Status report &
Jet Energy Correction study

2014.09.05
Yeonju Go

Service tasks

- Central DCS shift
  : got 25 credit points.

Your shift assignment history:

Shift start	Shift end	Shift type	Weight
13-AUG-2014 15:00h	13-AUG-2014 23:00h	Central - DCS as main 2nd	1
12-AUG-2014 15:00h	12-AUG-2014 23:00h	Central - DCS as main 2nd	1
11-AUG-2014 15:00h	11-AUG-2014 23:00h	Central - DCS as main 2nd	1
07-AUG-2014 23:00h	08-AUG-2014 07:00h	Central - DCS as main 2nd	2
06-AUG-2014 23:00h	07-AUG-2014 07:00h	Central - DCS as main 2nd	2
05-AUG-2014 23:00h	06-AUG-2014 07:00h	Central - DCS as main 2nd	2
Monthly weight sum			9.0
31-JUL-2014 23:00h	01-AUG-2014 07:00h	Central - DCS as main 2nd	2
30-JUL-2014 23:00h	31-JUL-2014 07:00h	Central - DCS as main 2nd	2
29-JUL-2014 23:00h	30-JUL-2014 07:00h	Central - DCS as main 2nd	2
28-JUL-2014 23:00h	29-JUL-2014 07:00h	Central - DCS as main 2nd	2
16-JUL-2014 15:00h	16-JUL-2014 23:00h	Central - DCS as main 2nd	1
15-JUL-2014 15:00h	15-JUL-2014 23:00h	Central - DCS as main 2nd	1
14-JUL-2014 15:00h	14-JUL-2014 23:00h	Central - DCS as main 2nd	1
13-JUL-2014 07:00h	13-JUL-2014 15:00h	Central - DCS as main 2nd	1.5
12-JUL-2014 07:00h	12-JUL-2014 15:00h	Central - DCS as main 2nd	1.5
11-JUL-2014 07:00h	11-JUL-2014 15:00h	Central - DCS as trainee	1
10-JUL-2014 07:00h	10-JUL-2014 15:00h	Central - DCS as trainee	1
Monthly weight sum			16.0

Total weight sum: 25.0

- Pledge (total 4 months)

  1. Validation of JEC in Photon-jet events in pp, pPb and PbPb (2 months)

  2. Centrality studies of PbPb rereco data (2 months)
     : Estimation of event selection efficiency
     : UPC contamination studies

JEC Procedure

- merge all the pthat samples with appropriate weight factors.

  1. pthat : 30, 50, 80, 120, 170

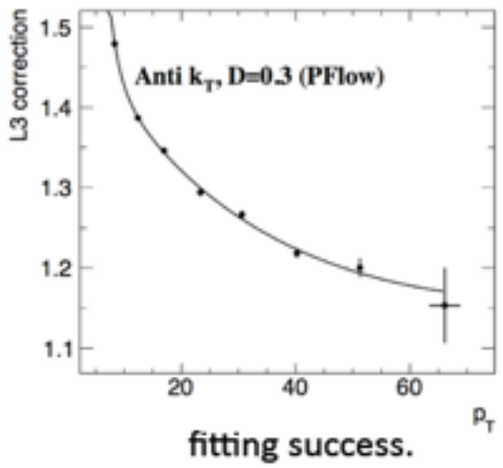
- get JEC factors with l2, l3 correction. (l5 correction could be investigated later)

  1. l2 relative correction that makes the jet response uniform in η, by calibrating, on average, to the response in the central region of the calorimeters ($|\eta| < 1.3$)

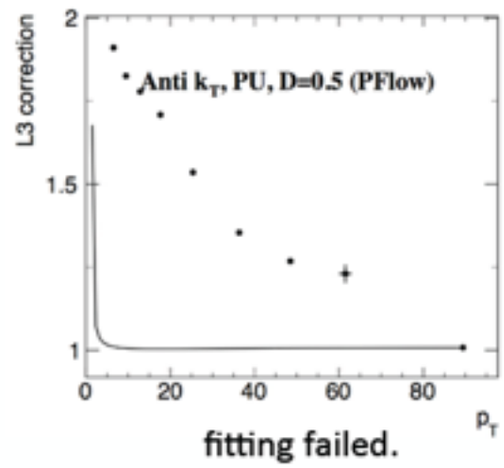
  2. l3 absolute correction that removes the pT dependence of the jet response.

  3. l2, l3 correction need right fitting

EX)



fitting success.



fitting failed.

- closure test (as a function of pt, eta, phi, … and so on) with different jet algorithm.

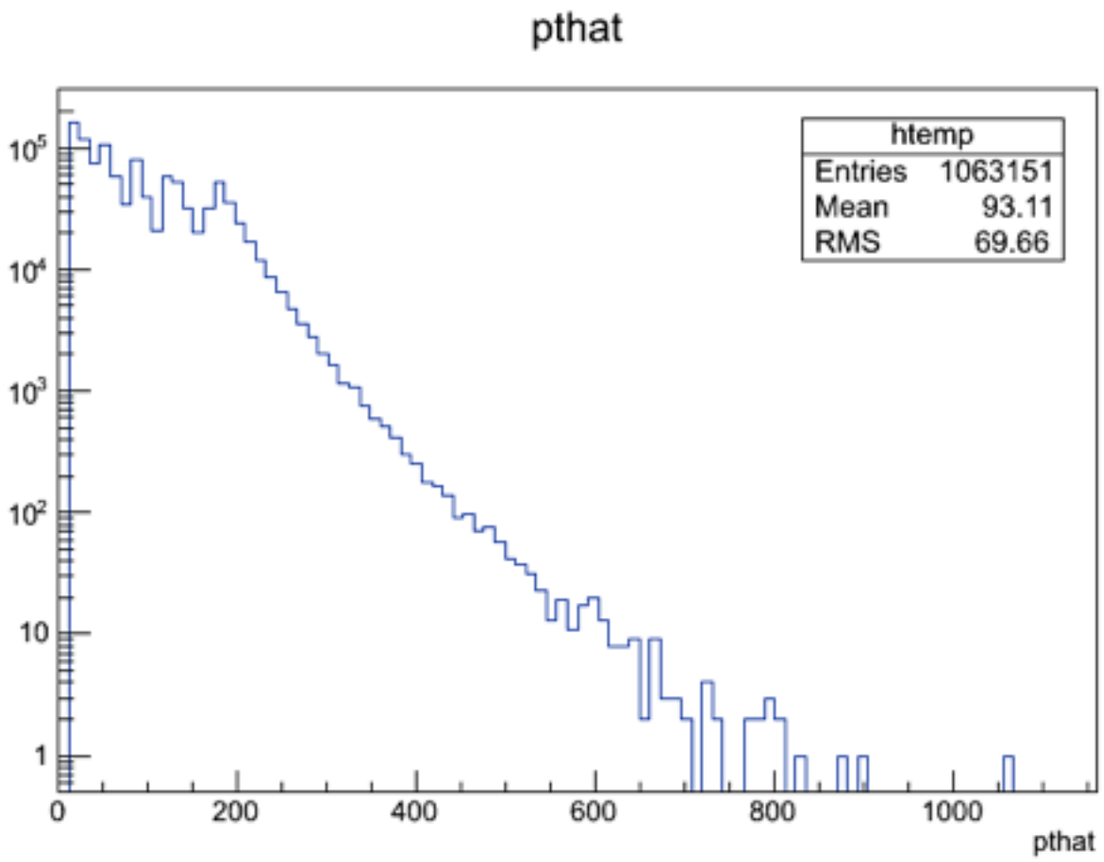
JEC study overview

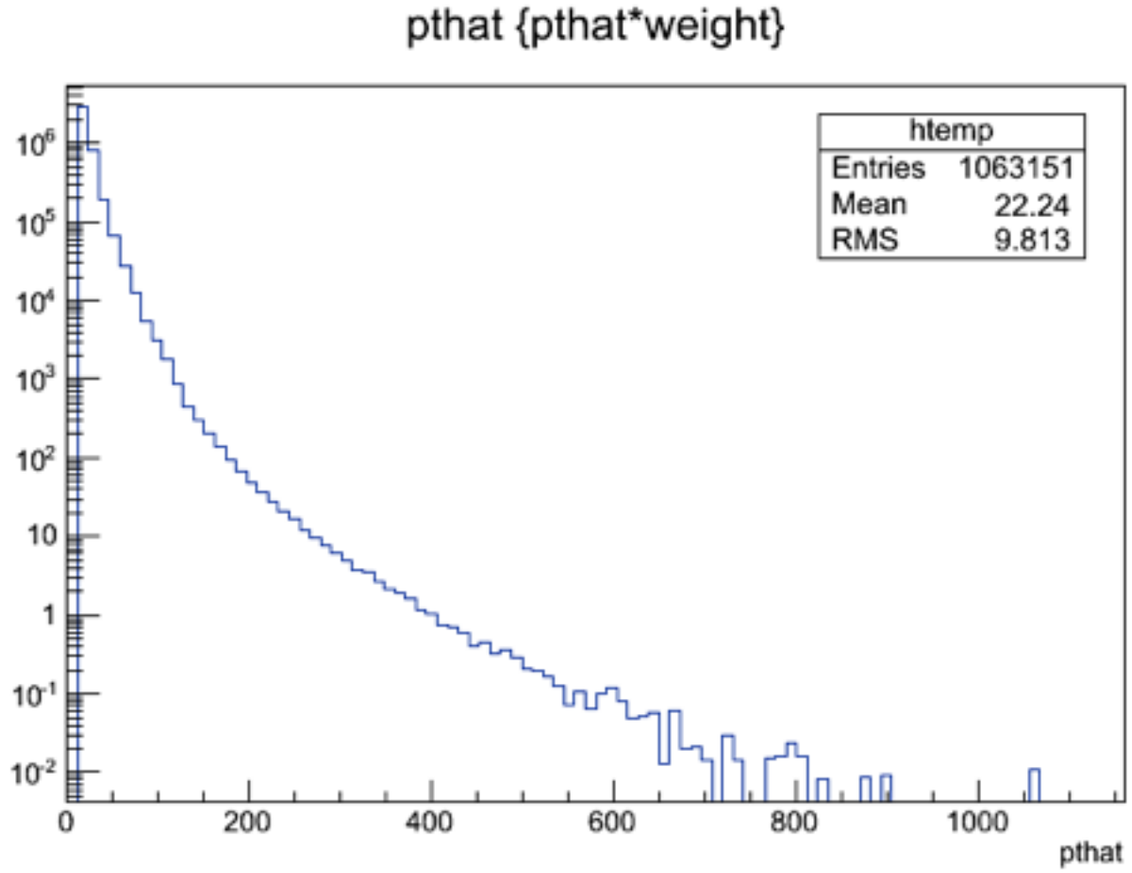
- Used files : HiWinter13 MC (pythia AllQCD) in pPb 2013 conditions
  : 30, 50, 80, 120, 170 pthat samples
  https://twiki.cern.ch/twiki/bin/viewauth/CMS/PhotonAnalyses2014#HiWinter13_MC_pythia_AllQCD_EmEn

- away-side jets associated with leading photon are filtered
  leading photon condition : (hadronicOverEm>=0.1) && (pt>30GeV)
  away-side jet condition : (jet eta<3) && (delta phi>pi/2)

- Environment : CMSSW_5_3_20

applying weighting factor (pPb)

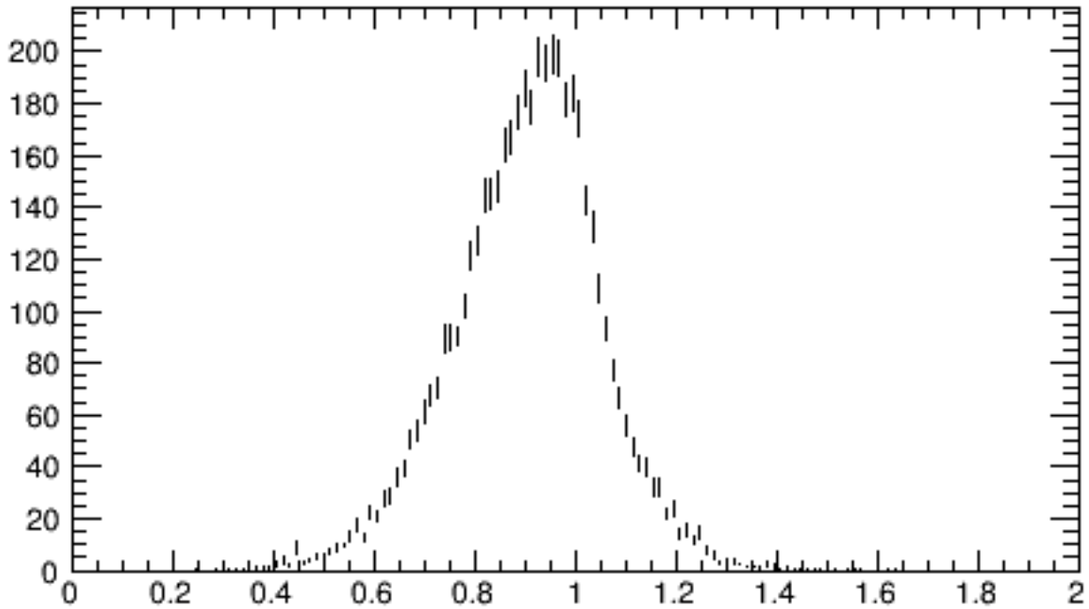




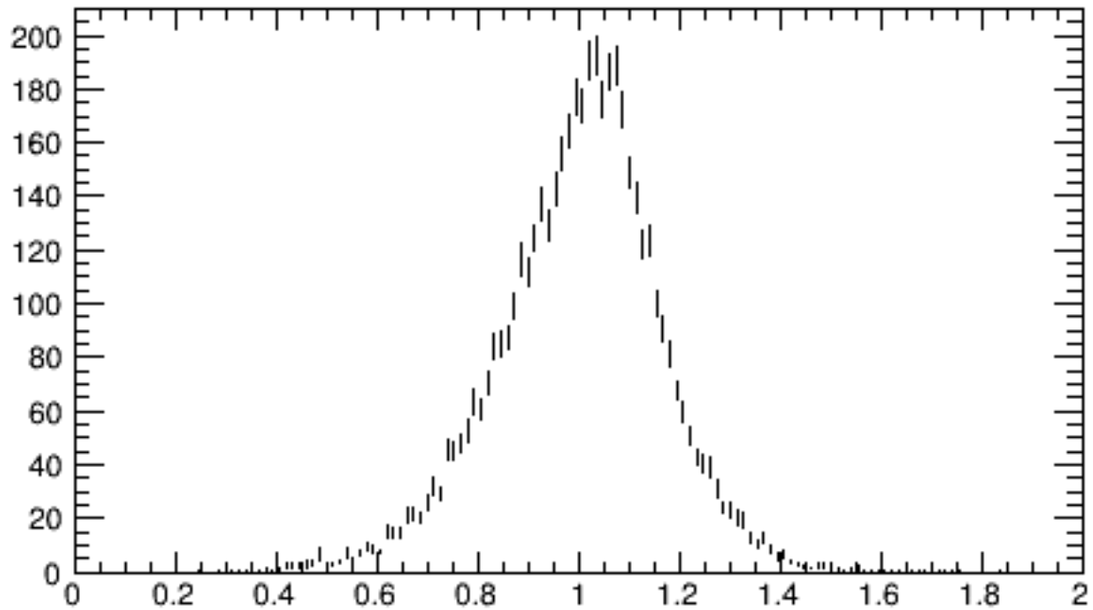
30, 50, 80, 120, 170 pthat samples are combined with appropriate weights

applying JEC

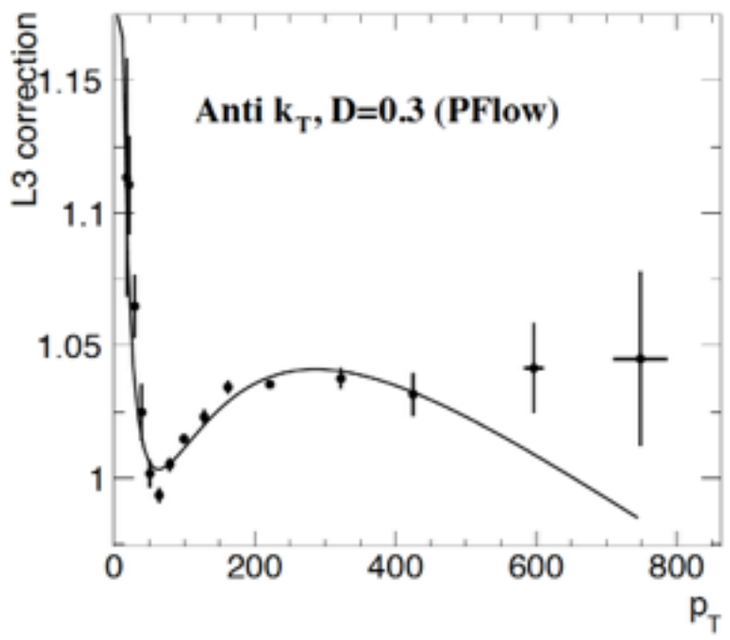
without JEC



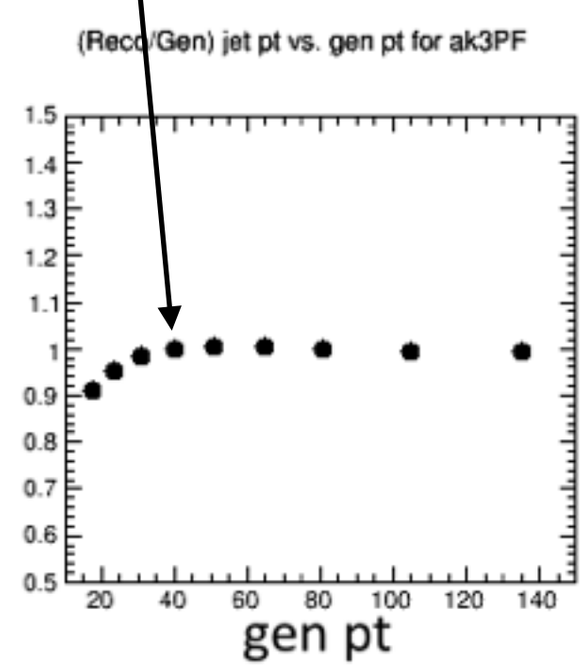
with JEC



applying JEC



Get mean & RMS for each histo.

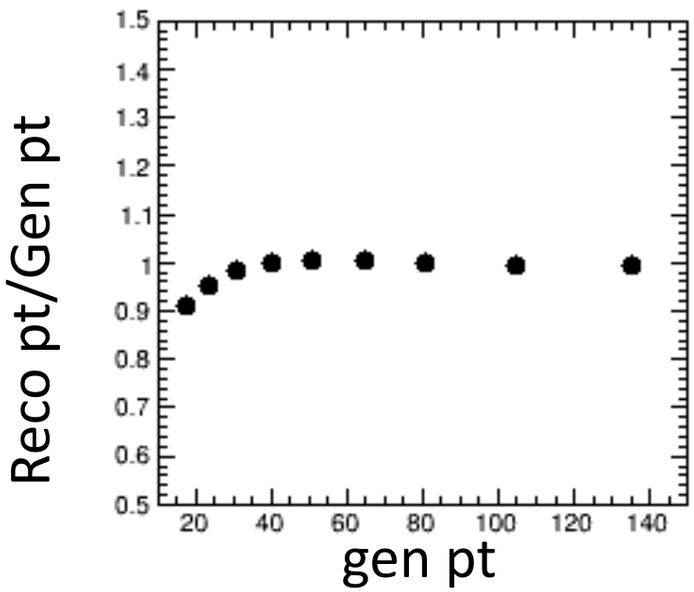


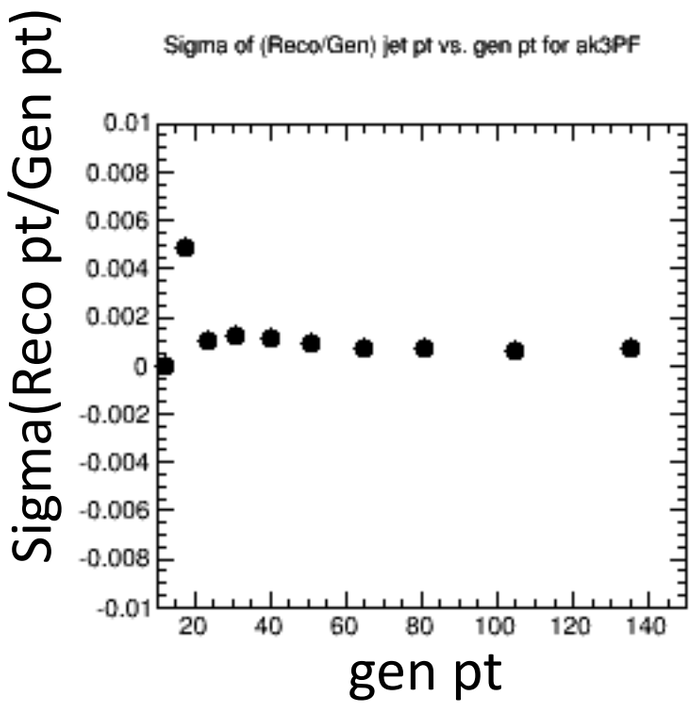
Reco/Gen vs. gen pt (pPb)

with new correction factor

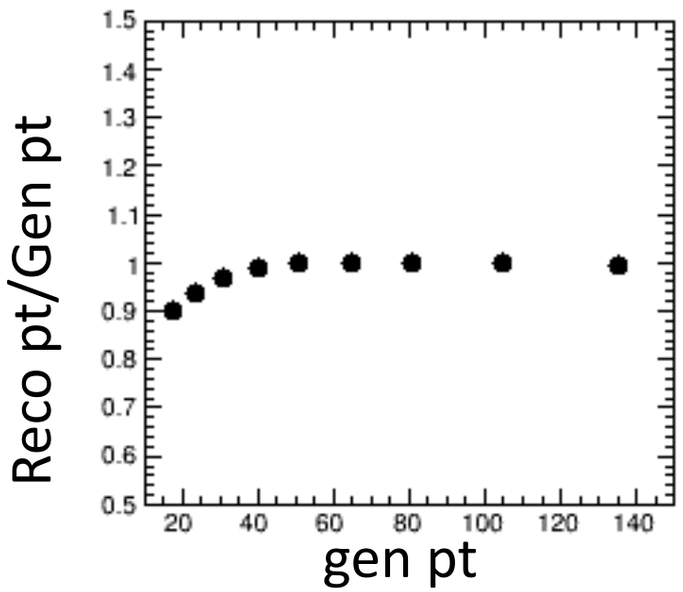
ak(3-5)PF

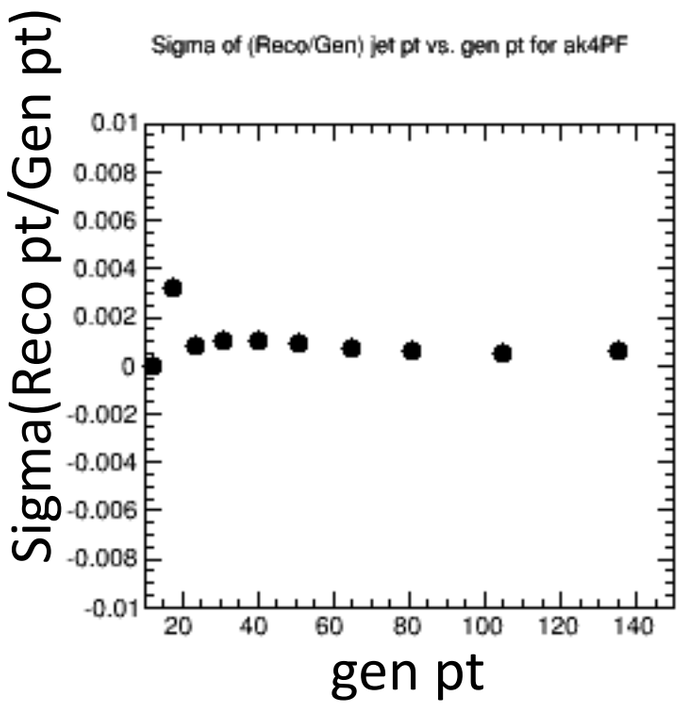
ak3PF



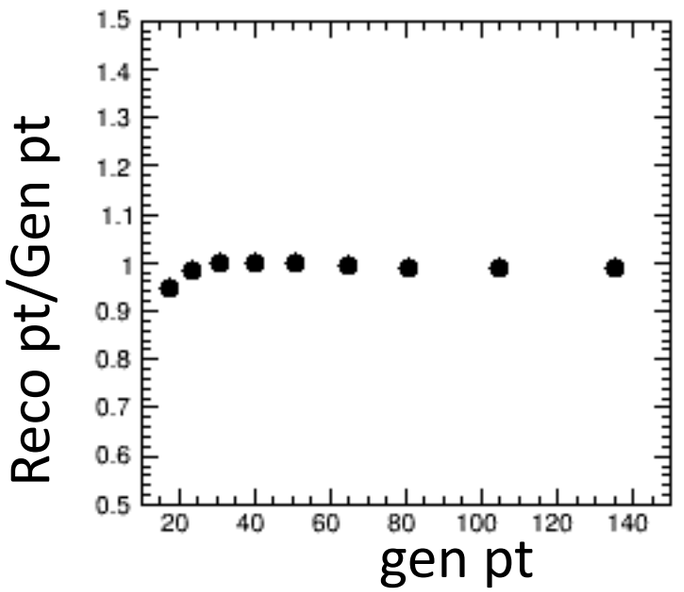


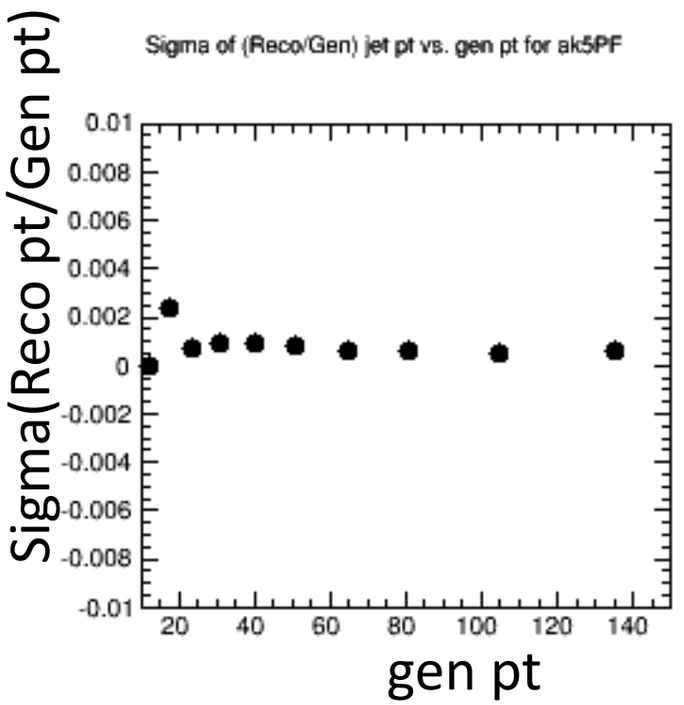
ak4PF





ak5PF





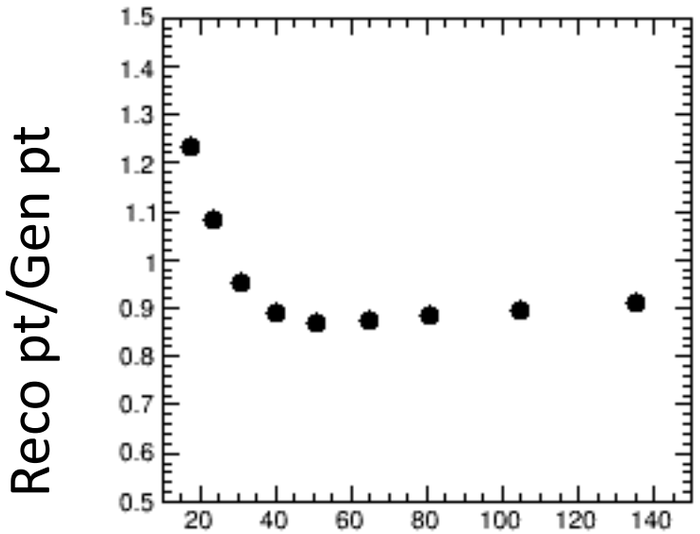
At low pt, it seems that low statistics from threshold makes bad JEC

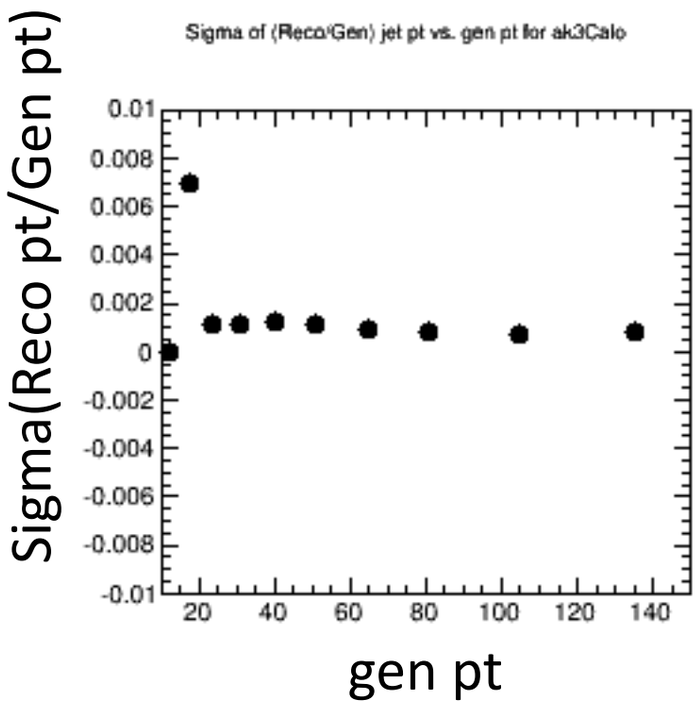
Reco/Gen vs. gen pt (pPb)

with new correction factor

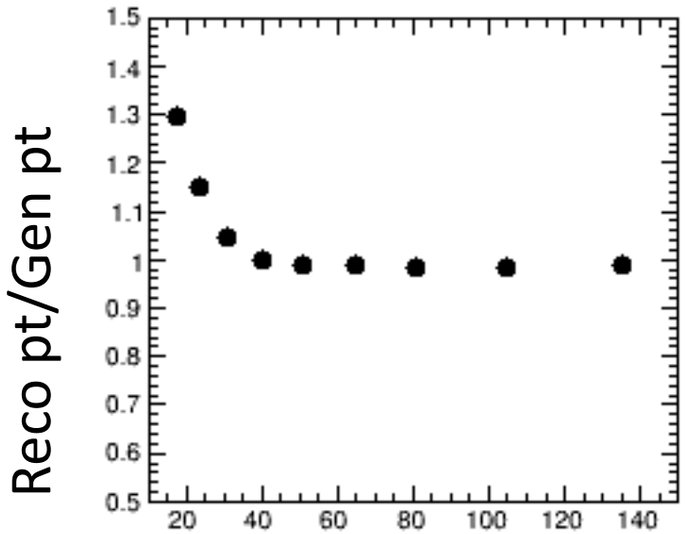
ak(3-5)Calo

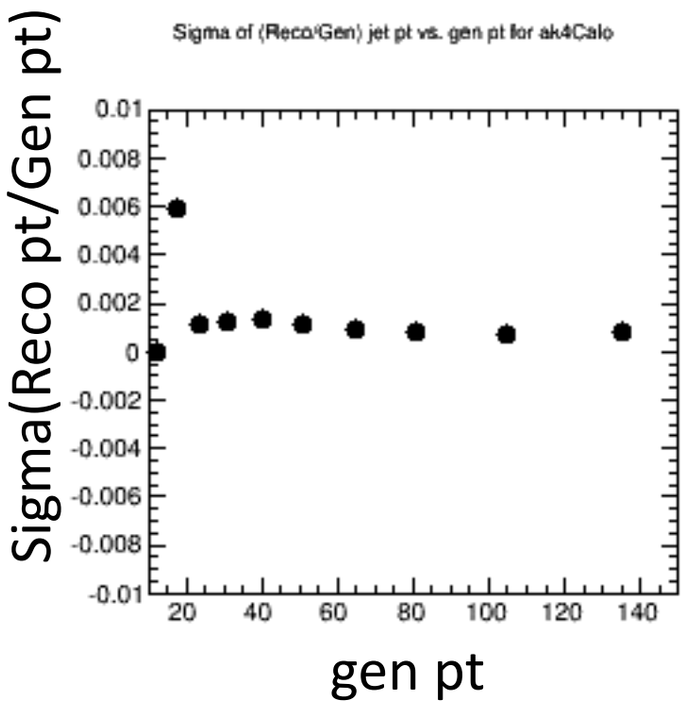
ak3Calo



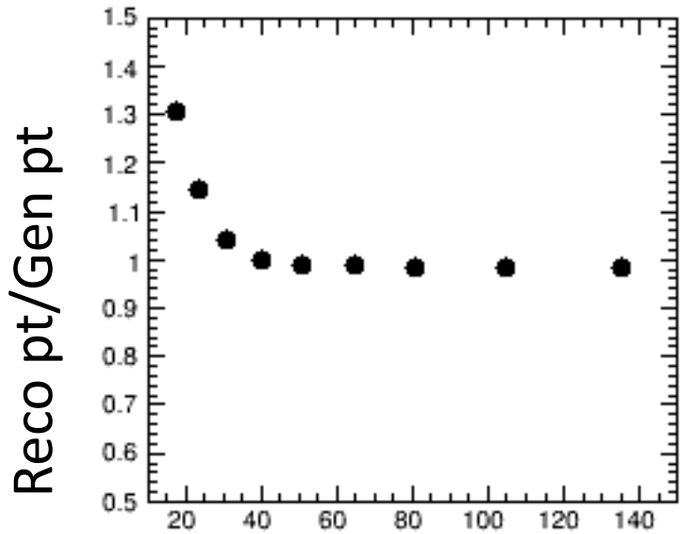


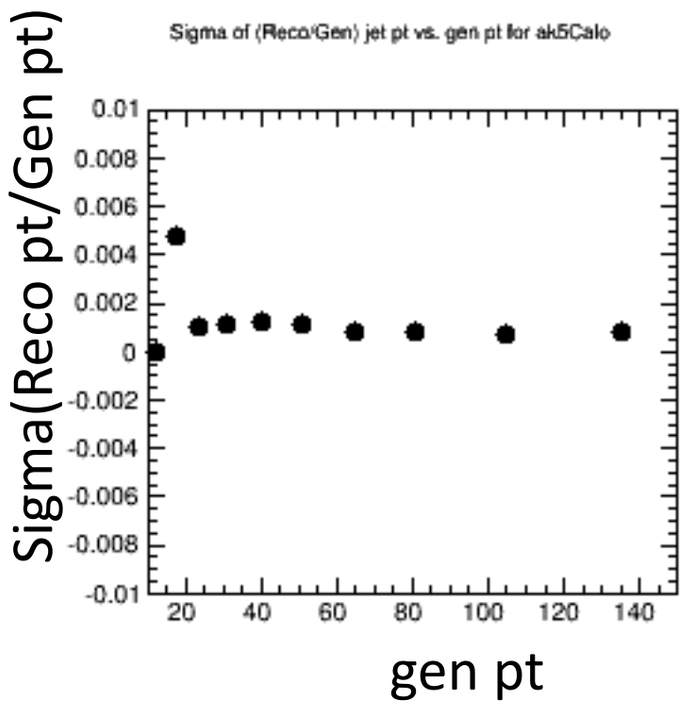
ak4Calo





ak5Calo



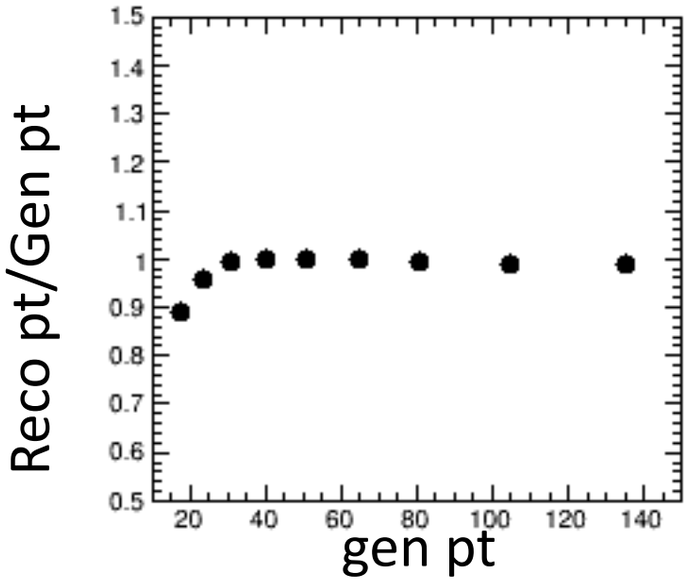


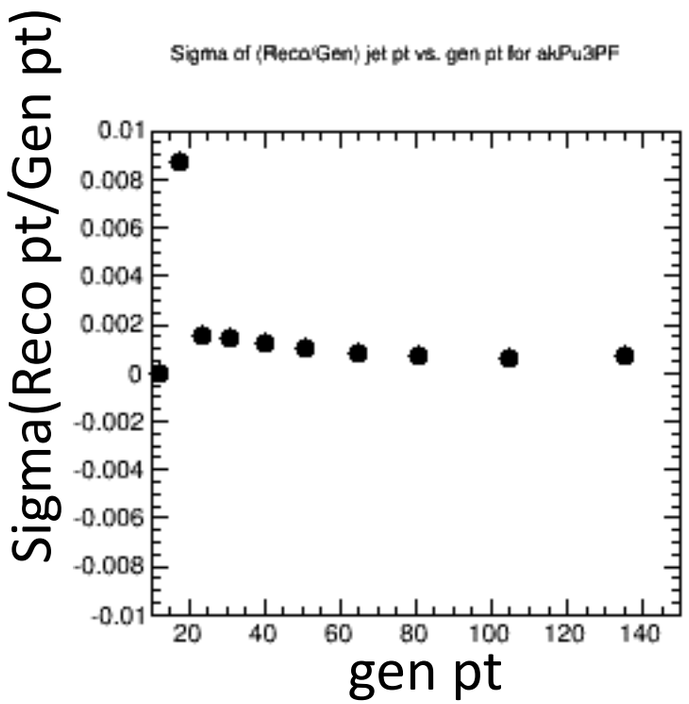
Reco/Gen vs. gen pt (pPb)

with new correction factor

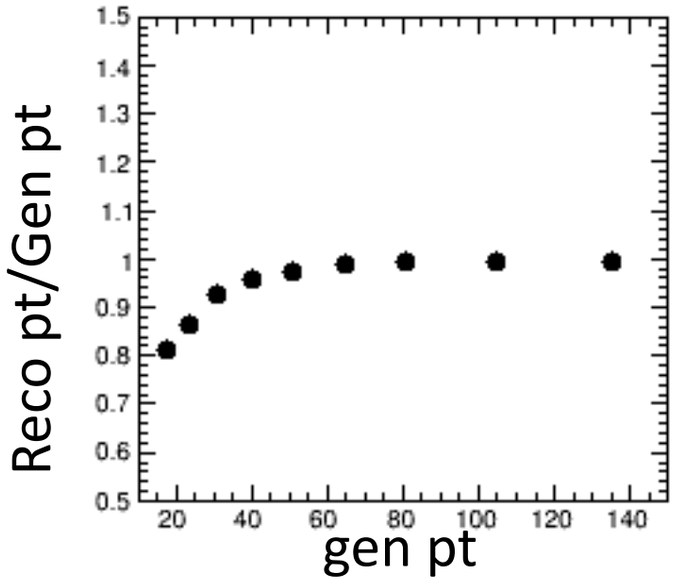
ak(3-5)PuPF

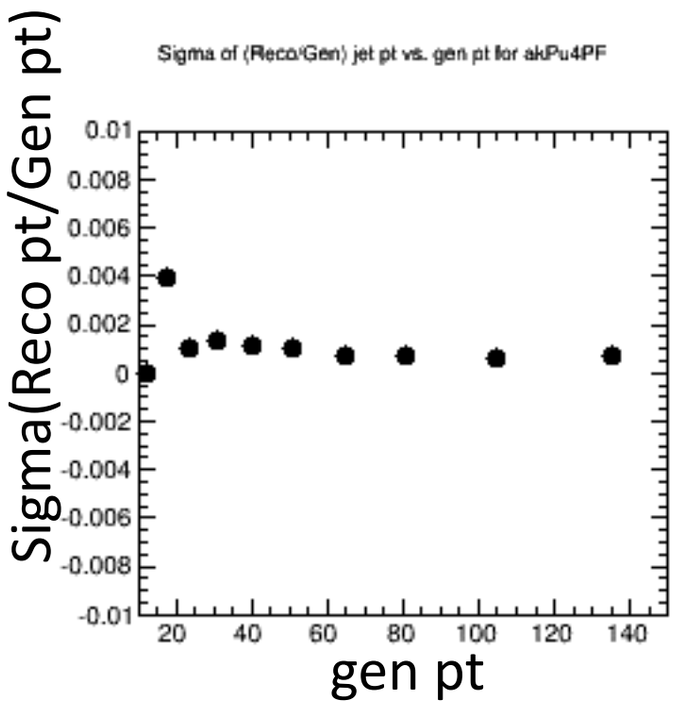
ak3PuPF



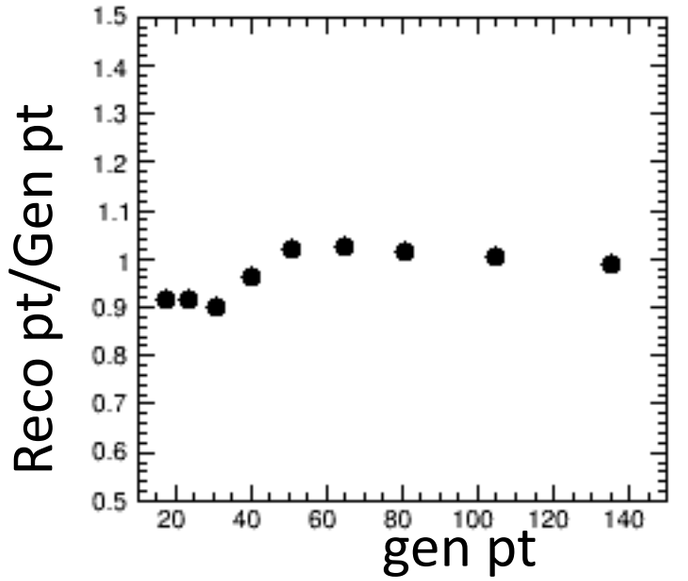


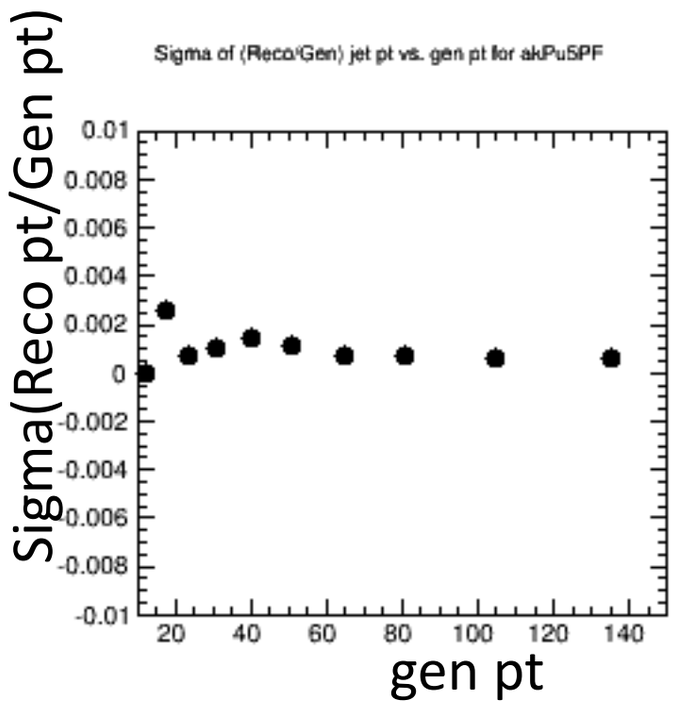
ak4PuPF





ak5PuPF



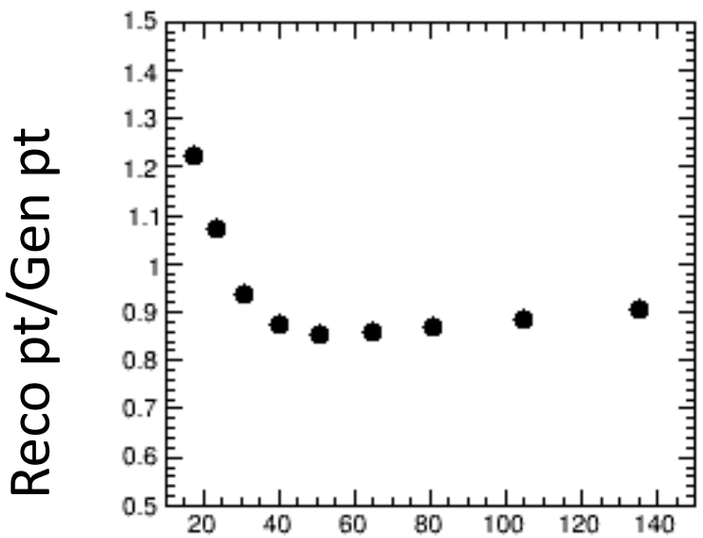


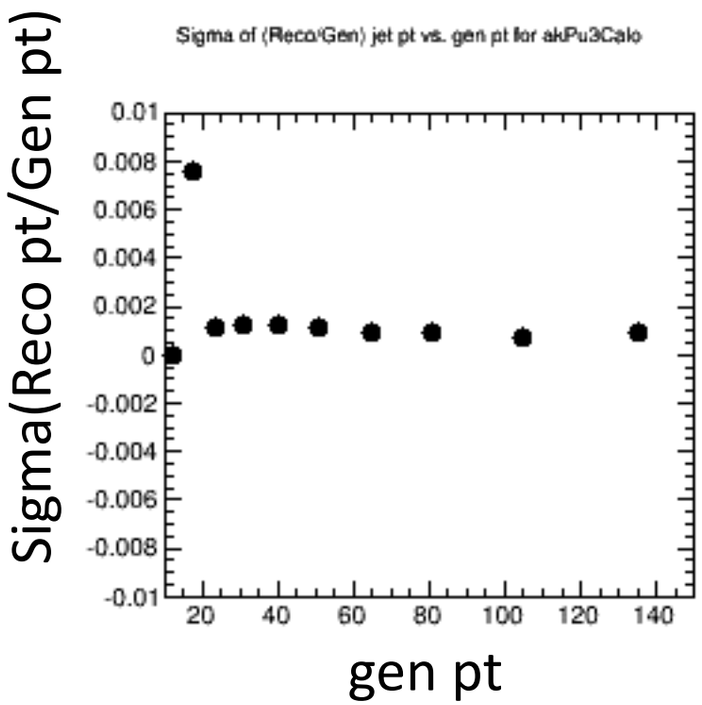
Reco/Gen vs. gen pt (pPb)

with new correction factor

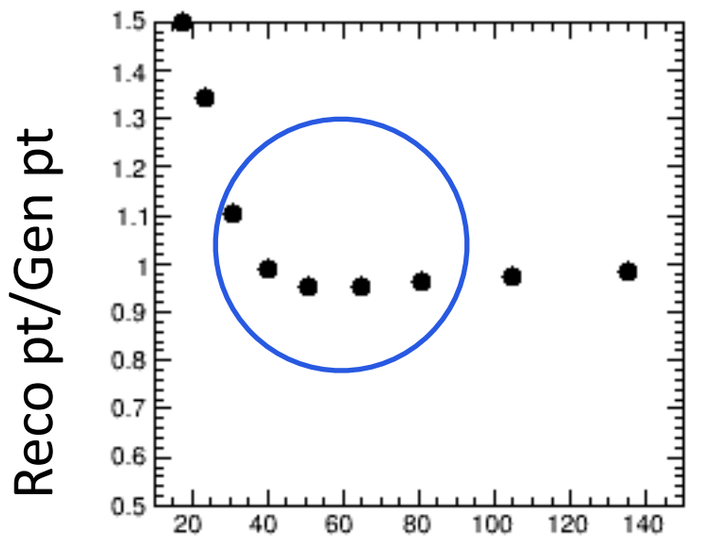
ak(3-5)PuCalo

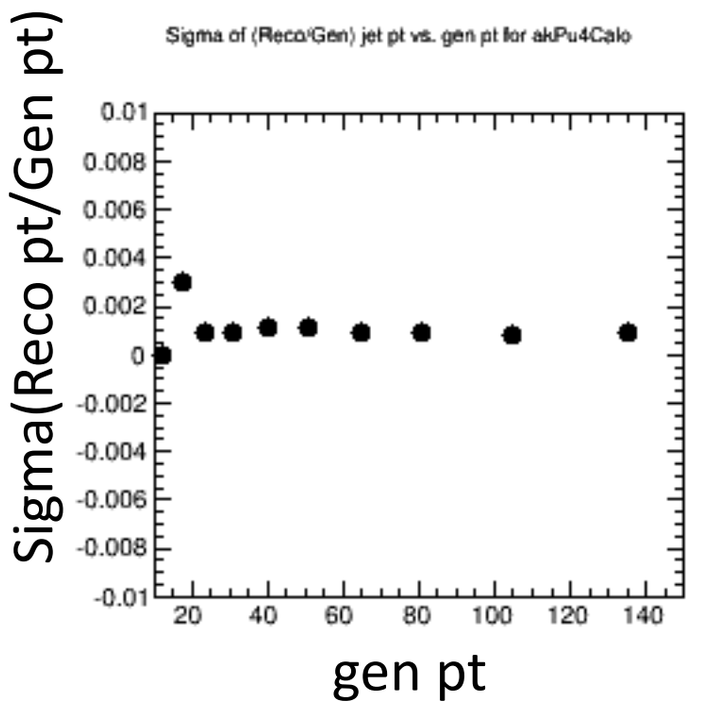
ak3PuCalo



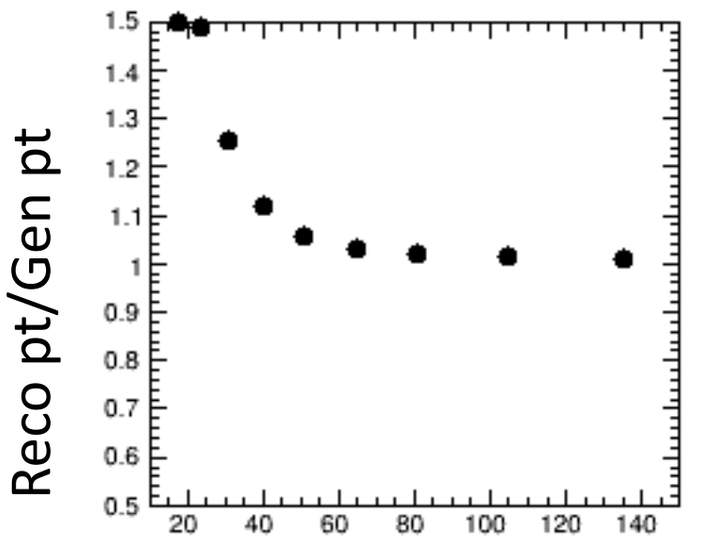


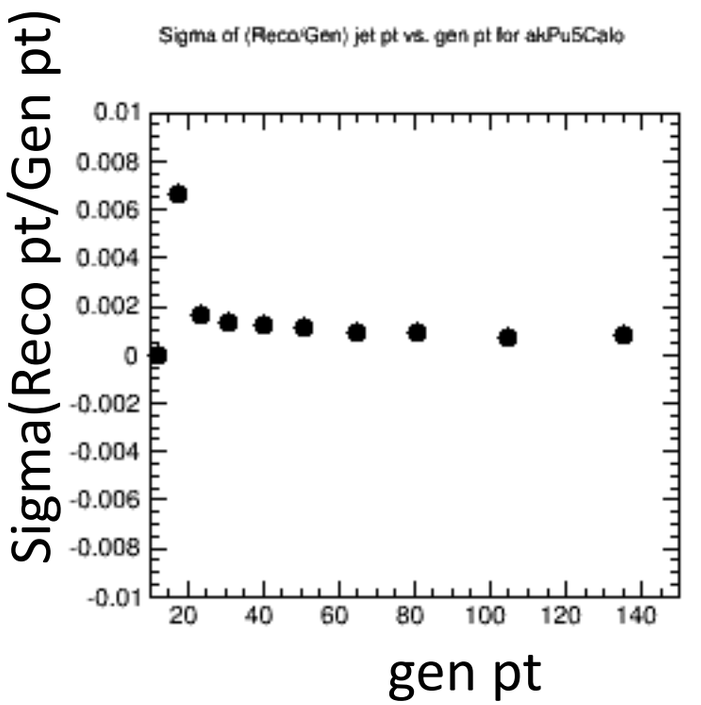
ak4PuCalo





ak5PuCalo





although excepting for low pt, bad JEC around 40-100 GeV <- maybe bad fitting

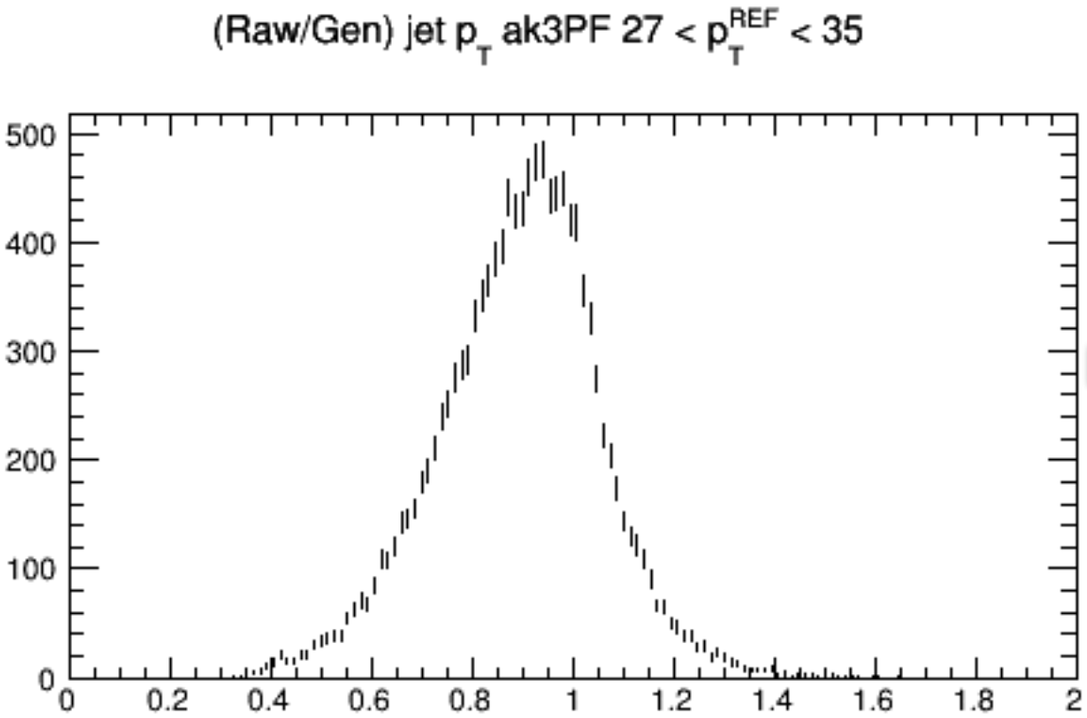
JEC Plan

- look into the fitting procedure for the each correction fragments.(I2, I3, I5)
- eta, phi dependence JEC of pPb will be updated soon.
- after making new PbPb MC, PbPb JEC also will be updated.

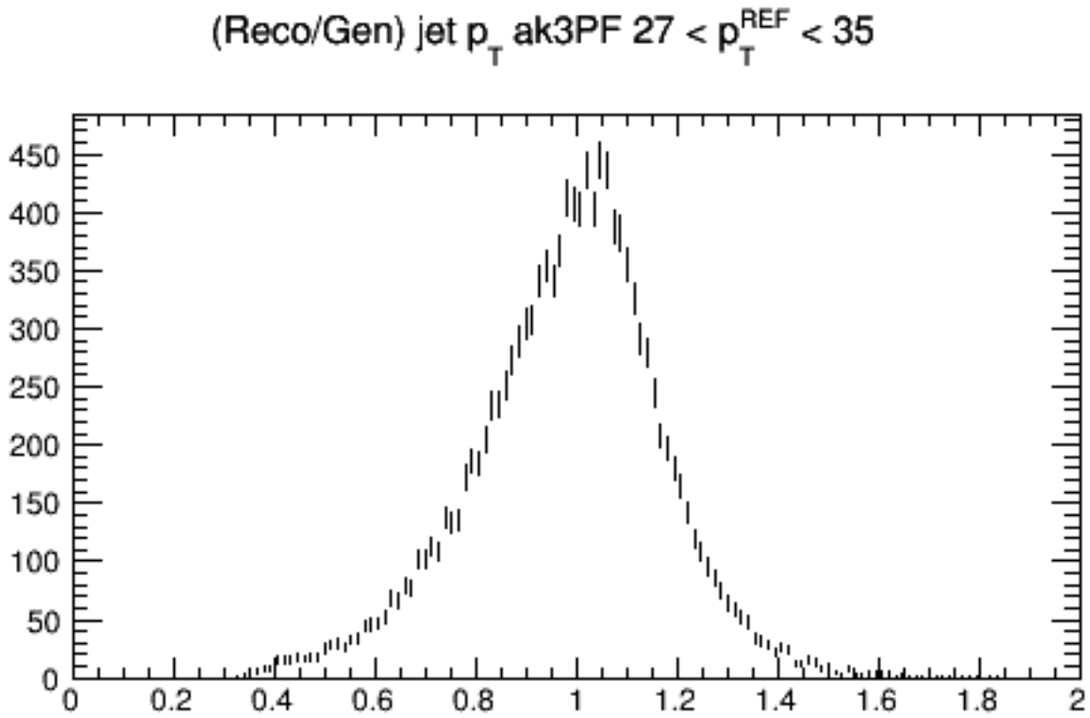
BACK UP

example for one pt bin

before JEC



after JEC



applying weighting factor (pp)