Status of Jet Corrections in Run II

Lina Galtieri
Top Group
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- Limited Scope:

  - Provide jet corrections for basic JETCLU algorithm.
  - Investigate corrections for other jet algorithms. NEW

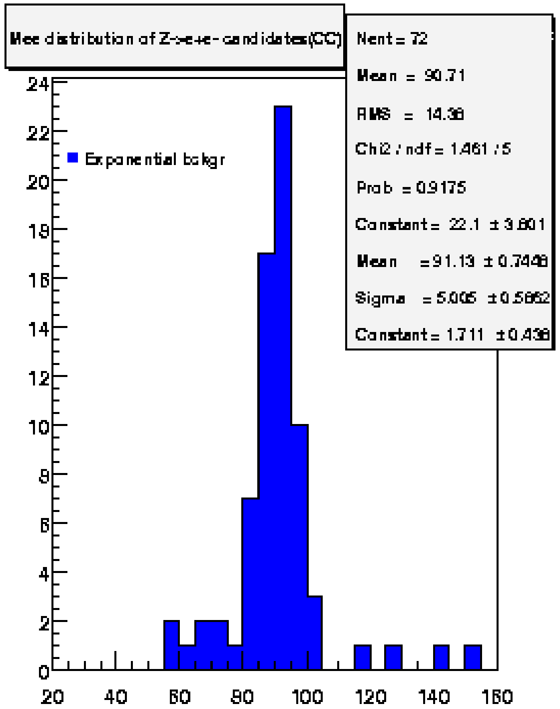
Follow Run I method to provide corrections for summer physics

1. Check Calorimeter E-scale.
2. Tune simulation to reproduce test beam data + low E_T pions in TeV data.
3. Tune jet fragmentation(charged particles) in Monte Carlo to reproduce tracks in jets.
4. Use Monte Carlo to go from particles to jets.
5. Derive all the correction functions for a Run II JTC96X.

Status of Calorimeter E-scale

1. CEM and PEM Energy scale

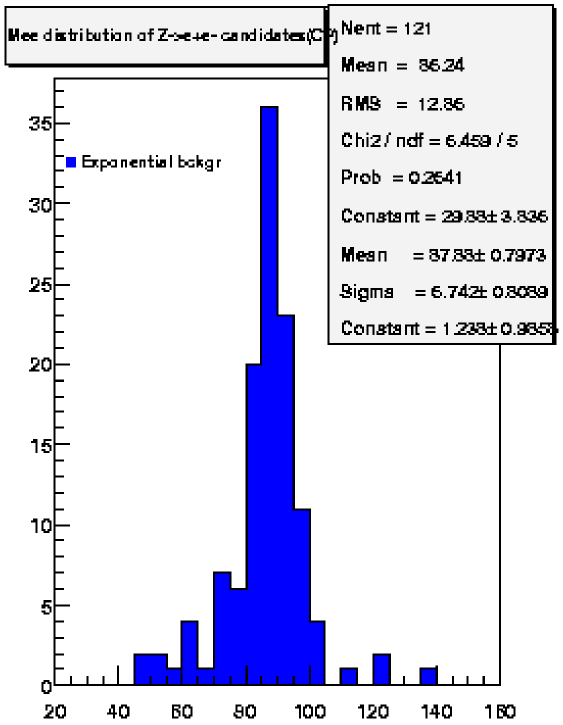
We have Z $\rightarrow e^+e^-$ from the ETF work. Fit by Mircea Coca.



Z mass for CEM-CEM electrons

M(Z)=91.1 ±0.7 GeV

$\mathbf{\Delta(E)_{CEM} \sim 0}$



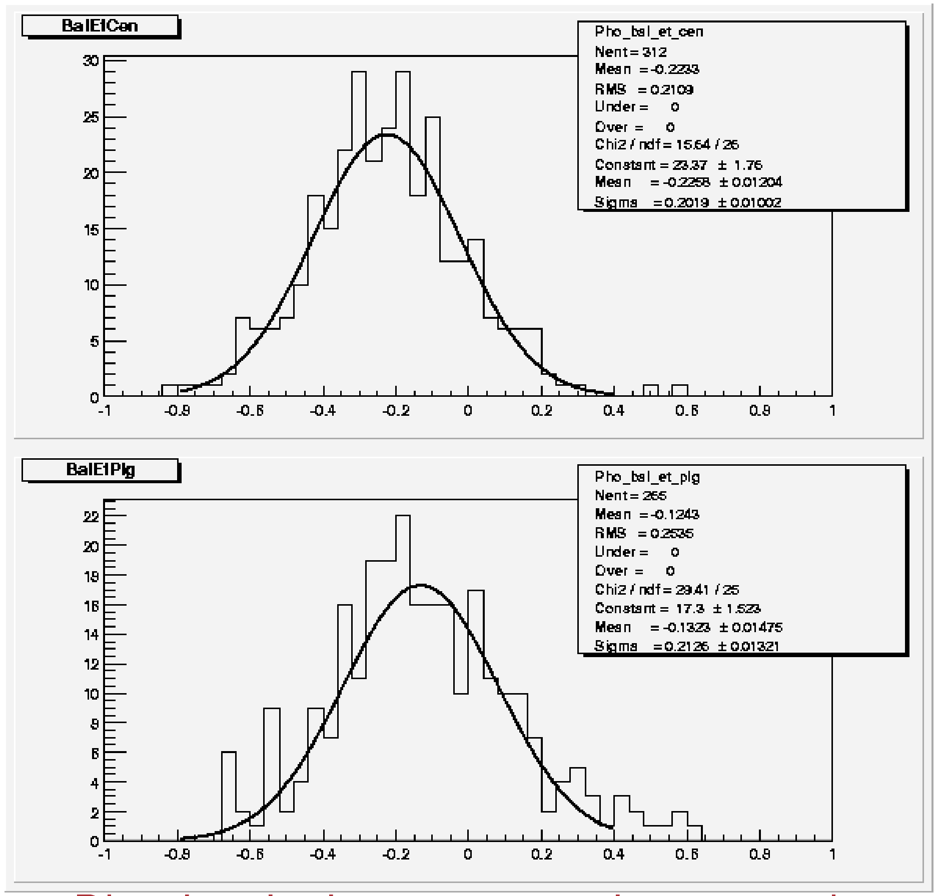
Z mass for CEM-PEM electrons

MZ=87.9 ±0.8 GeV

$\mathbf{\Delta(E)_{CEM} = -7.2\%}$

2. γ-jet balance

Compare run II with Run I with no correction on jets (Latino/Heinemann):



Central Calorimeter jets

DP_T/P_T = -(19.4 $\pm$ 0.1)% Run I

DP_T/P_T = -(22.6 $\pm$ 1.2)% Run II

$\Delta(P_T/P_T)_{jets}$ = -(3.2 $\pm$ 1.2)%

Plug Calorimeter jets

DP_T/P_T = -(13.2 $\pm$ 1.5)% Run II

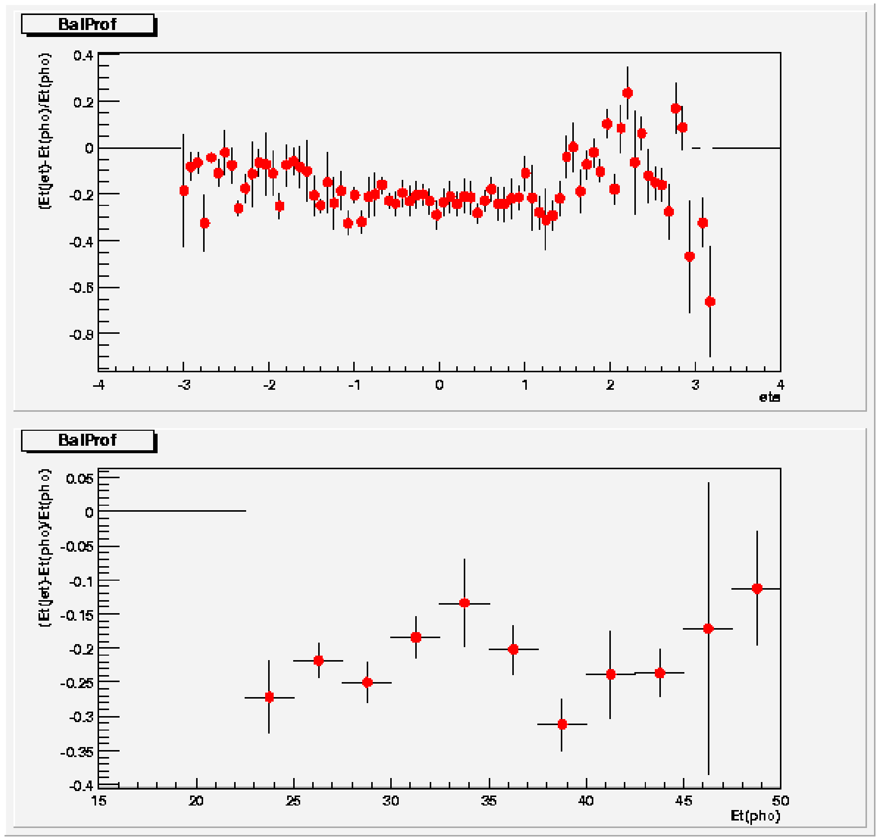
$\Delta(DP_T/P_T)_{P-C}$ = +(9.4 $\pm$ 1.9)%

Plug has higher response than central.

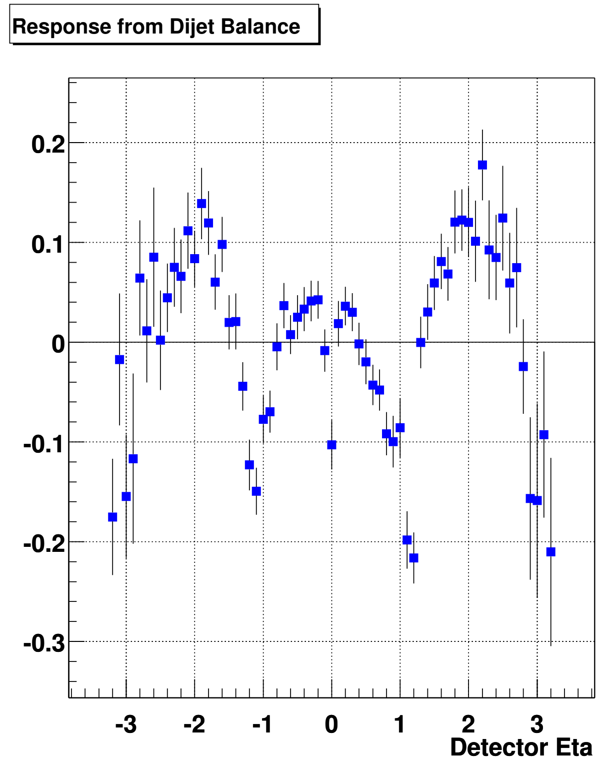
Is it E-scale problem or just different calorimeter response?

3. Di-jet balance: η dependence

Use γ-jet balance and di-jet balance to get relative correction.
The two sets of data (taken after Dec. 10) should be consistent.



γ-jet balance (Giuseppe/Beate)



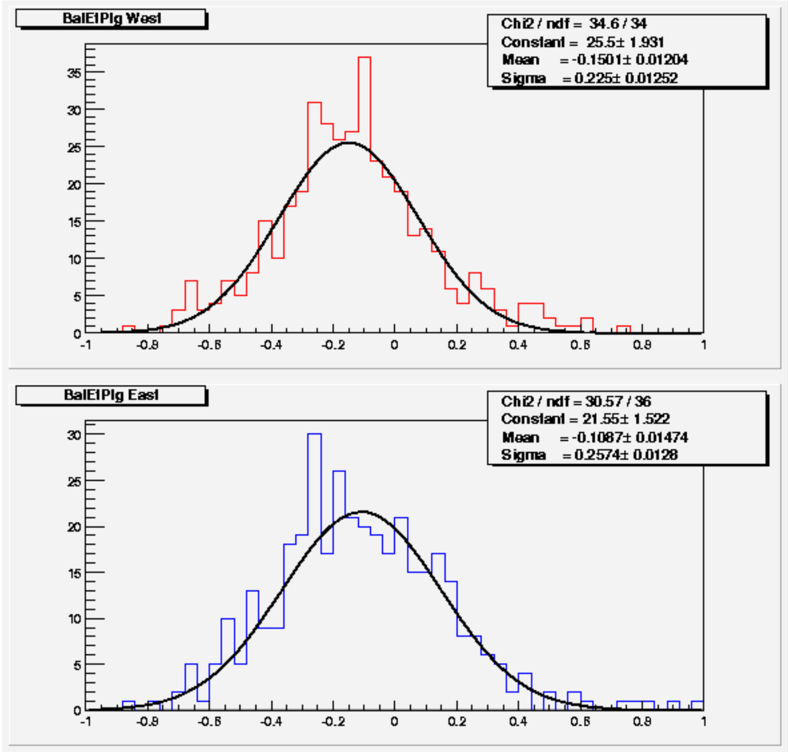
di-jet balance (Gene Flanagan/RobertH)

Results consistent with plug response being higher by $\sim 10\%$.

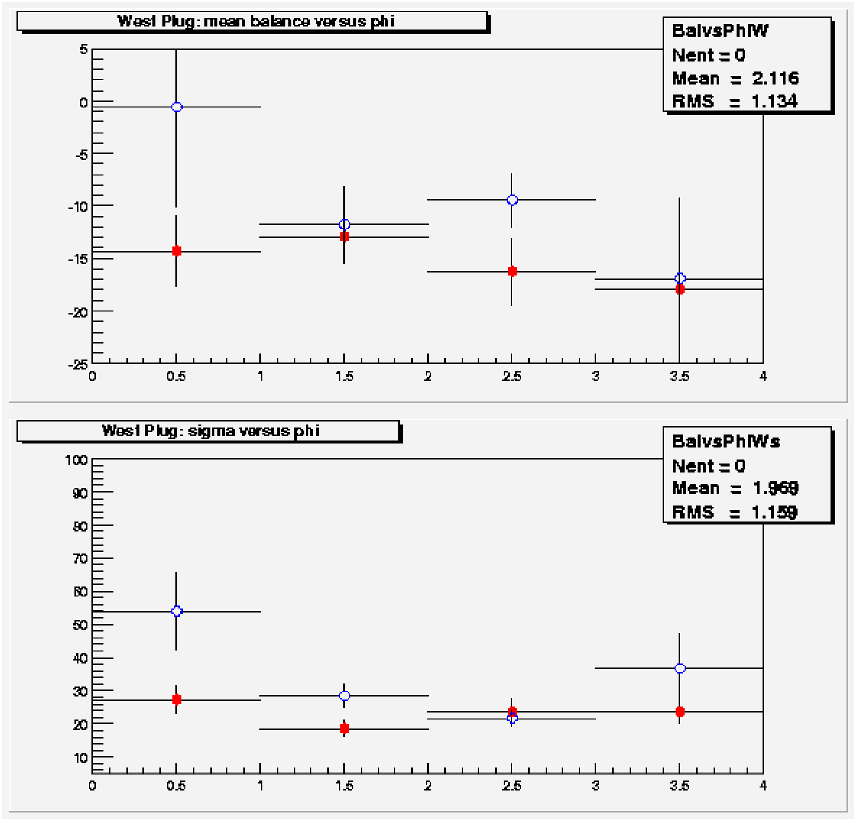
γ-jet balance shows asymmetry in the East-West plug, but smaller data sample.

4. East-West Plug Asymmetry

(a) Gamma-Jet Balance (Beate Heinemann).
Phi Dependence (runs 134471-136036)



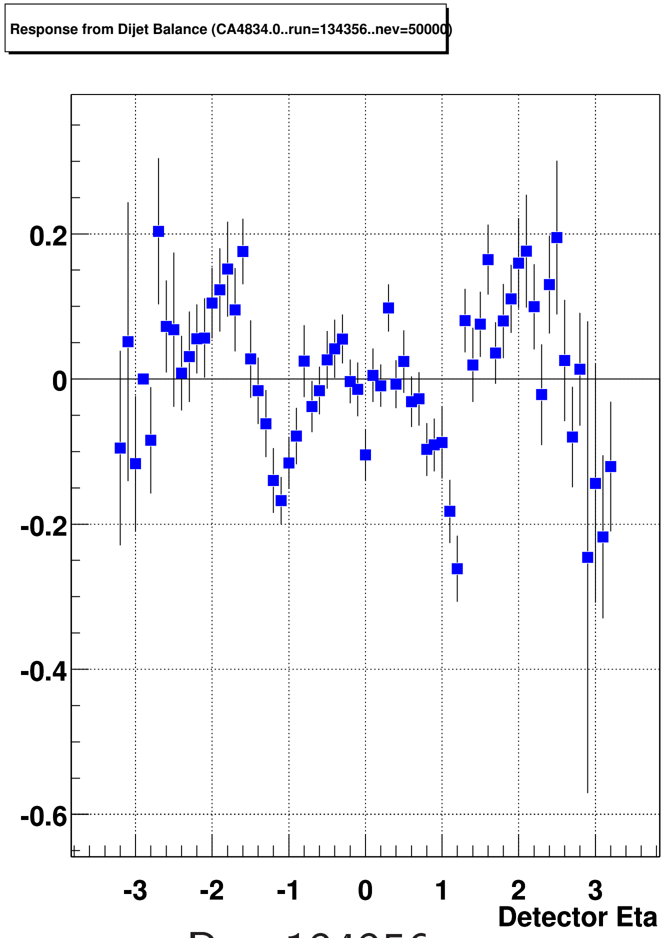
East and West plug E-balance
West=-(15.0±1.2)%
East=-(10.9±1.5)%



PHI Dependence of response
East lower than West, bin=1
East wider width, bin=1

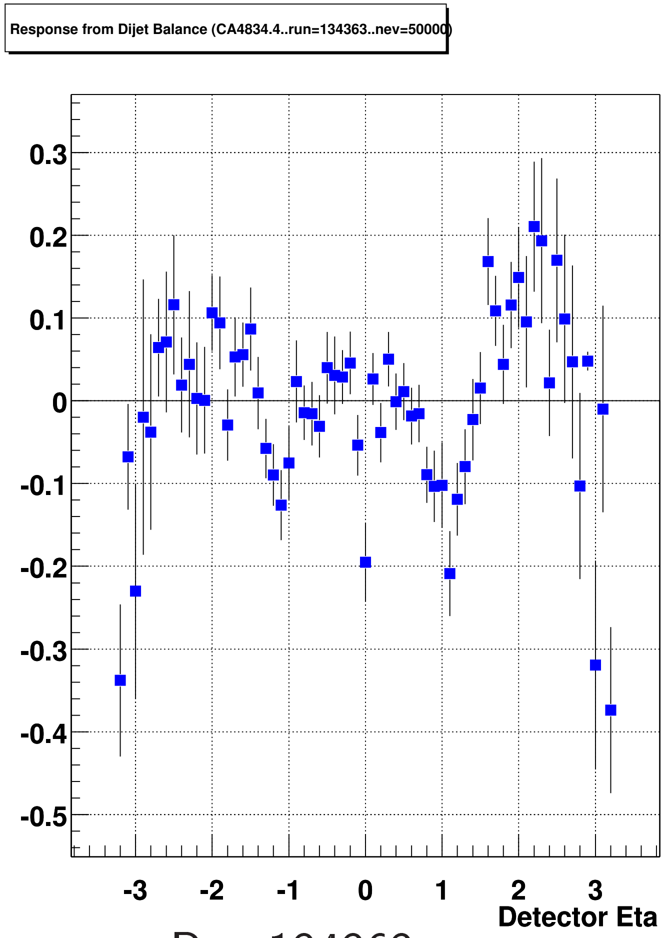
(b) Run Dependence PLug Energy scale

Di-jet balance (Gene Flanagan).



Run 134356

East ∼ West plug



Run 134363

East Plug lower than West

5. Conclusion on Calorimeter E-scale

- CEM looks OK (from Z's)
- CHA very close, -(2.0 ± 1.0)% (from J/ψ muons)
- PEM shifted by -7.2% (from Z's)

- Central jets: shifted by $\sim$ -3% (from γ-jet balance).
- Plug jets: higher than central by $\sim$ 10% (from γ-jet balance and di-jet balance)

* East Plug problems to be understood!!

The above results imply that the PHA has a higher response than the CHA.

- Need pions and muons in the plug.
- Need a tuned Monte Carlo to understand the expectations for plug jets.