L3 Electron p15 Certification

Reinhard Schwienhorst

L3 Meeting, 05/28/03

Introduction

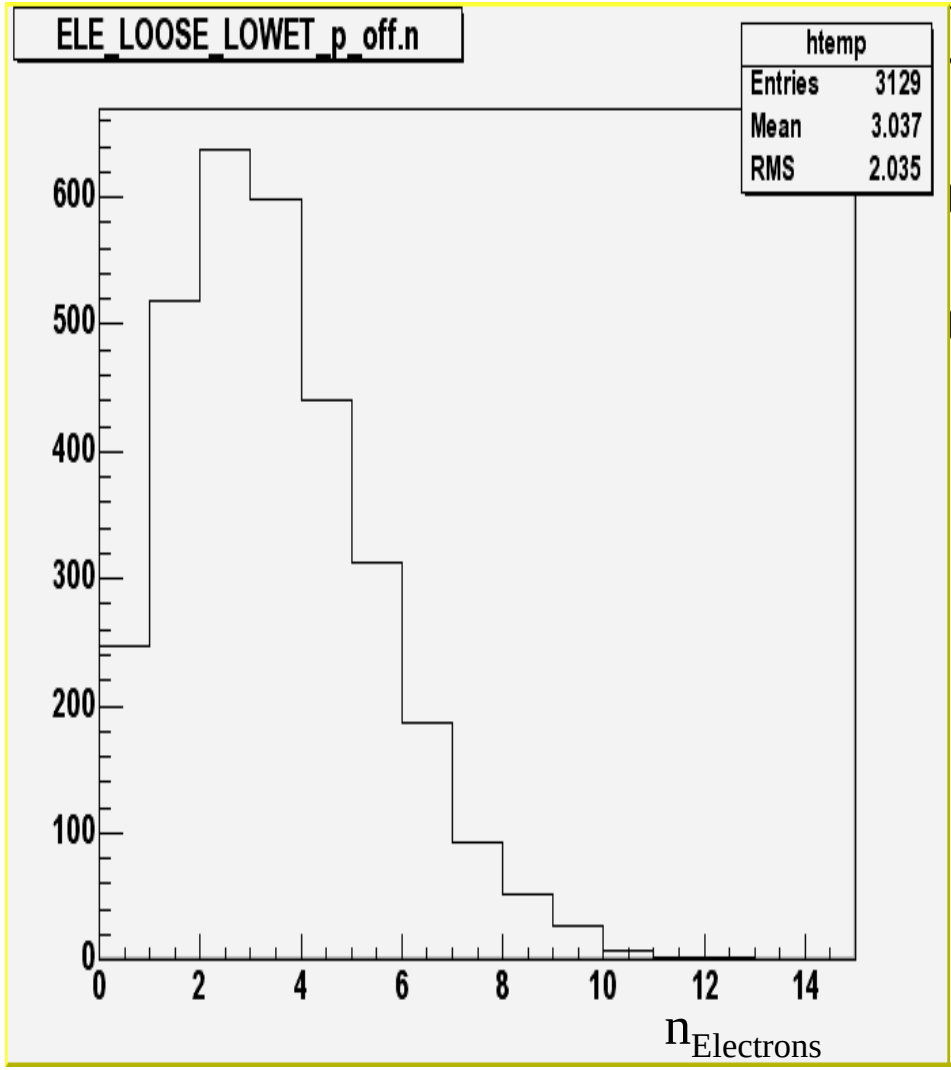
- Running p15.02.00 L3 exectuable over data
  - maxopt
  - 50000 events from special CEM_OR run
  - 1000 $Z \rightarrow ee$ events, 1000 $Z \rightarrow \mu\mu$ events
  - Special hand-made p15-compatible trigger list
    - Includes most of the version 12 triggers/filters
    - /home/schwier/work/d0/top/trigger/triggerlist/simfiles/tsim_p15-data
    - Many electrons, 2 b-taggers, DR filter, tau filter,…
  - Crash due to L3 Ele with no EMFR cut
    - And in L3 Tau destructor, geometry_management
- Look at L3 electrons
  - Also Z-vertex, muons

P13-p15 comparisons

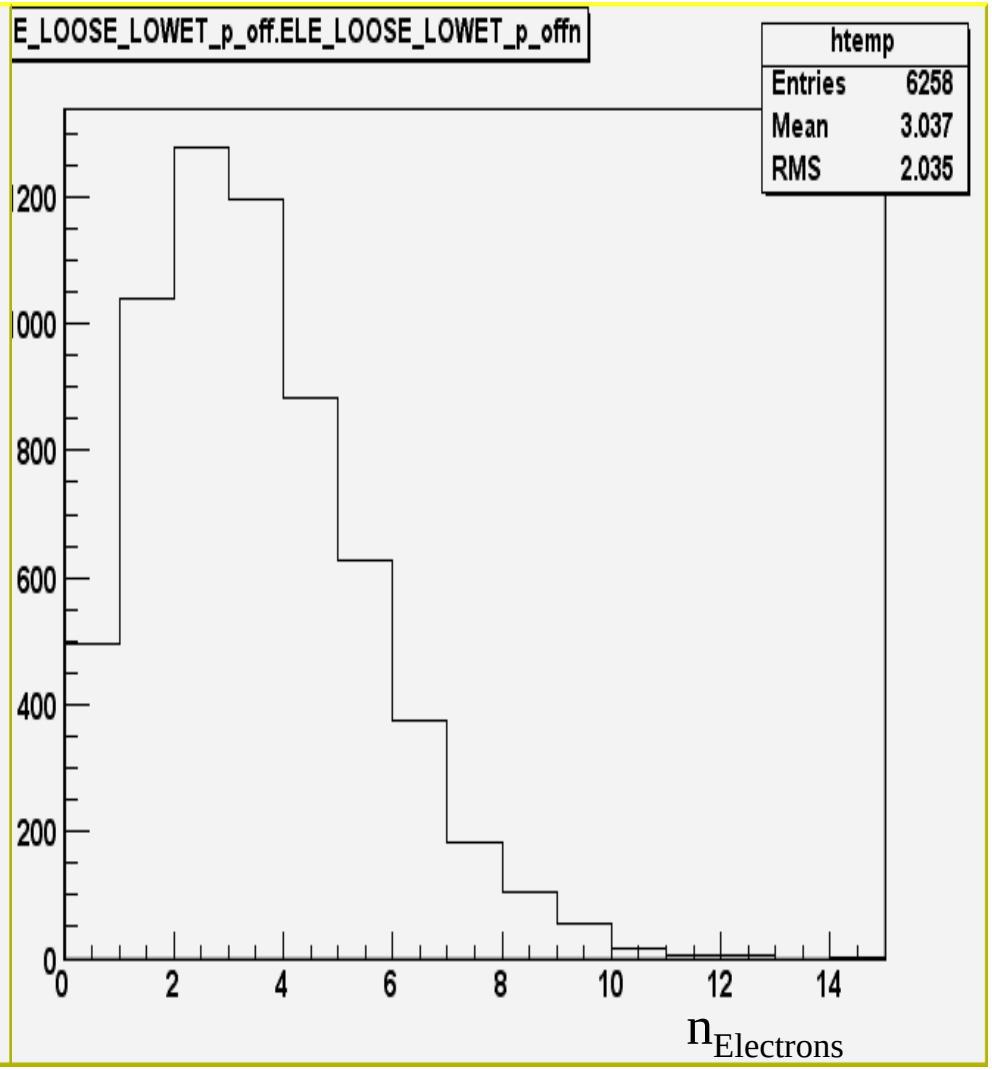
- Run over same input raw data file
- Compare distributions
  - No scatter plots
  - For ele_loose and ele_lowet
- P15 trigsim_analyze puts in 2× the # of entries
  - Distributions are identical (mean, stdev)
  - Number of entries disagrees

ELE_LOOSE_LOWET
of electrons

P13

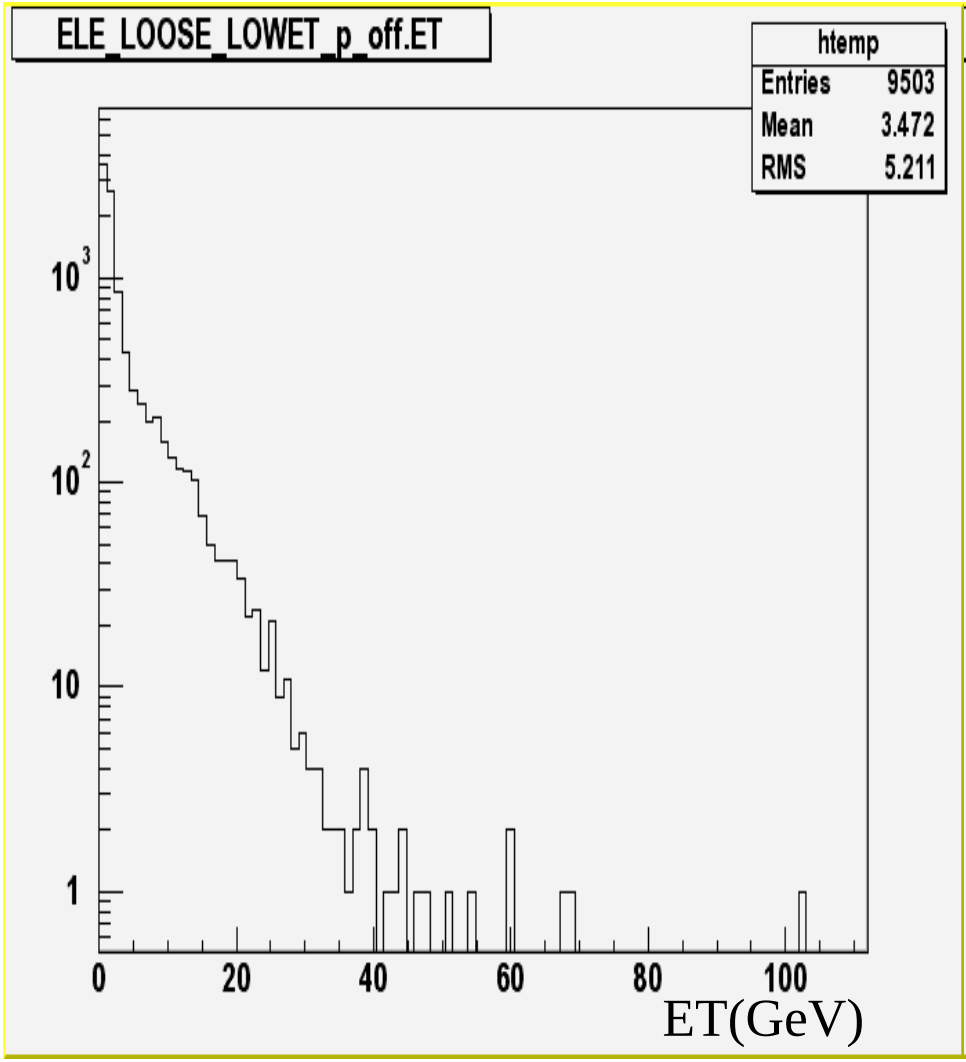


P15

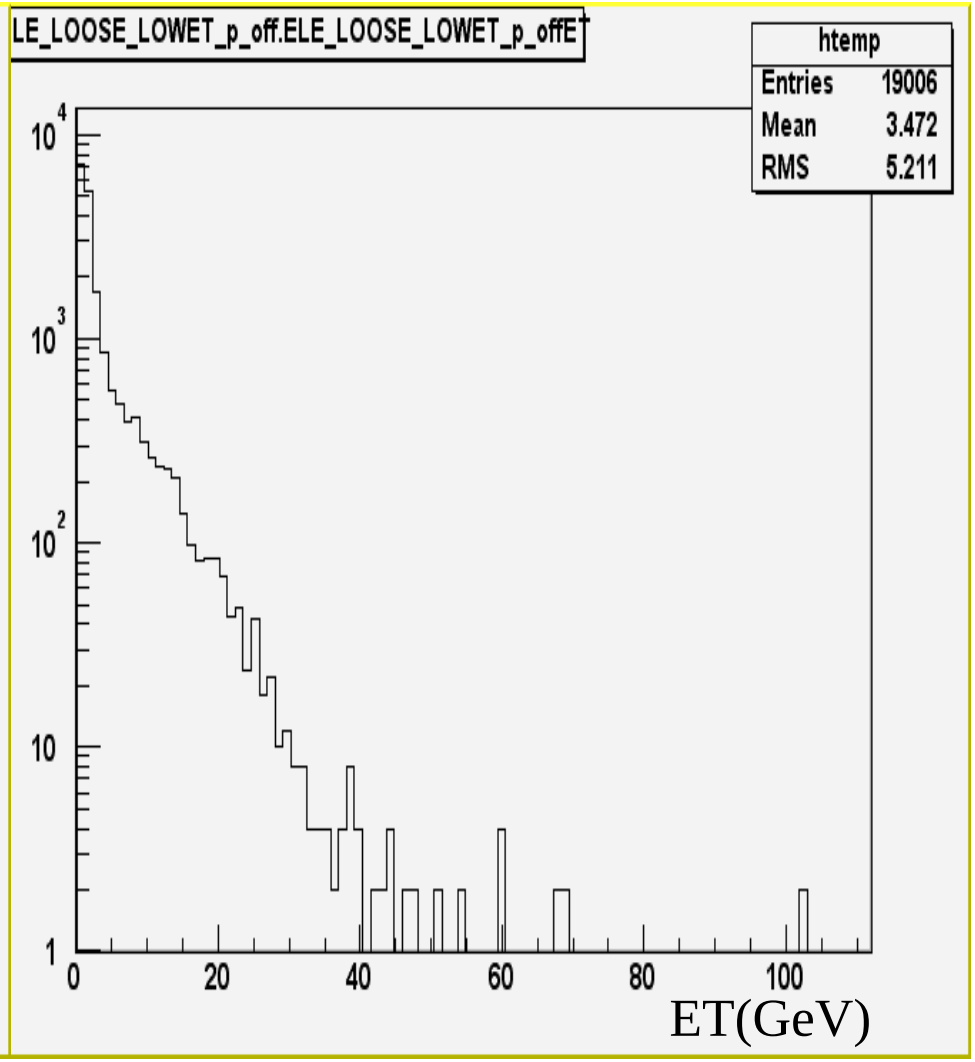


ELE_LOOSE_LOWET E_T

P13

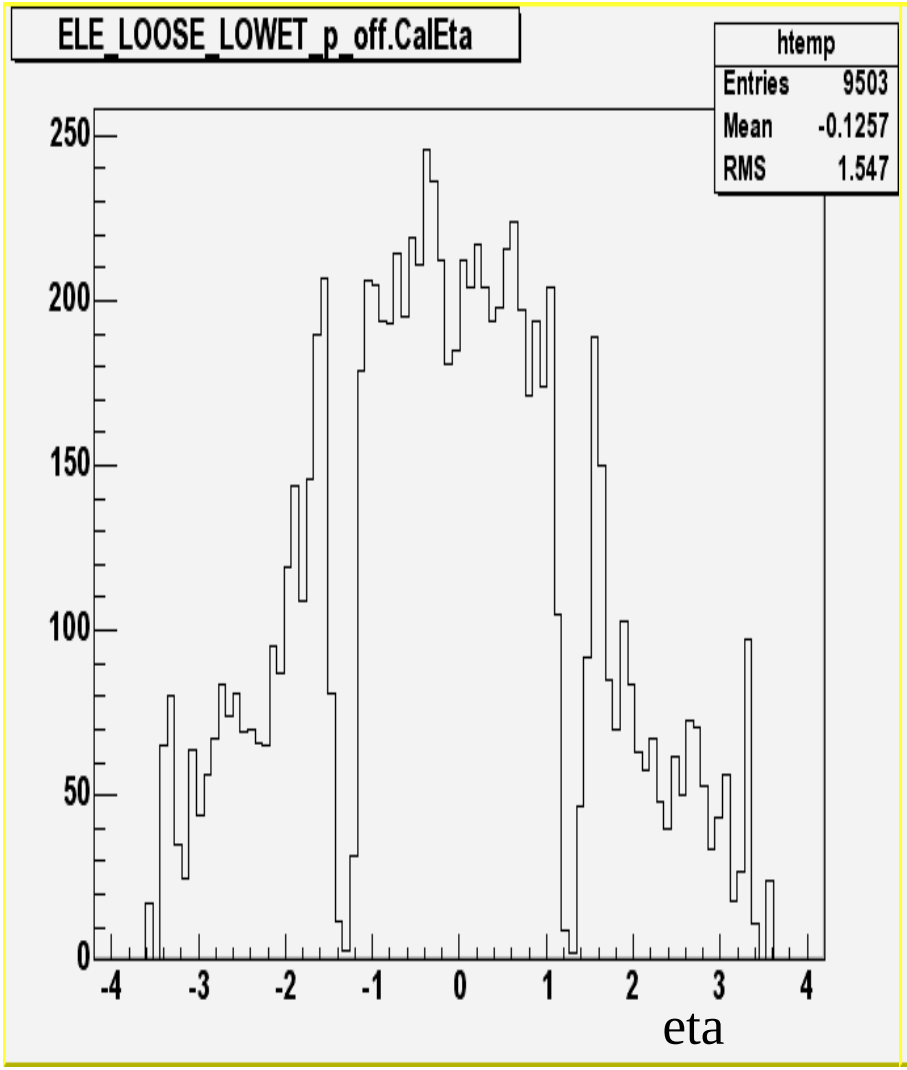


P15

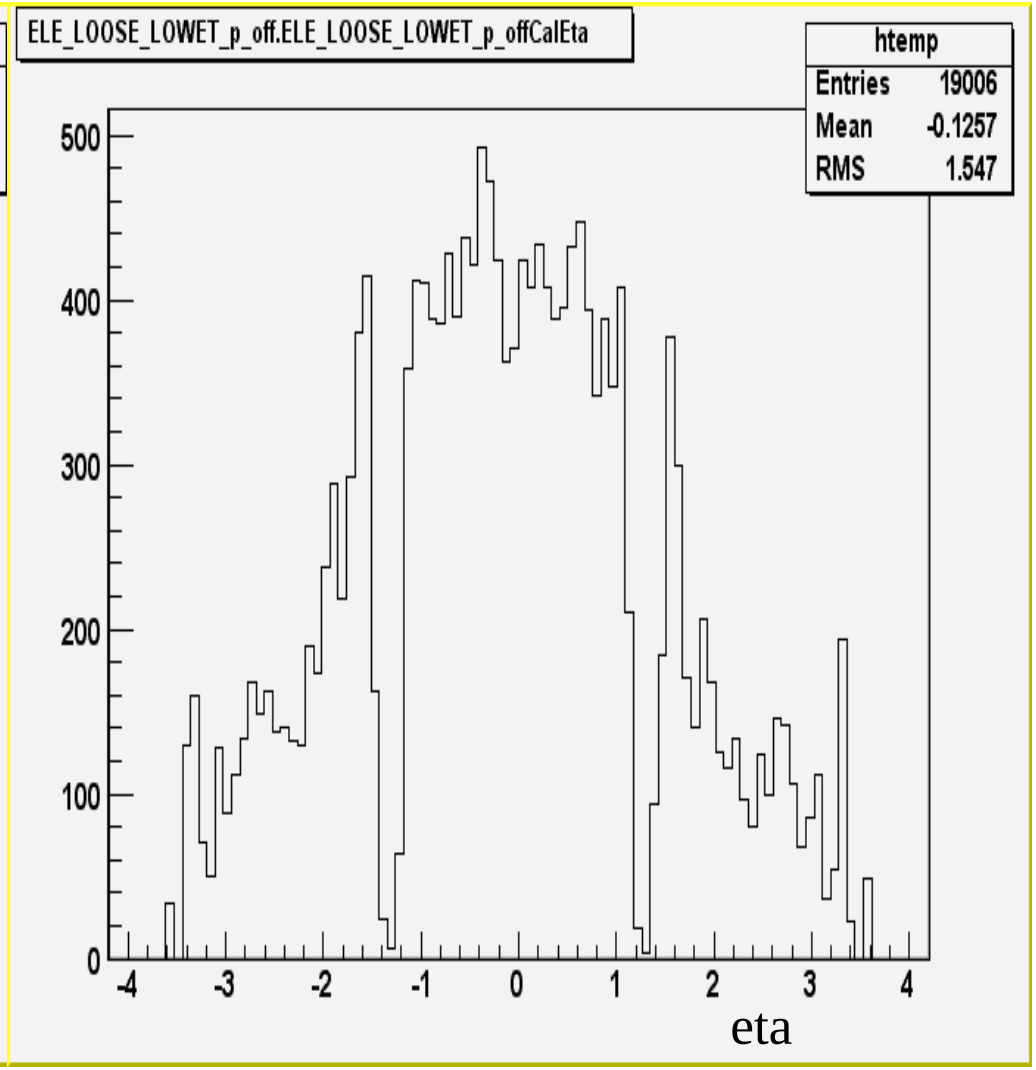


ELE_LOOSE_LOWET eta

P13

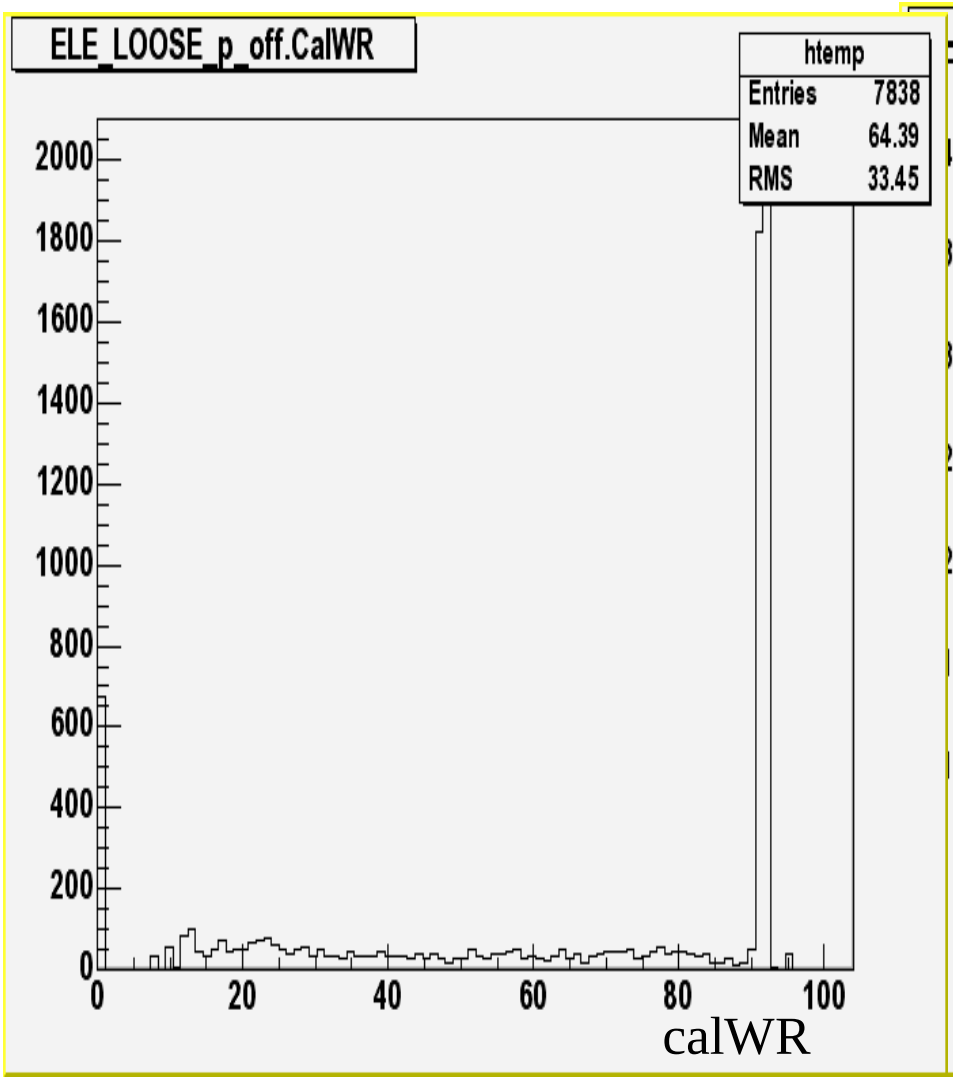


P15

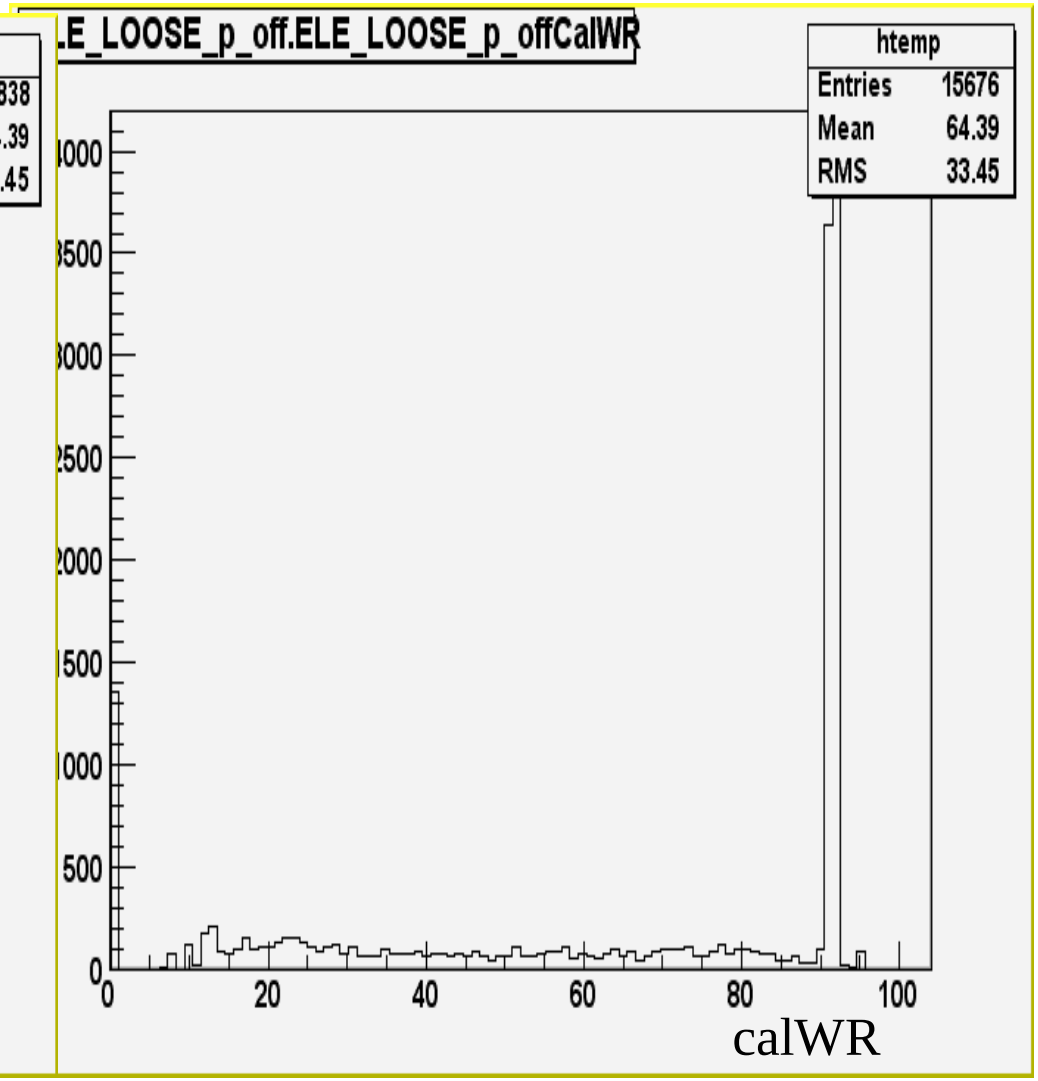


ELE_LOOSE calWR

P13



P15

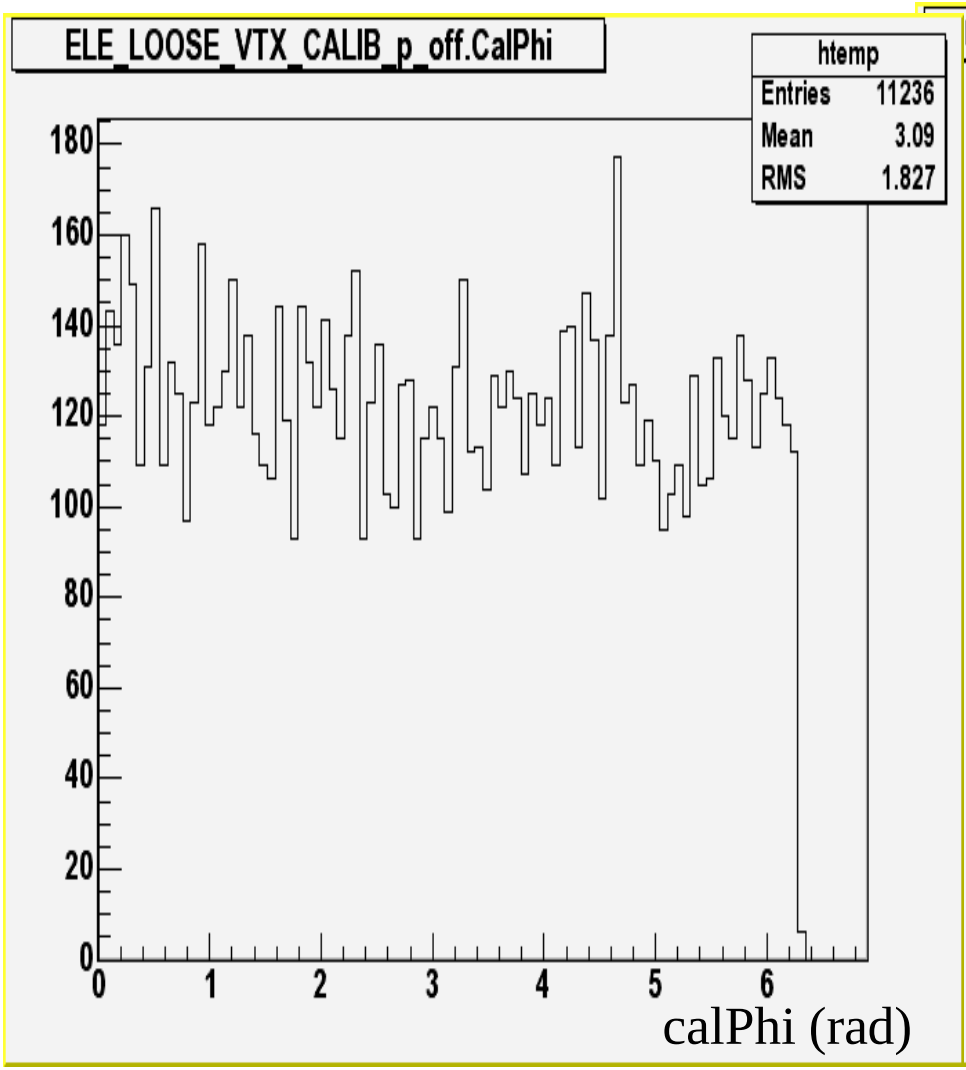


Including Vertex and Calibration

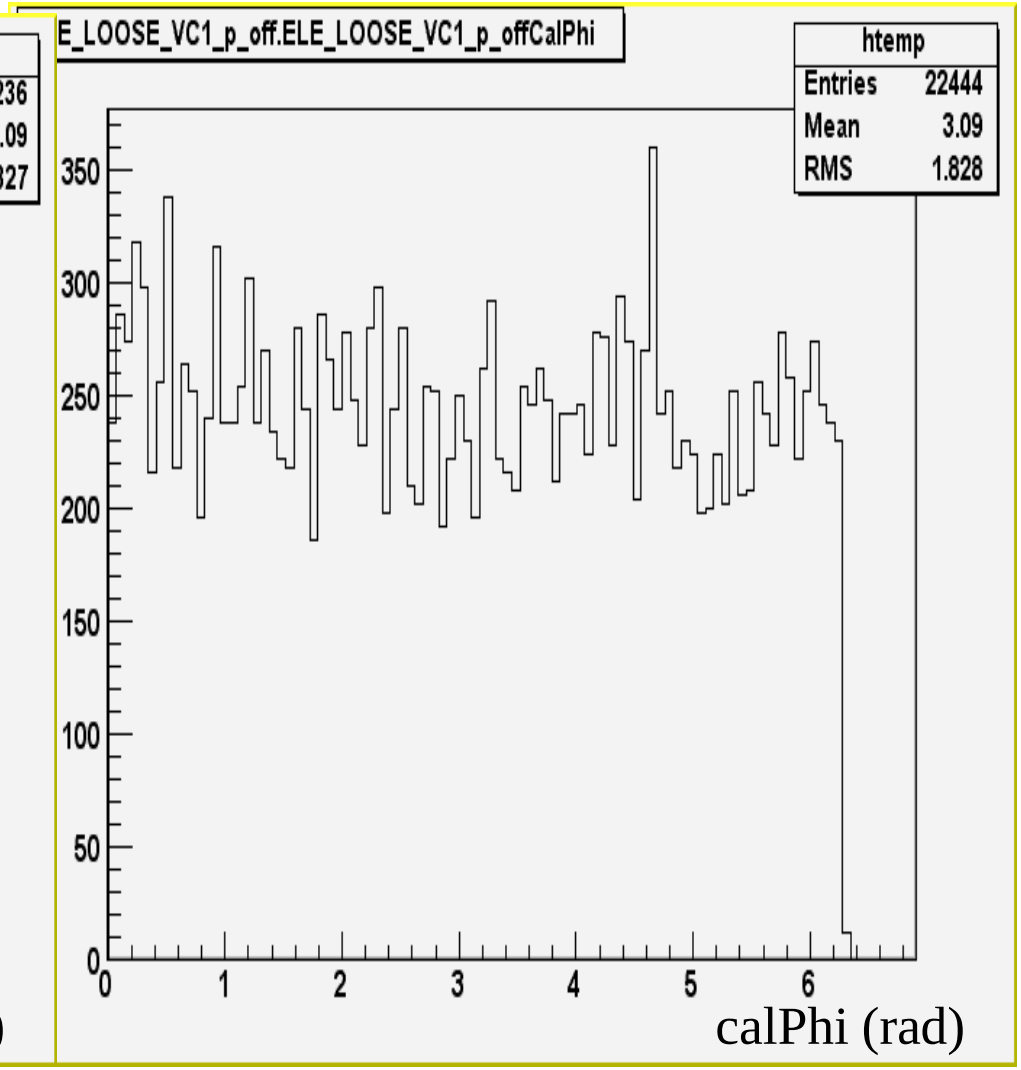
- Same comparison as before
  - ELE_LOOSE with vertex and calibration
- Small differences
  - Calibration update between p13 and p15
  - Vertex/tracking changes?
    - Small differences in Vertex Z position

ELE_LOOSE_VC phi

P13

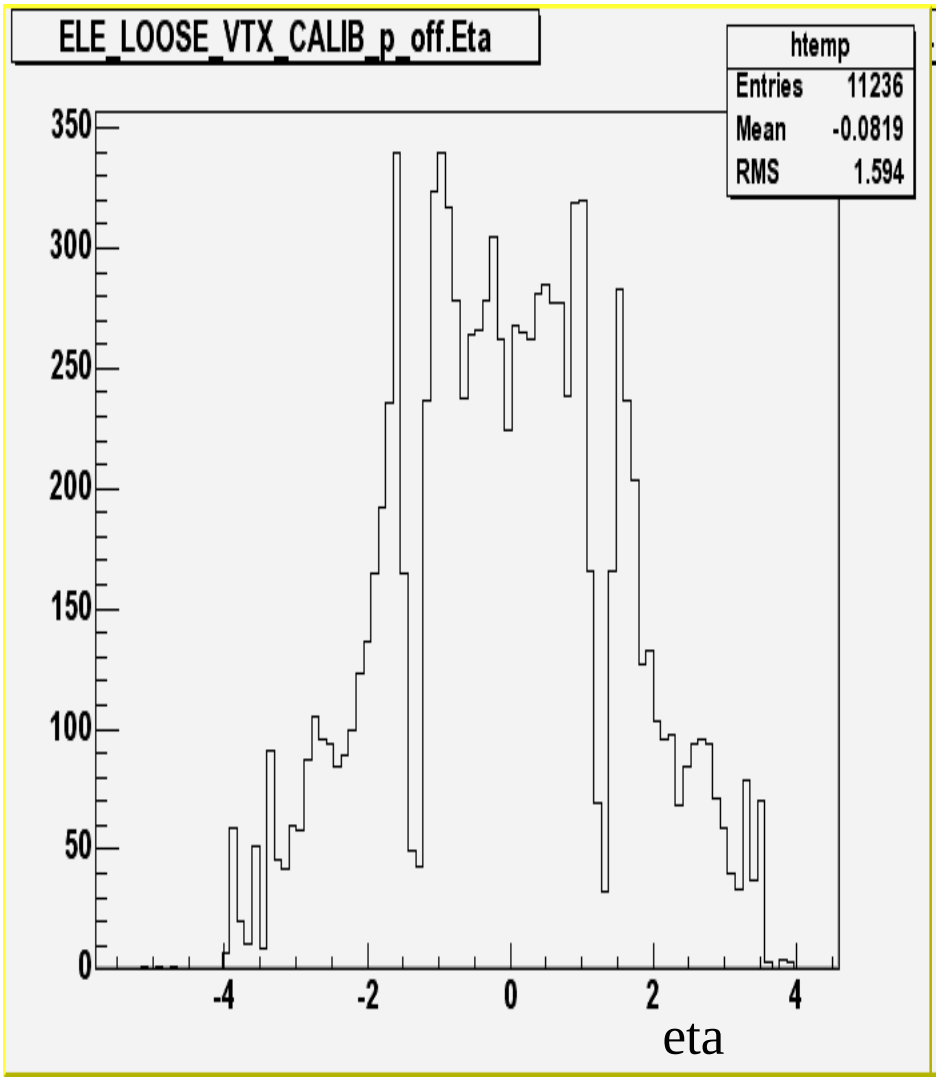


P15

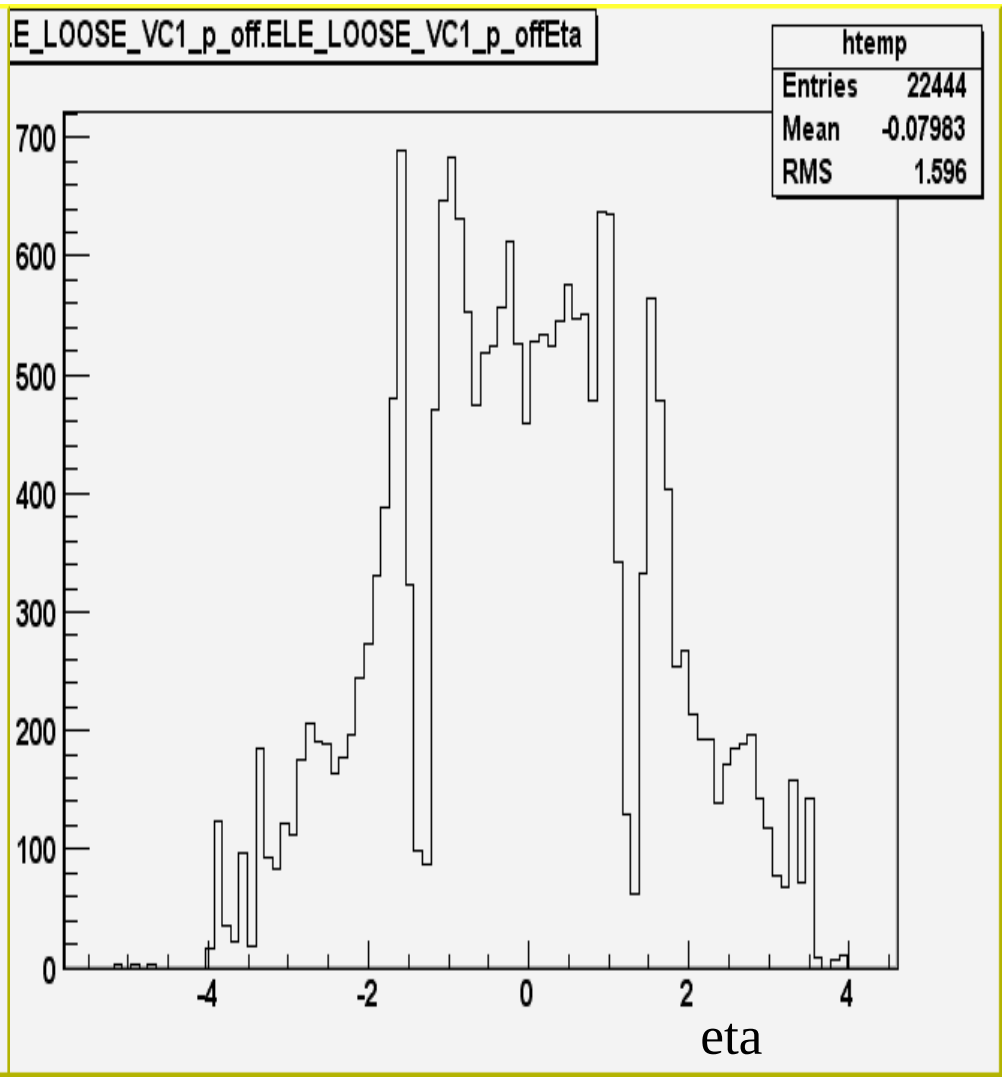


ELE_LOOSE_VC eta

P13

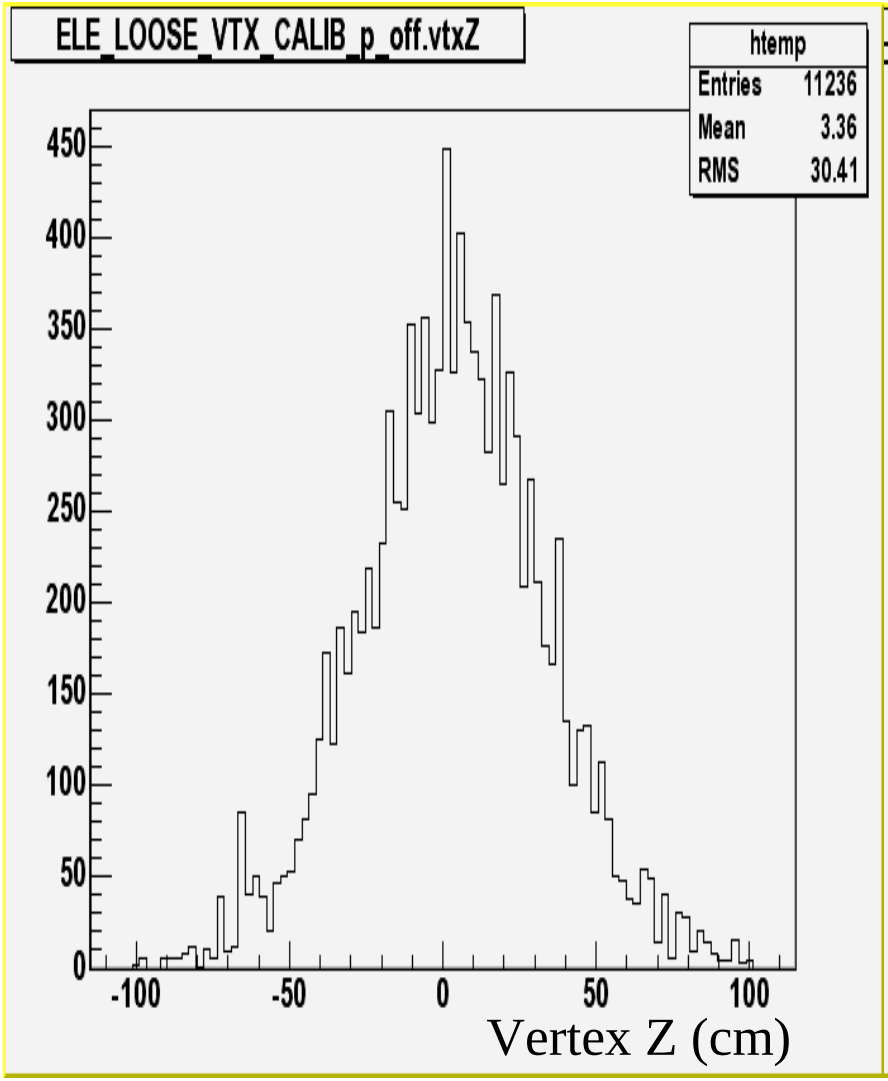


P15

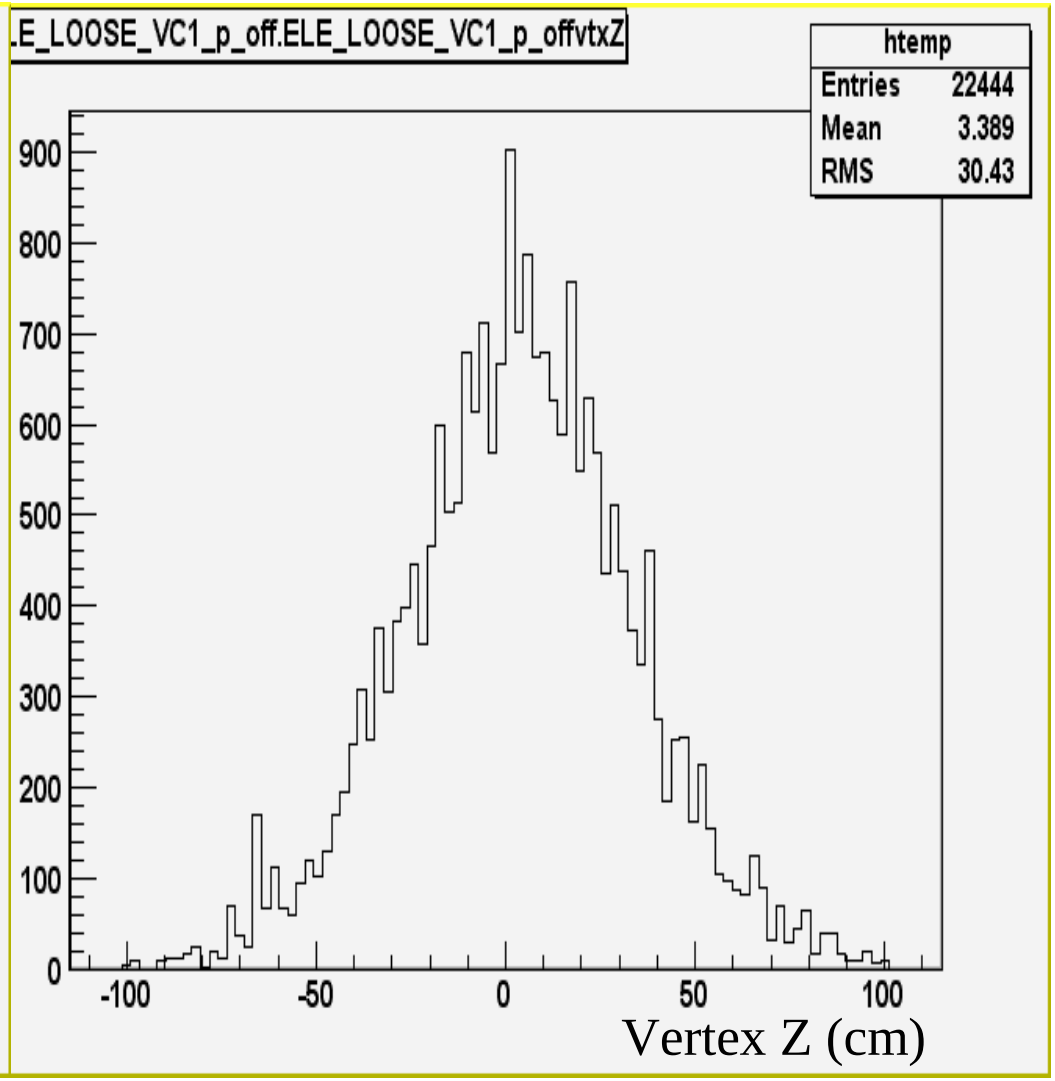


ELE_LOOSE_VC vtxZ

P13



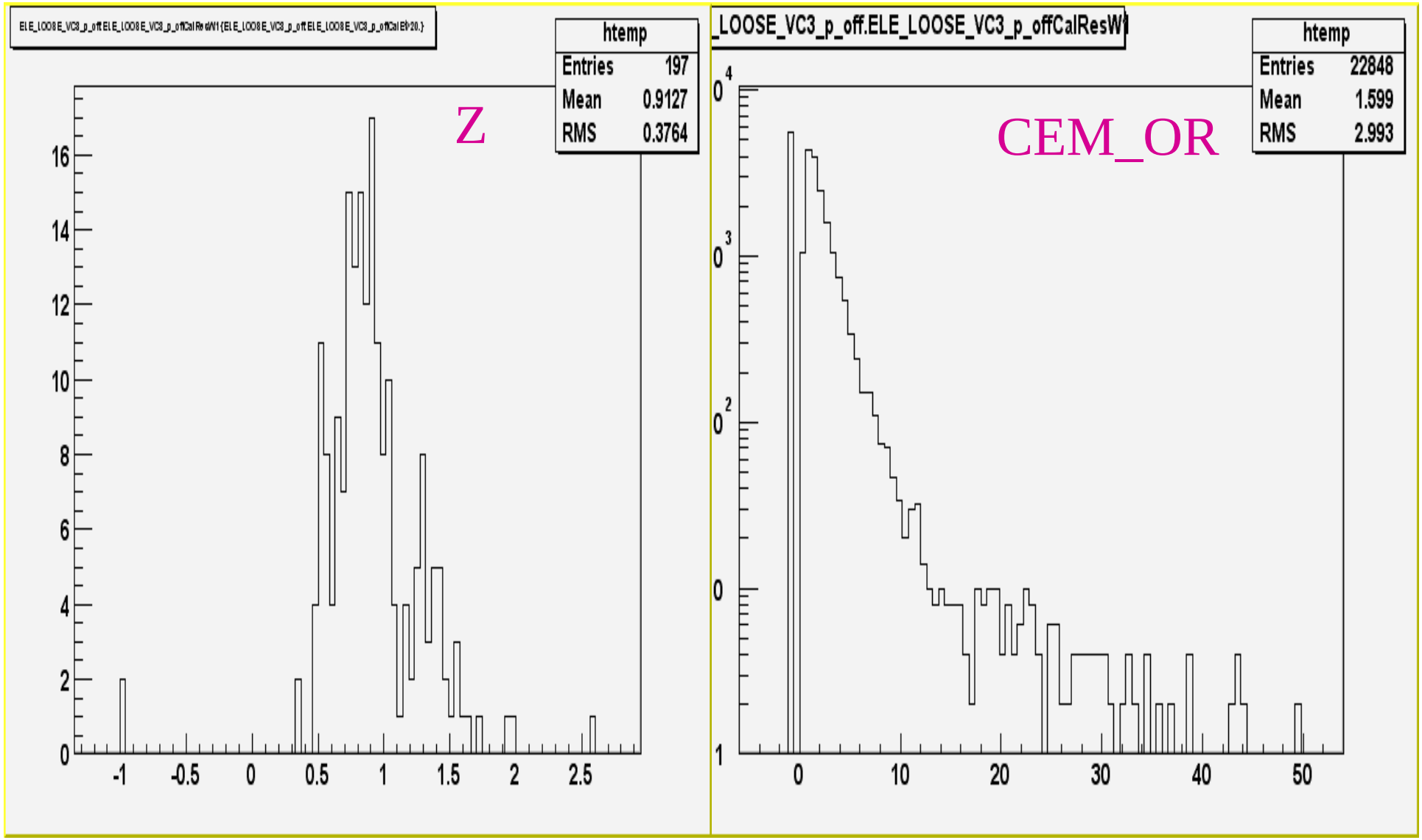
P15



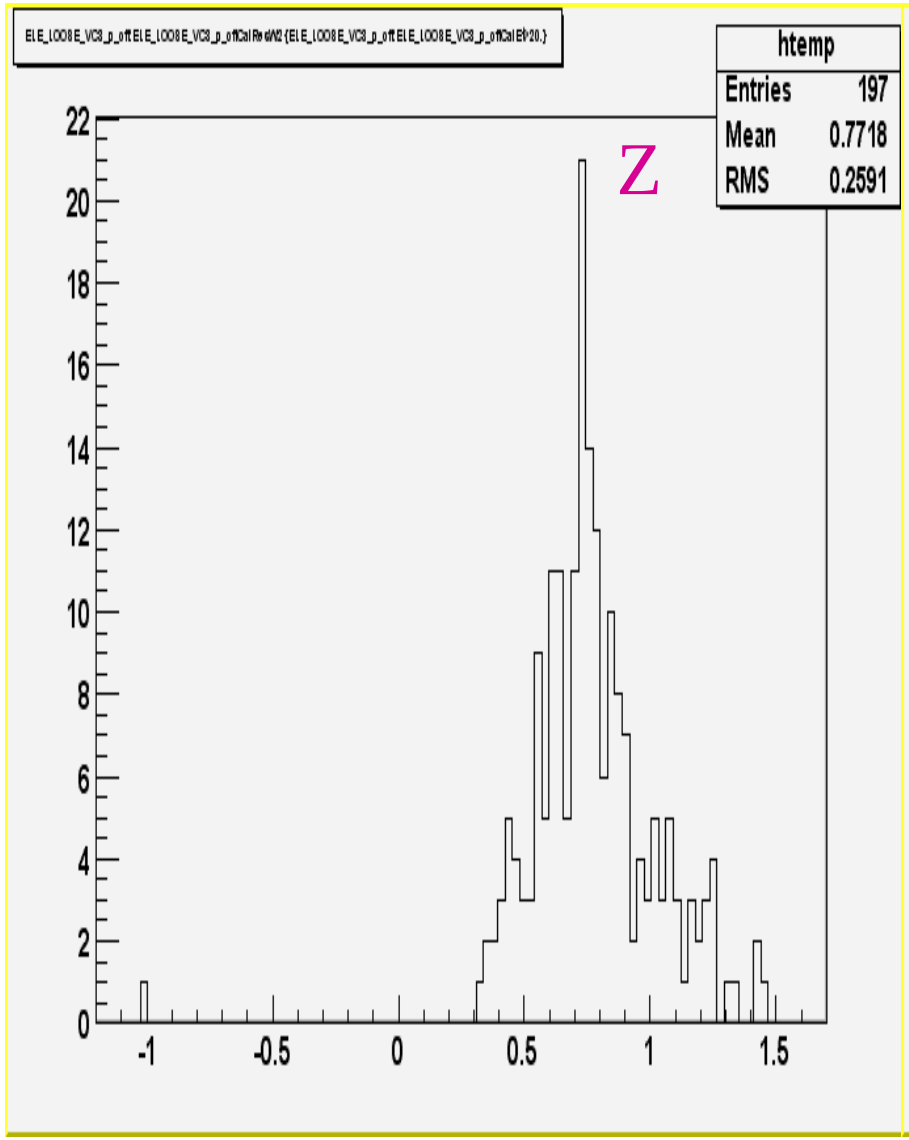
New ELE width variables

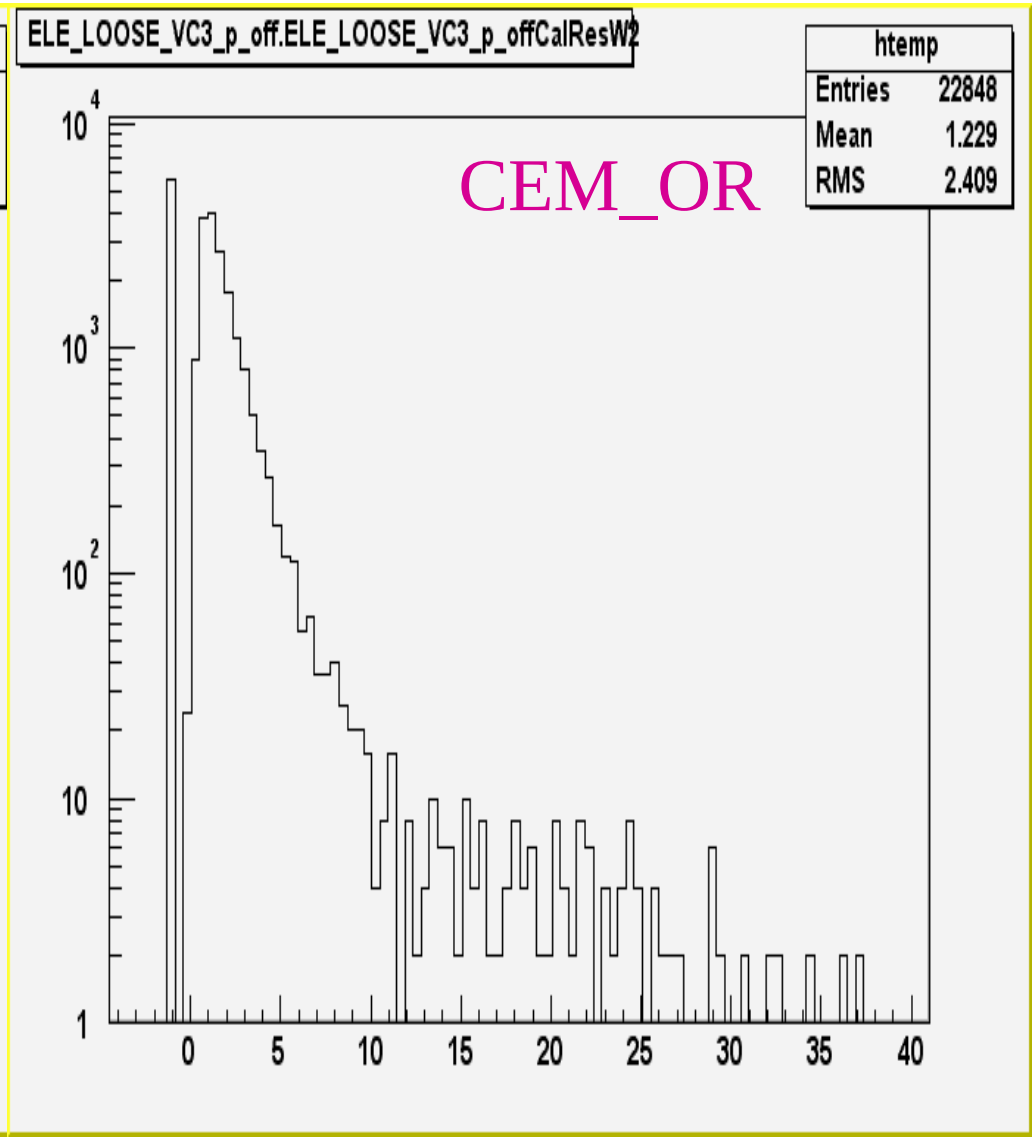
- New definition of cal width variables
  - Improved shower-shape cuts
- Compare background to signal
  - Di-EM Z sample
    - Select L3 electrons>20GeV
  - CEM_OR run

ELE_LOOSE_VC calResW1 (sh_t:<1.8)

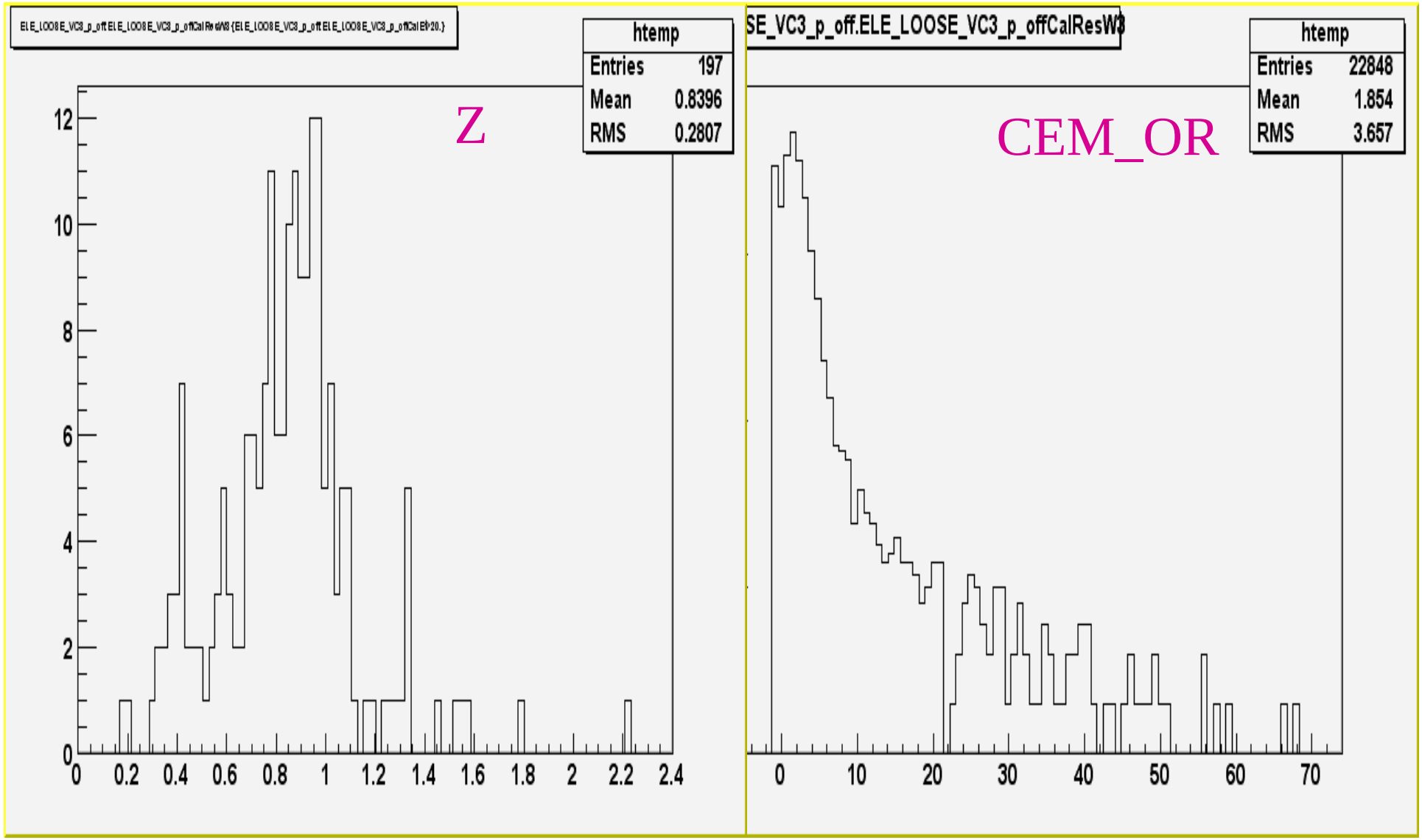


ELE_LOOSE_VC calResW2 (sh_t:<1.4)





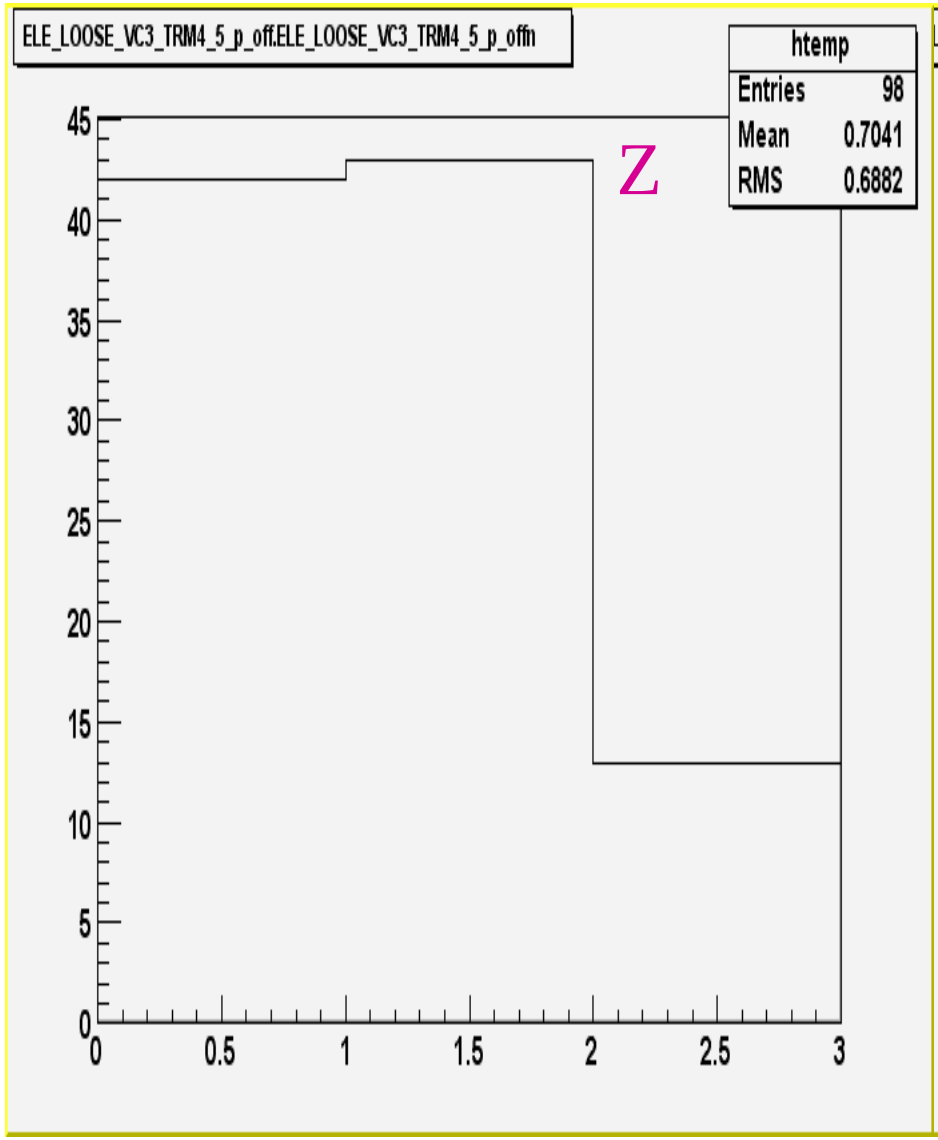
ELE_LOOSE_VC calResW3 (sh_t:<1.15)

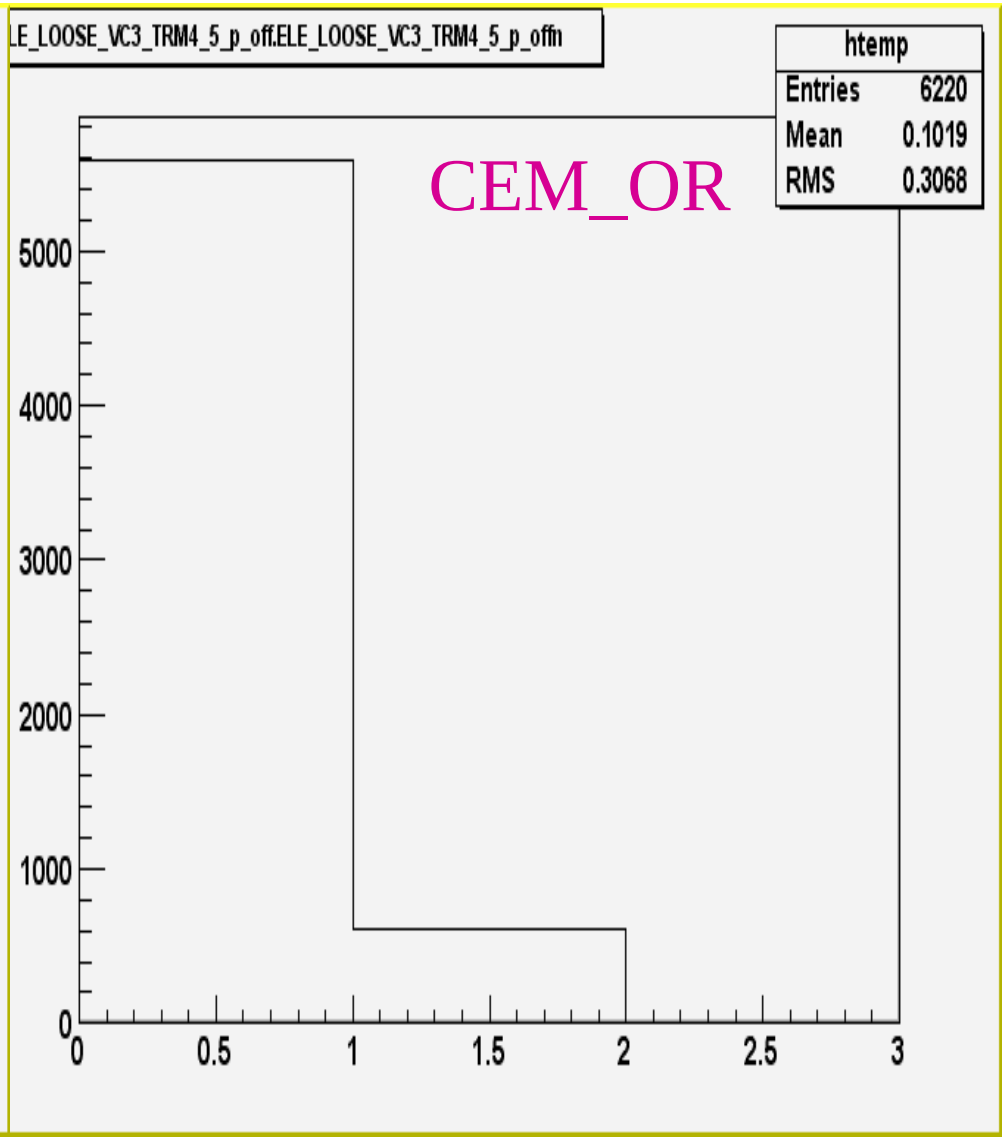


Track-matched L3 electrons

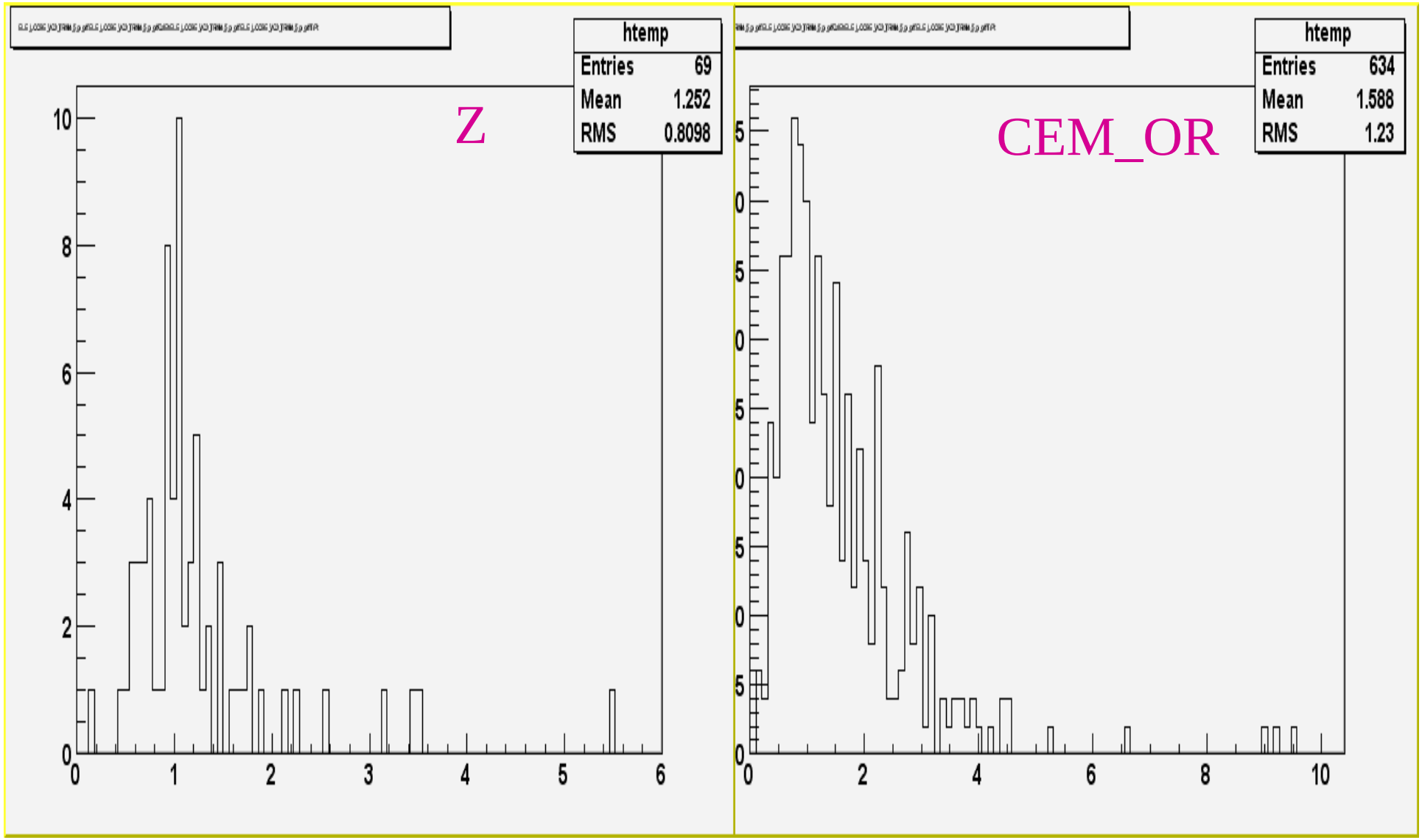
- Two algorithms:
  - Track-matching to Cal clusters
  - Road Method
- Comparisons
  - CAL quantities to Track quantities (ET and Phi)
  - Z sample to background (CEM_OR run)

Track-matched Electron: N

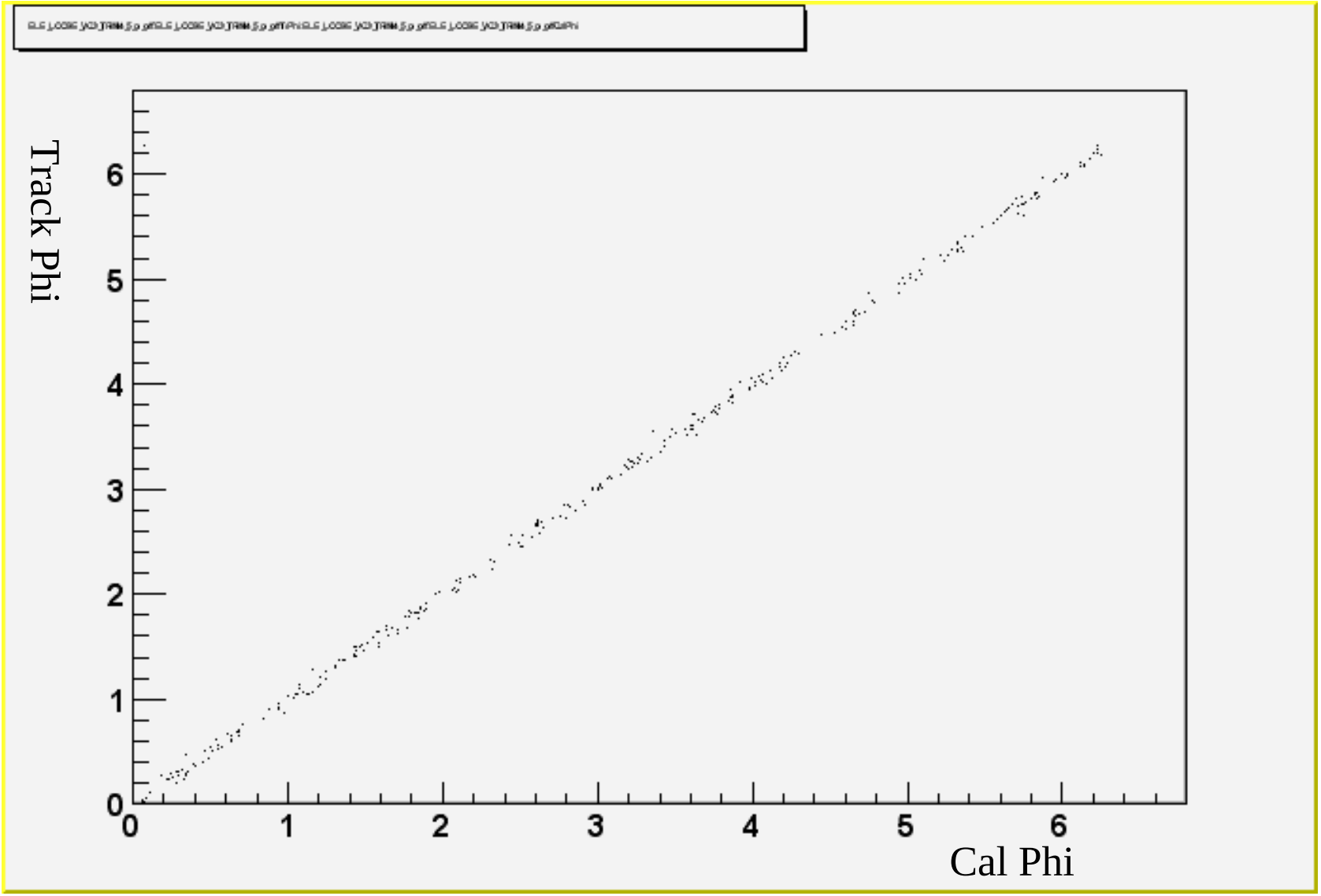




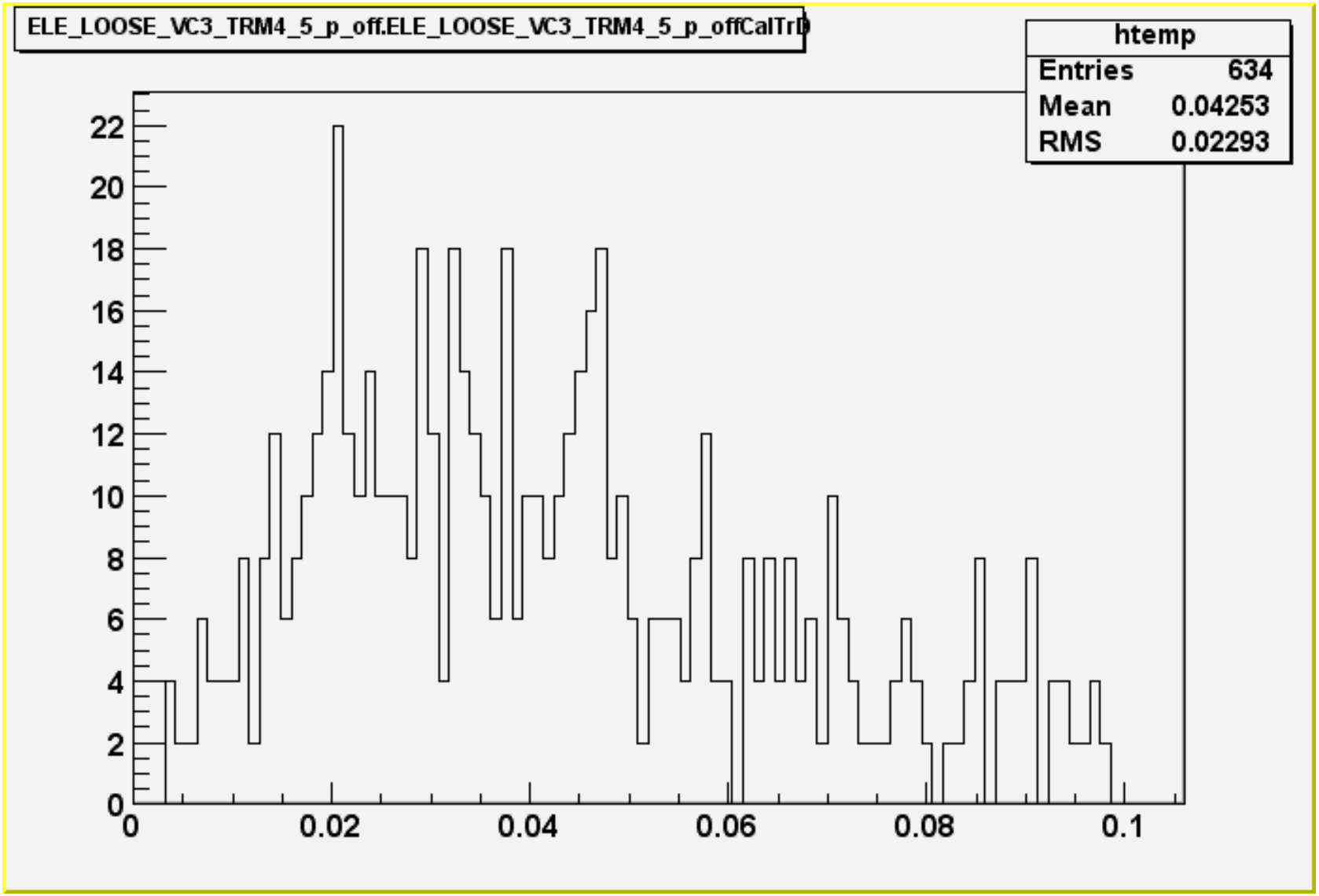
Track-matched Electron: Et/Pt



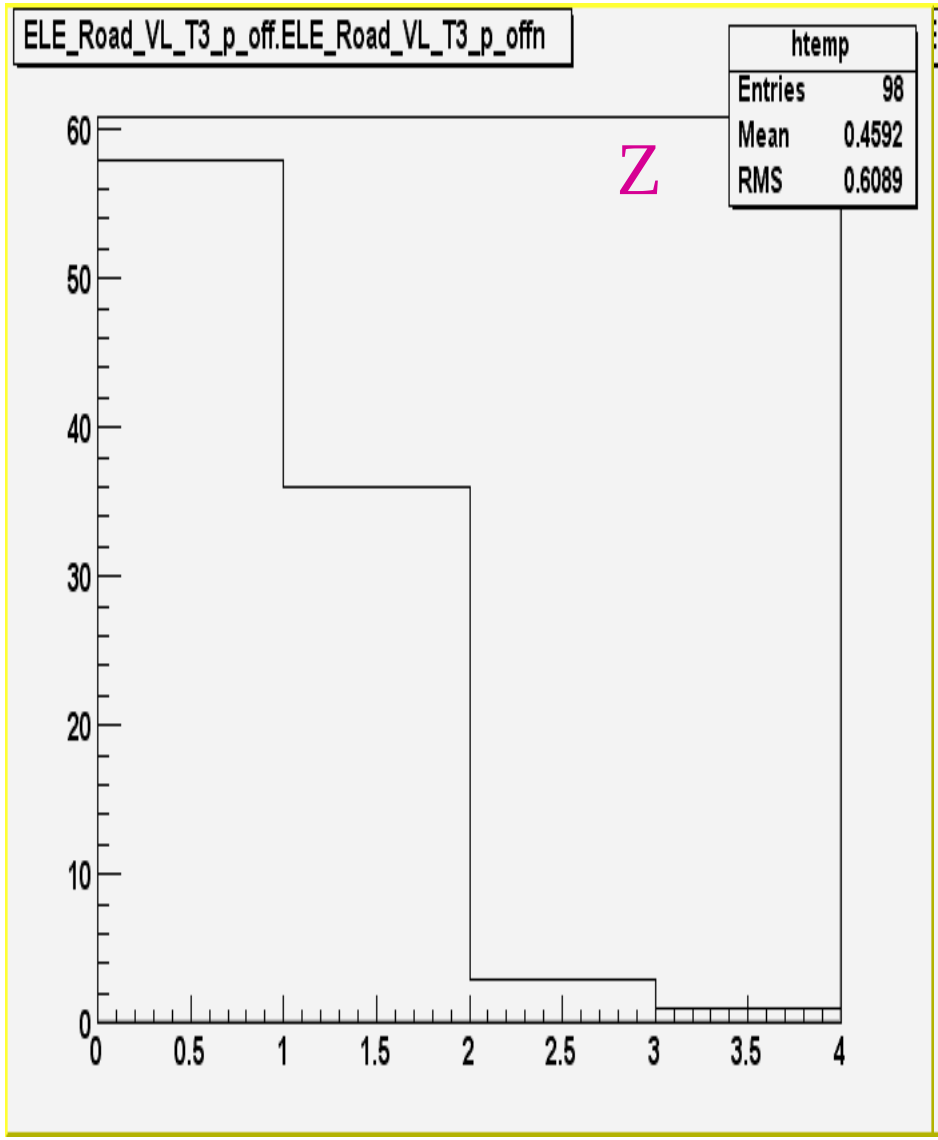
Track-matched Electron: Phi

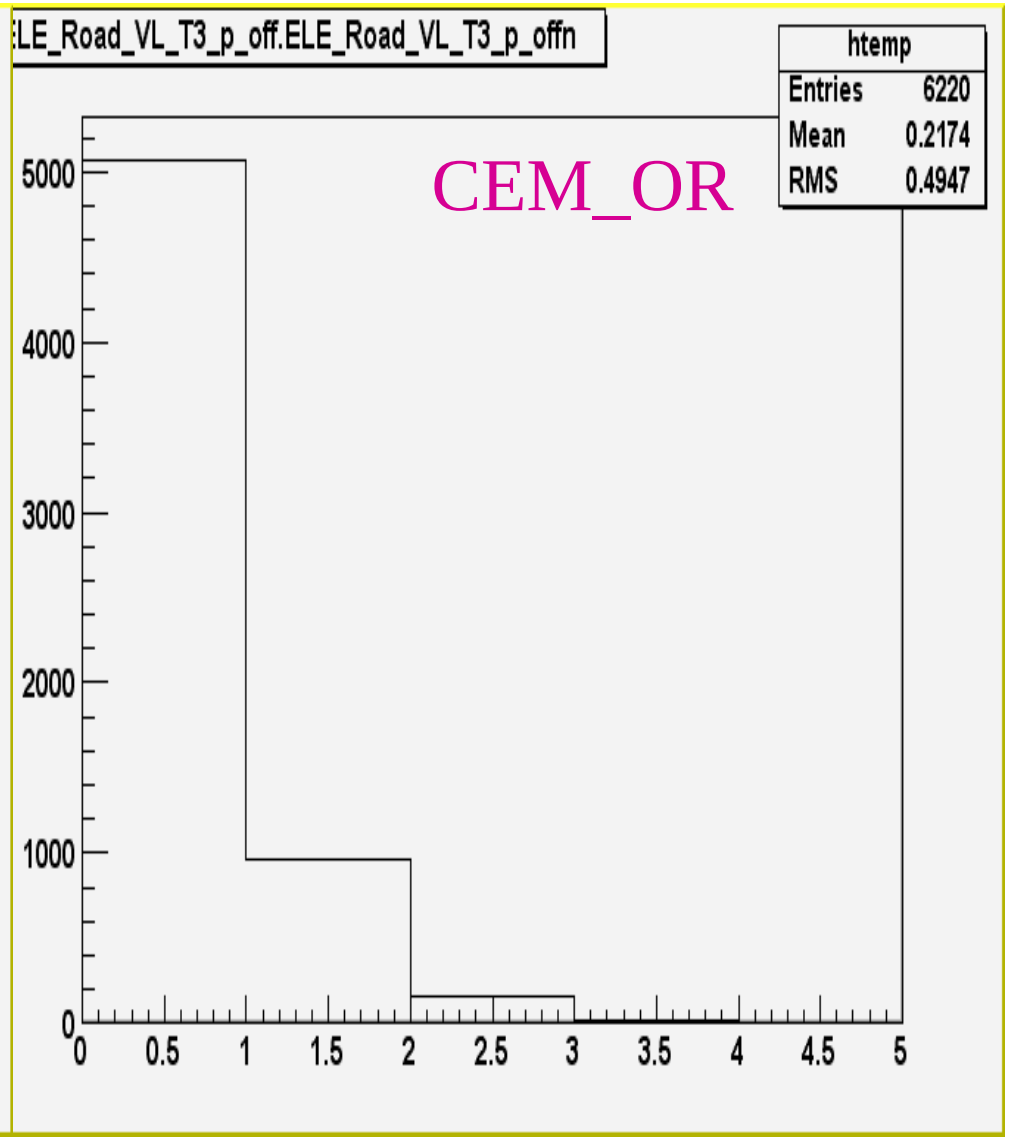


Track-matched Electron: CalTrack D

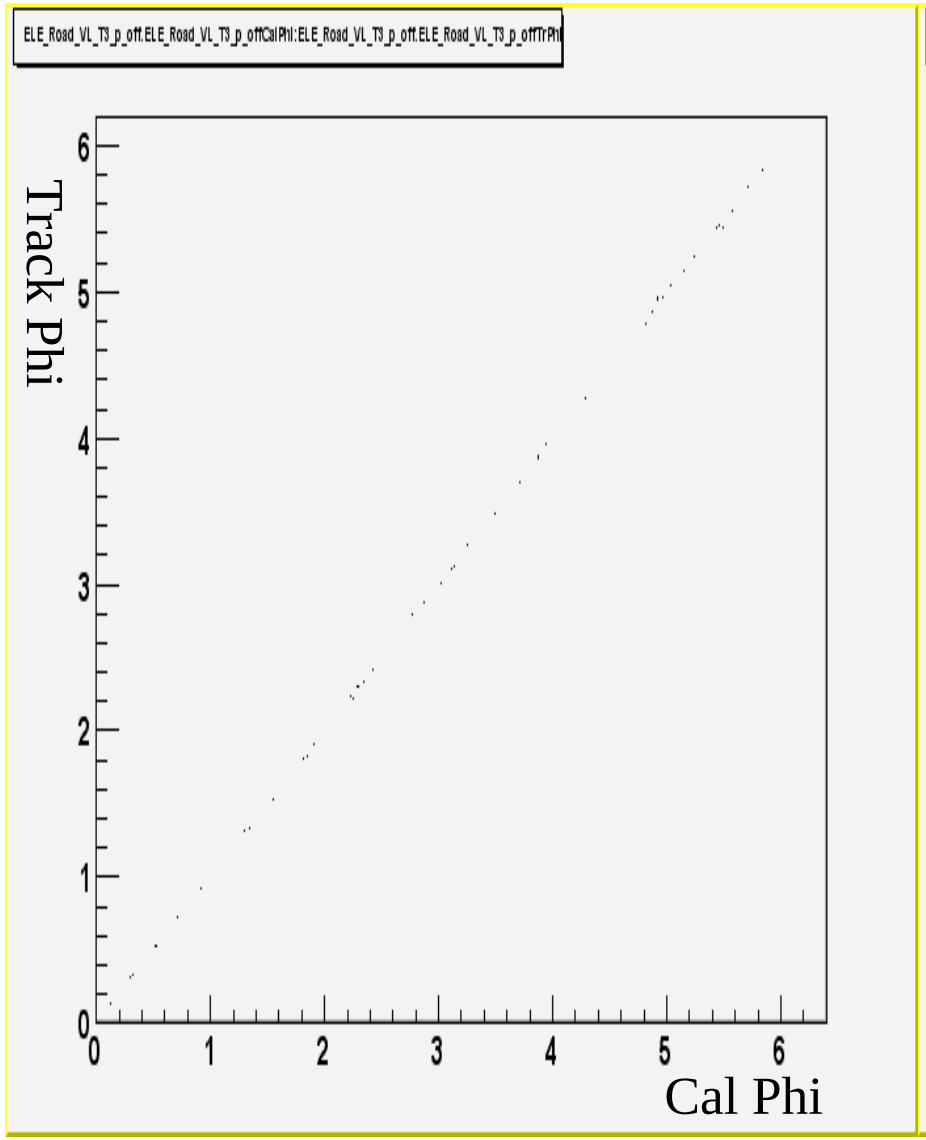


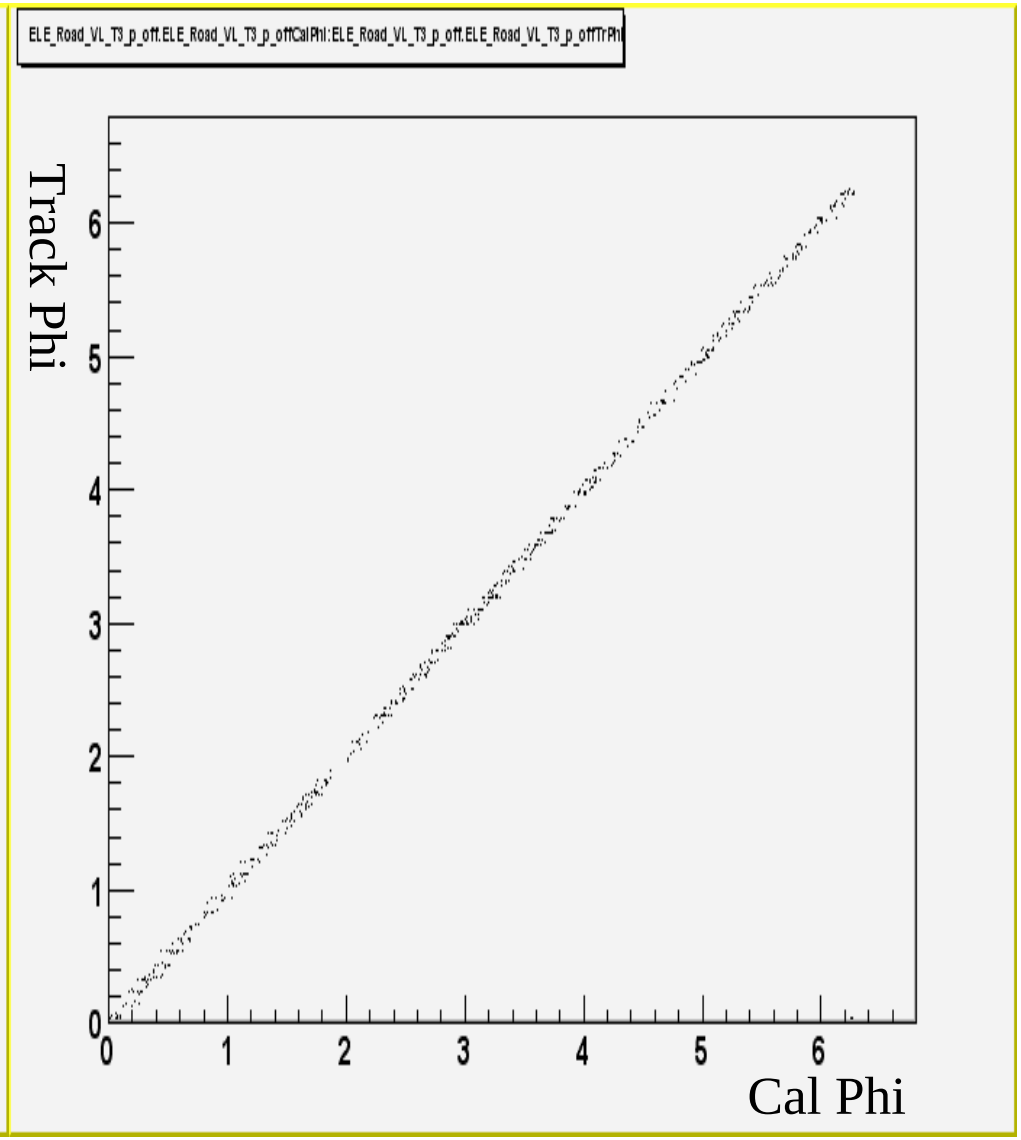
L3 Electron Road: N





L3 Electron Road Phi



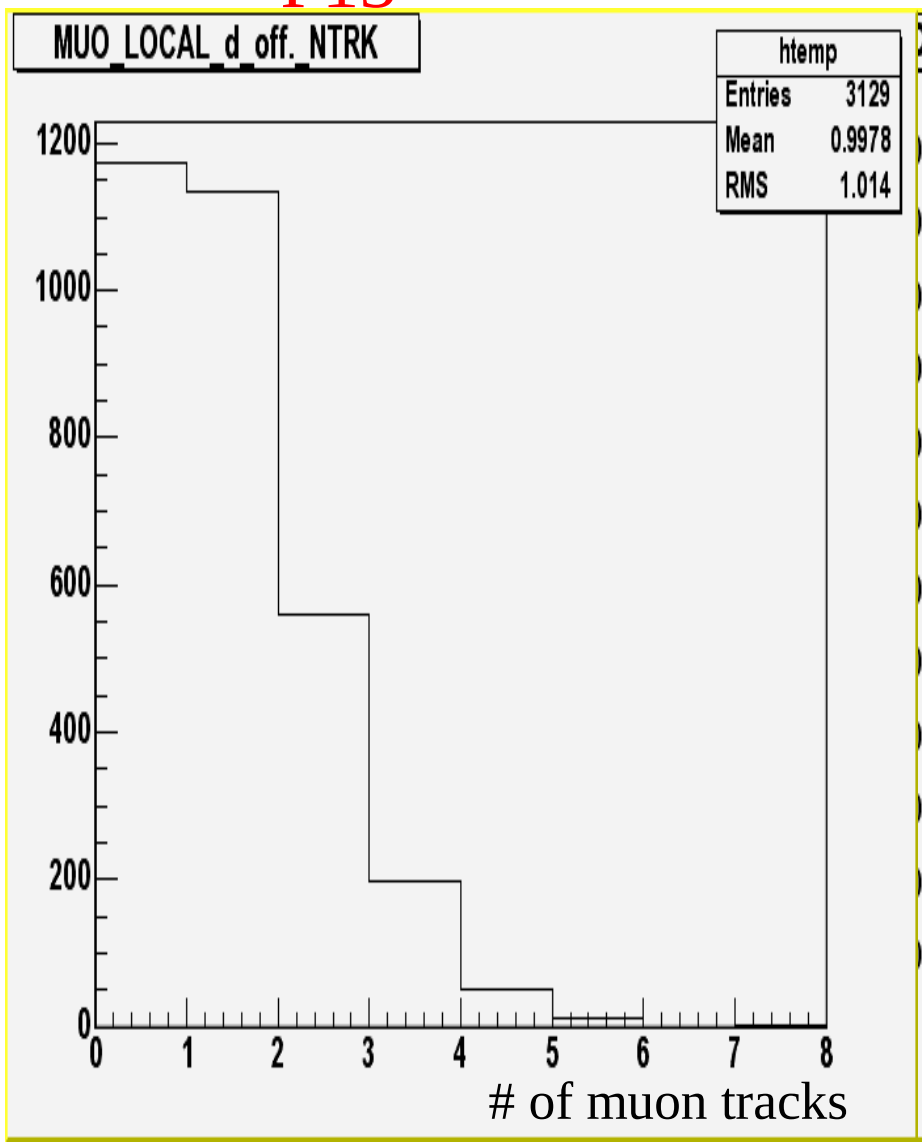


L3 Muon

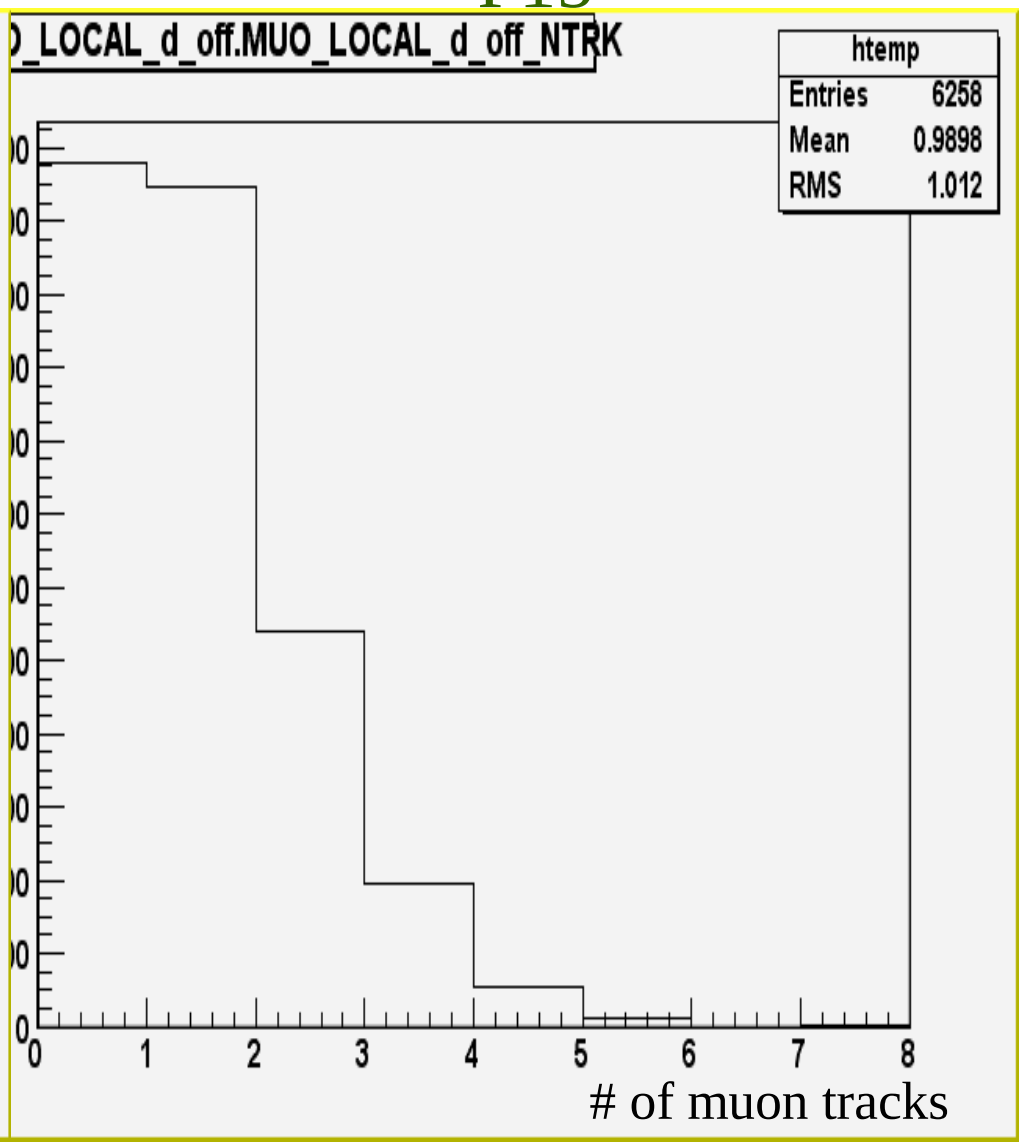
- From several samples
  - $Z \rightarrow \mu\mu$ TARC sample
  - CEM_OR run
- L3TMuoLocal and L3TMuon
  - P13-P15 results are very similar
- Many variables aren't filled in Root file
  - Unchanged from p13

MUO_LOCAL ntracks

P13

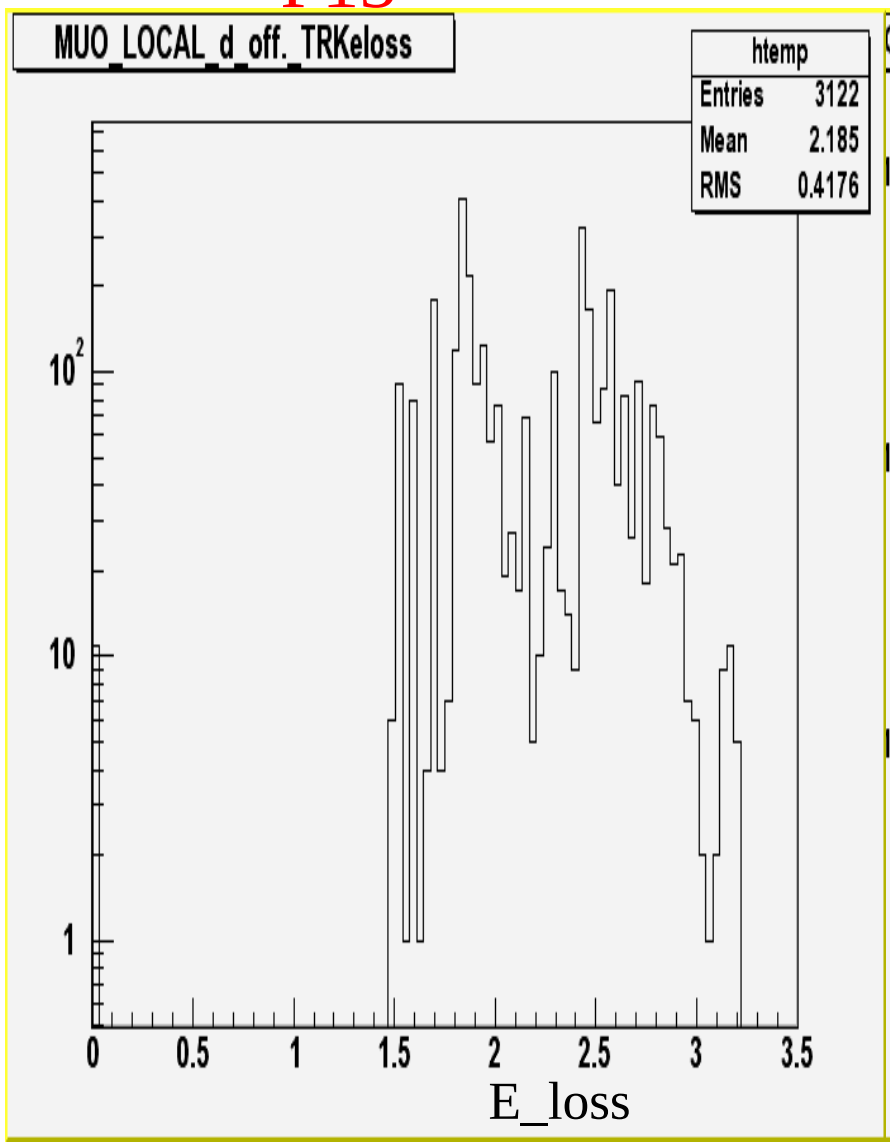


P15

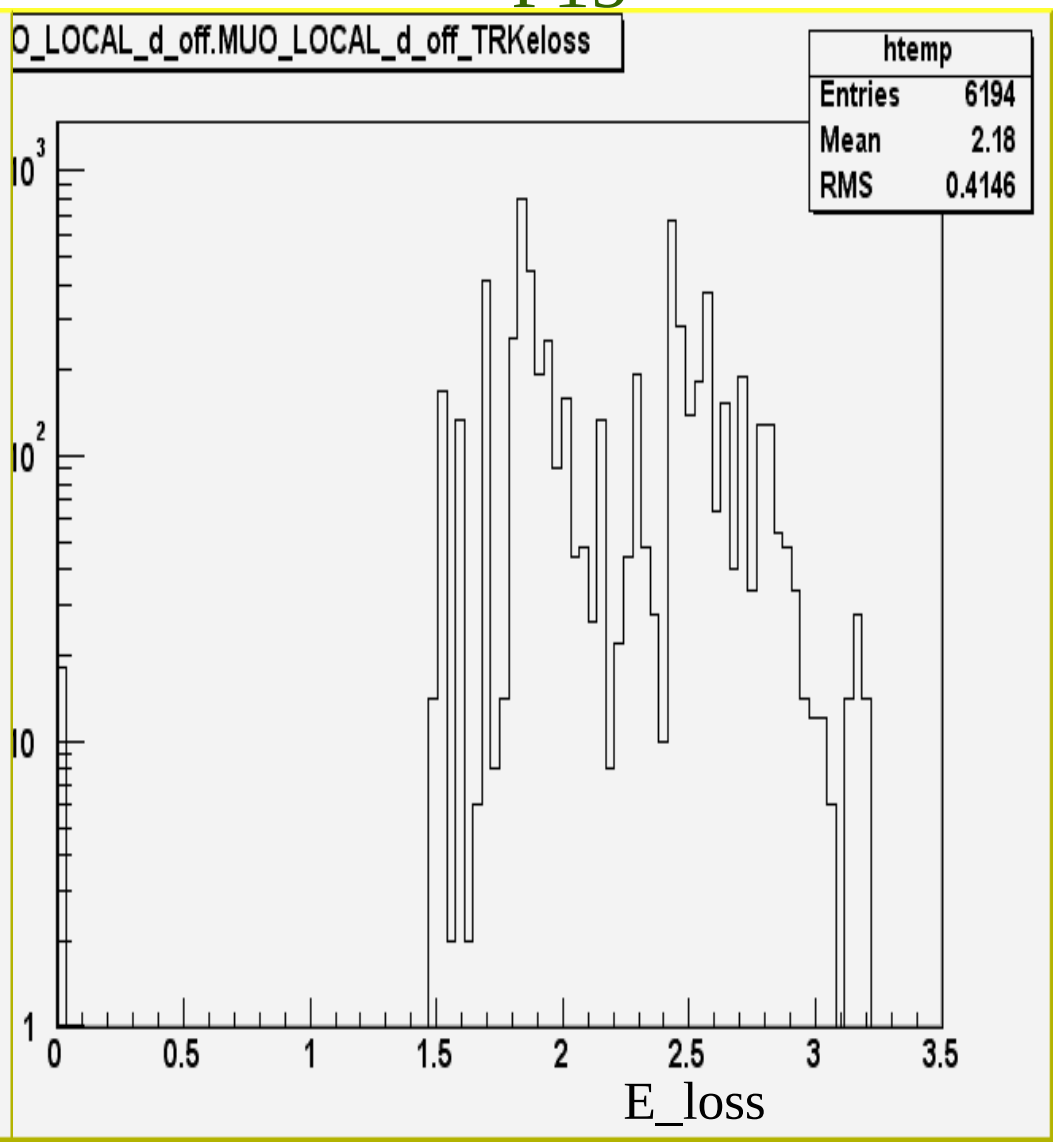


MUO_LOCAL E loss

P13

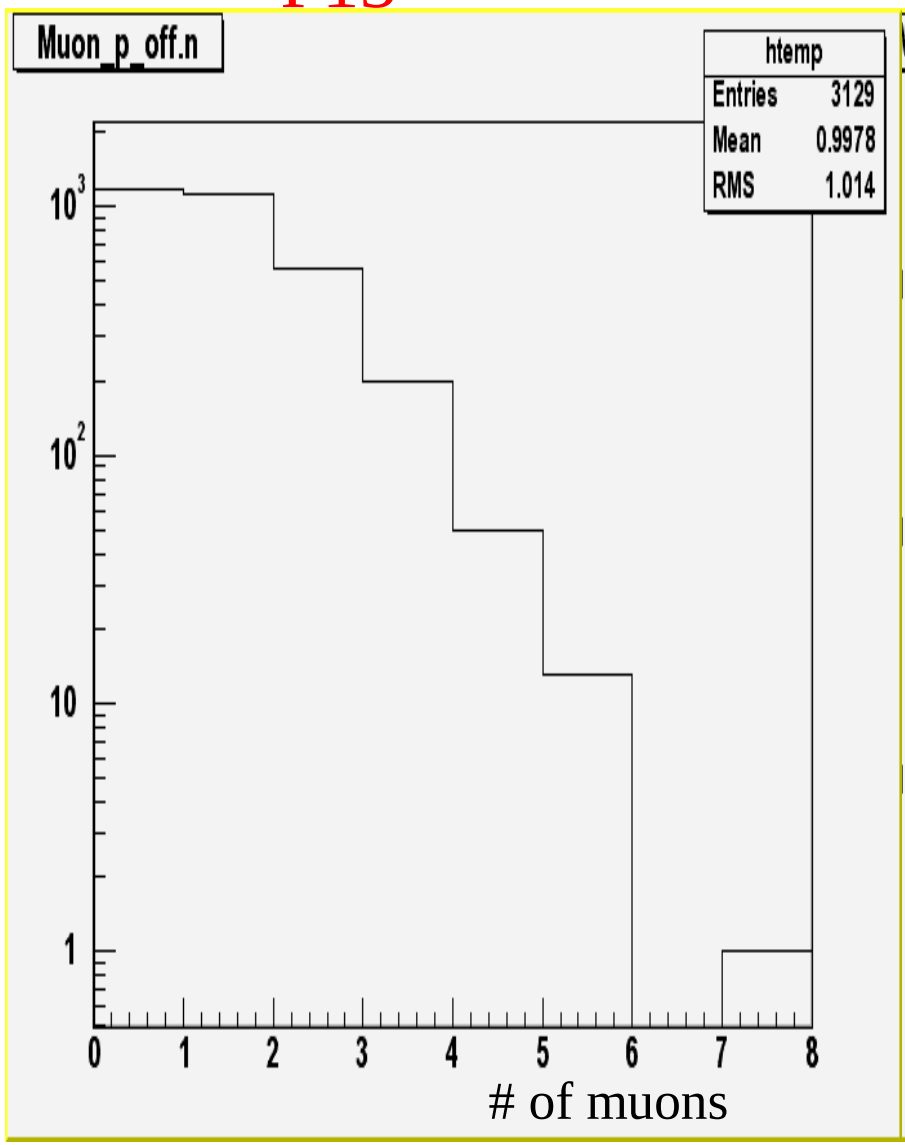


P15

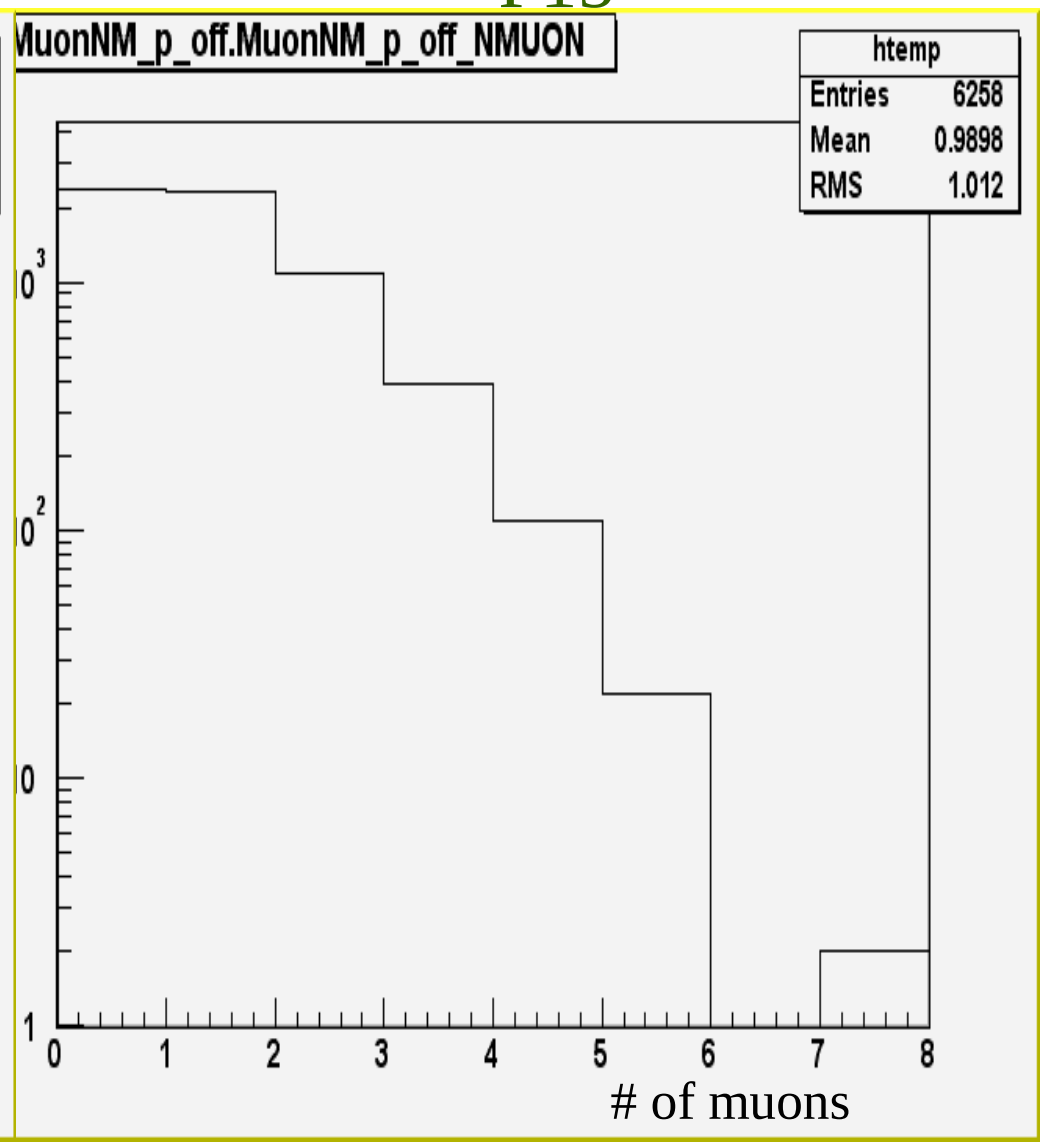


of L3 Muons

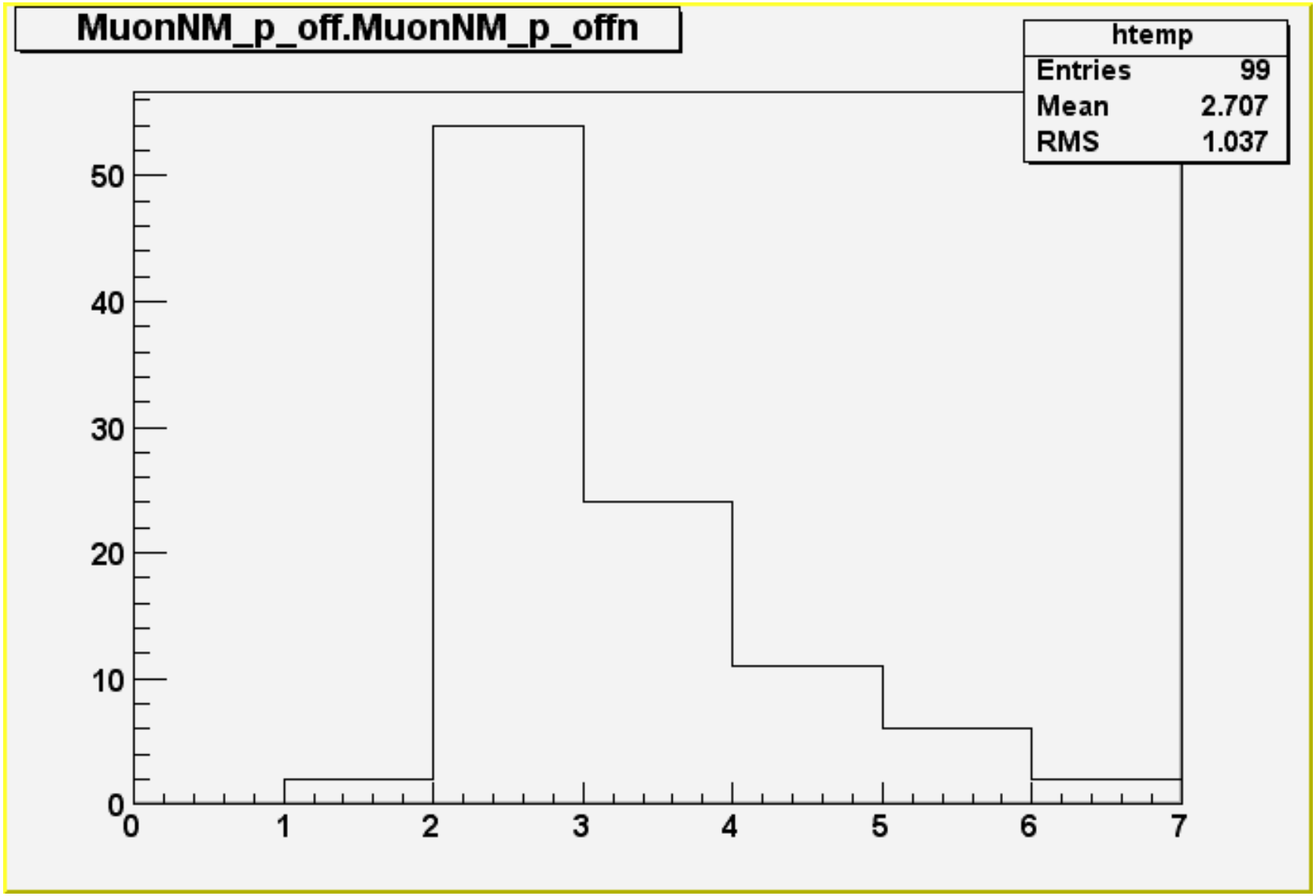
P13



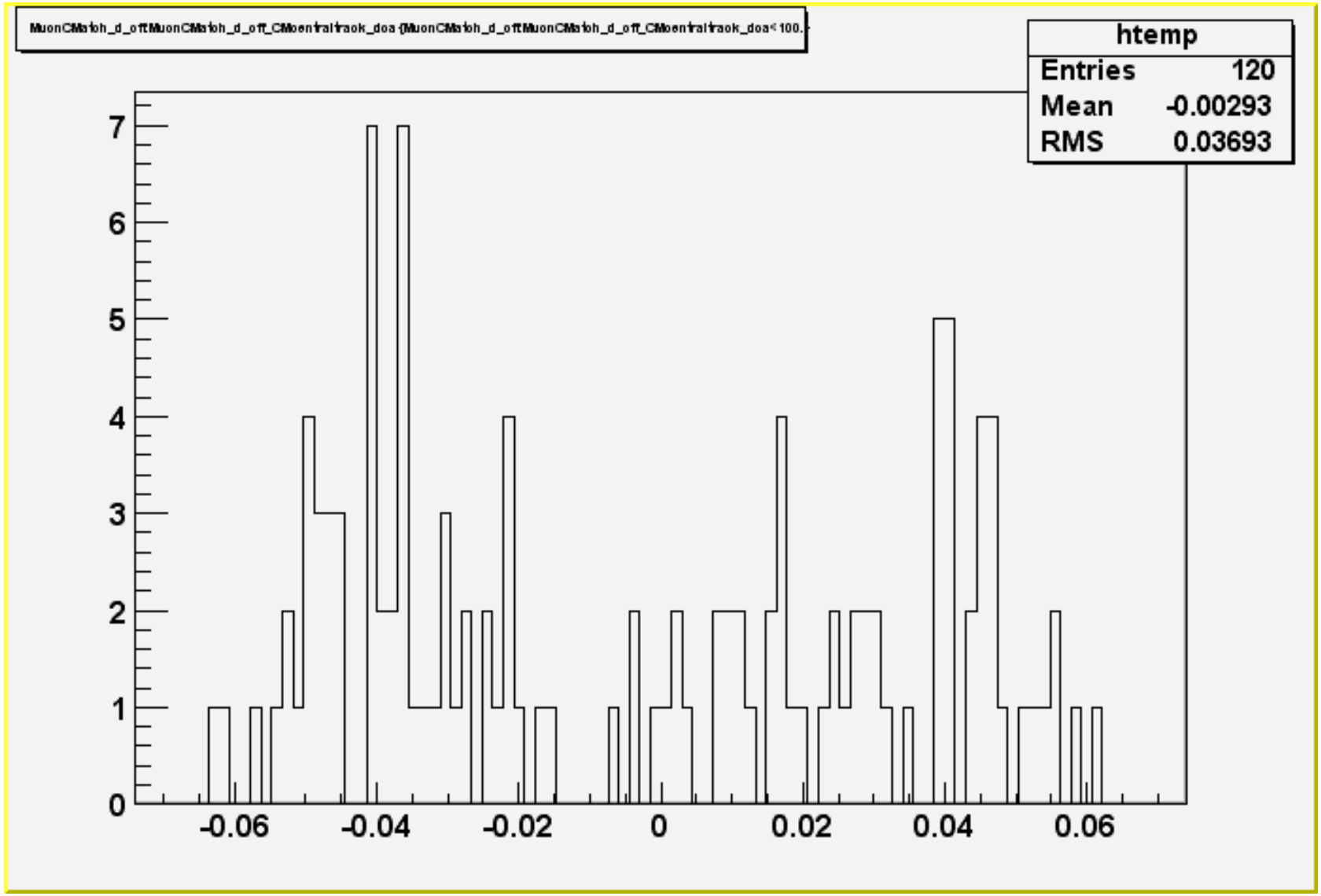
P15



Track-Matched Muons: N (Z sample)



Track-Matched Muons: Track DCA



Conclusions

- L3 p15.02.00 runs
  - Out of the box, maxopt
    - If ELE_NOCUT is disabled
- L3 Electron distributions agree between p13 and p15
  - Without vertex, NLC: perfect agreement
  - Small differences when including vertex, NLC
    - Some bug fixes, tools not used in p13
  - New features look ok in the root tuple
    - new shower-shape variables
    - Track matching, Road method
- L3 Muons look ok
  - Only comparing small number of variables