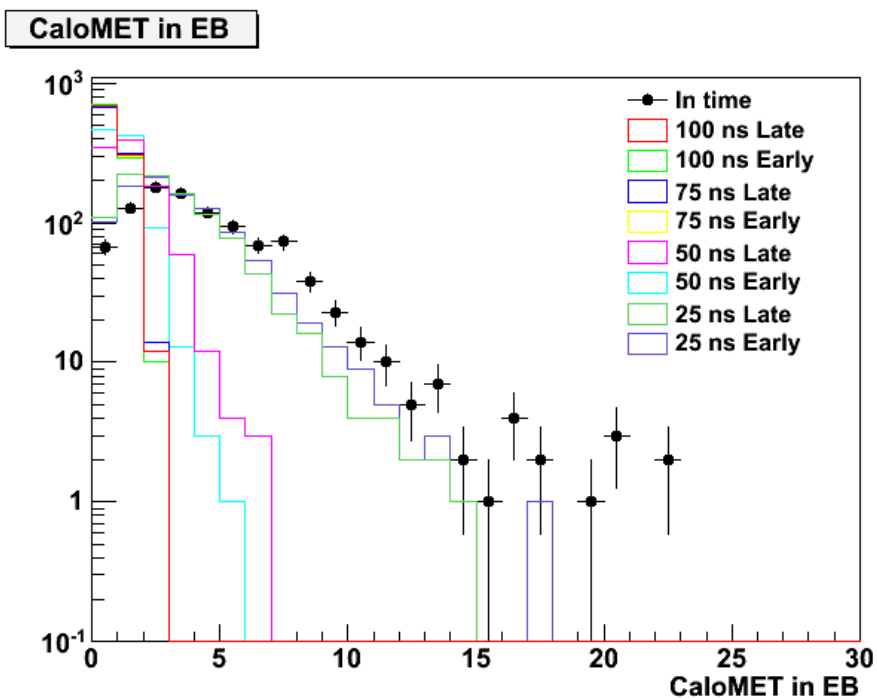
Effect of cleaning small – perhaps have to do similar thing using PFClustersECal and look at MET in EB only!

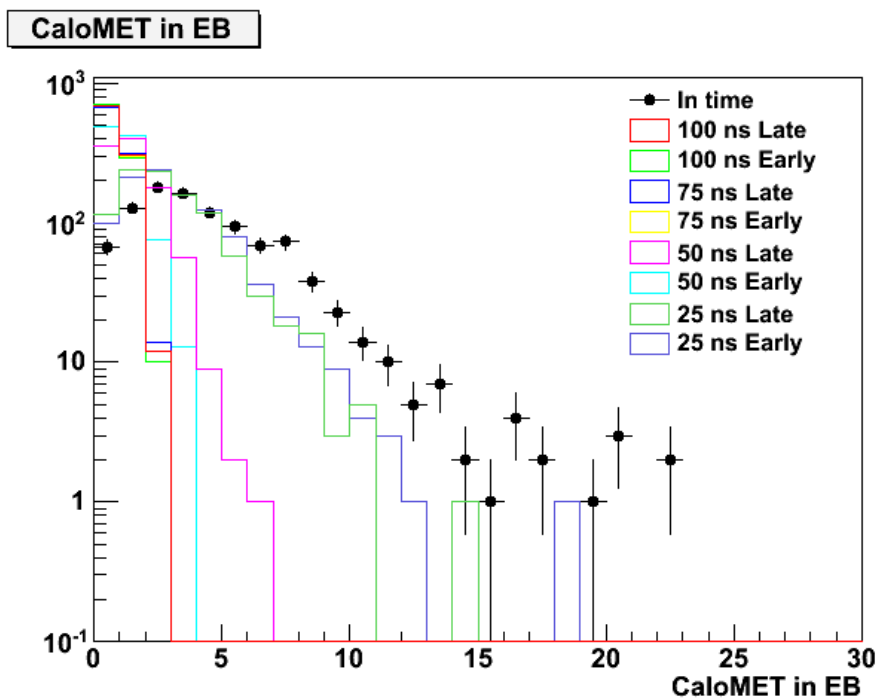
Suvadeep Bose

Comparison plots for CaloMET in EB

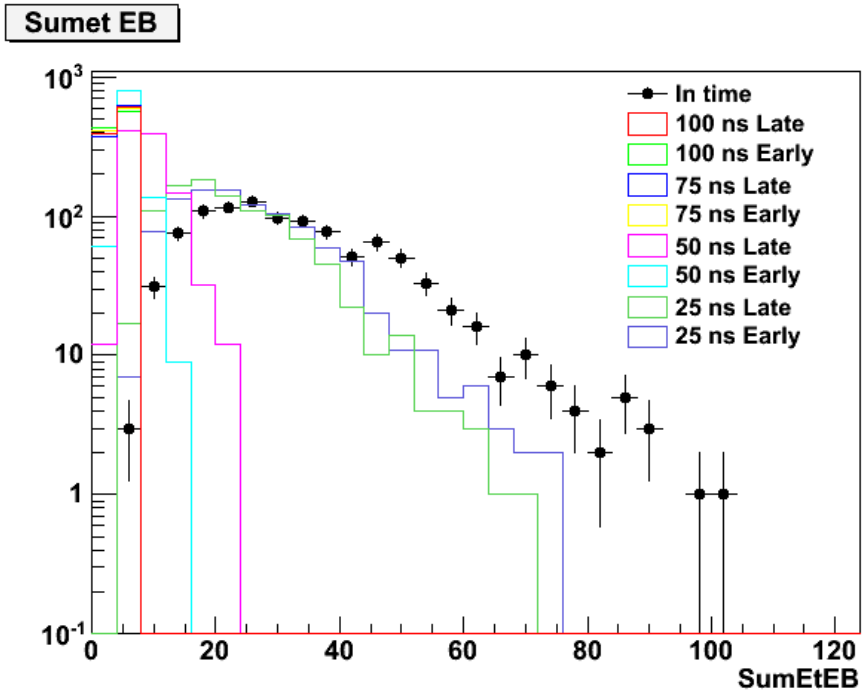


Default cuts	(fig. captions)
Time > 15 ns for EB > 2 GeV	Time > 15 ns for EB > 1 GeV



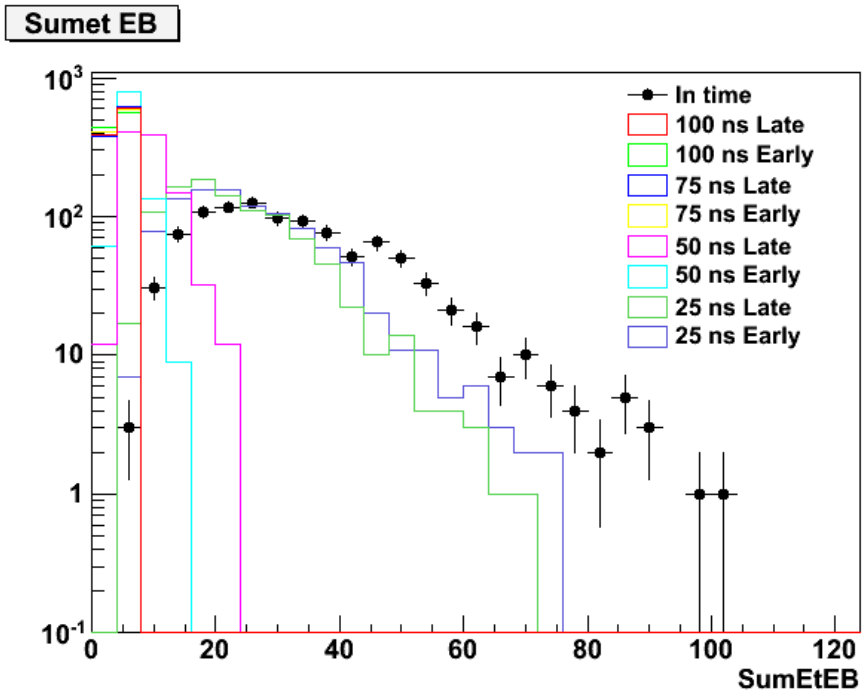


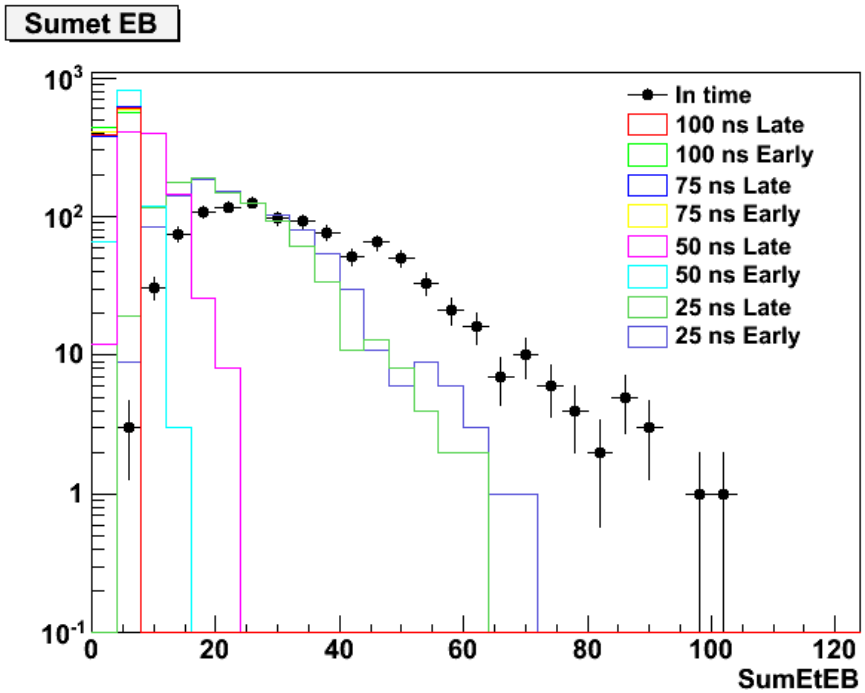
Comparison plots for SumEt in EB (Calo)



Default cuts	(fig. captions)
Time > 15 ns for EB > 2 GeV	Time > 15 ns for EB > 1 GeV

Default cuts: No time cut, EB/EE > 2GeV





- For more comparison plots for CaloMET and PFMET in Ecal only with all the OOT samples (0 ns, 25 ns, 50 ns etc) plotted on same canvas please refer to the talk here: http://home.fnal.gov/~sbose/MET/MET_Suvadeep_110726.pdf

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