JEC & Centrality

14. Nov. 2014

Yeonju Go

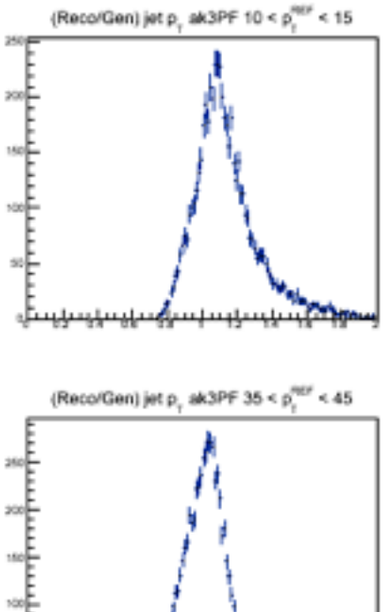
JEC

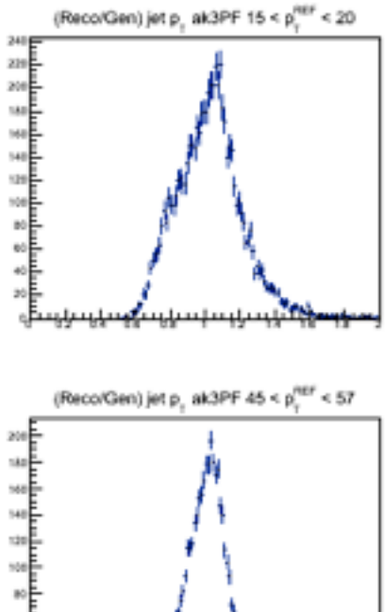
Contents

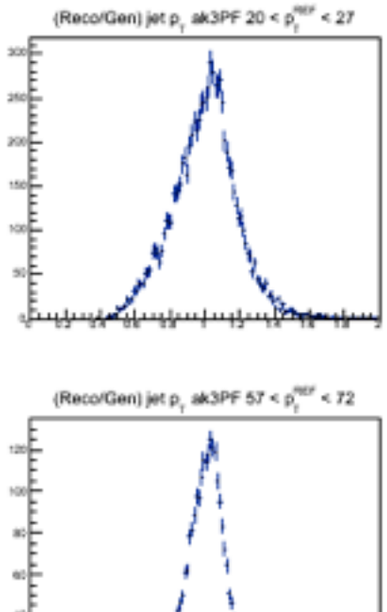
- **I got JEC for the pPb photon-jet PYTHIA and Alex is applying it to the sample.**

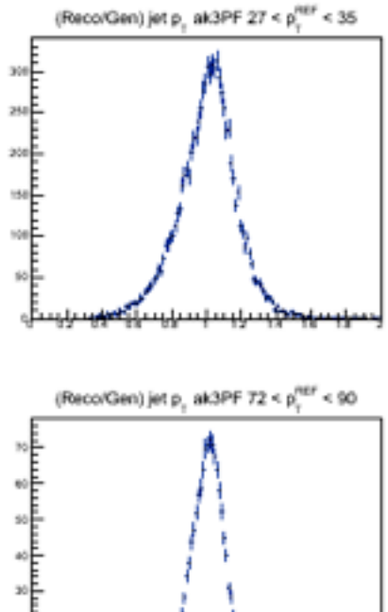
- **Used sample : AllQCDPhoton 15, 30, 50, 80, 120 pthat merged sample (for photon-jet study)**
  - Isolated leading photon conditions.
    - photon > 30 GeV , h/e ratio <0.1, genMached==1, |momId|<=22
  - away-side jet condition.
    - delta phi > pi/2

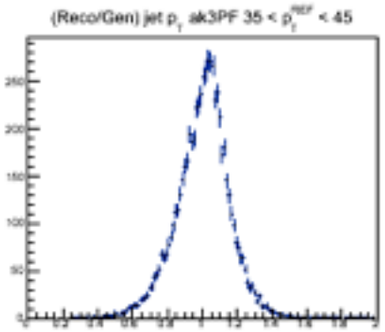
(ak3PF) reco/gen full dist.

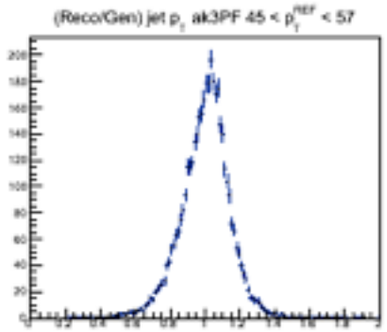


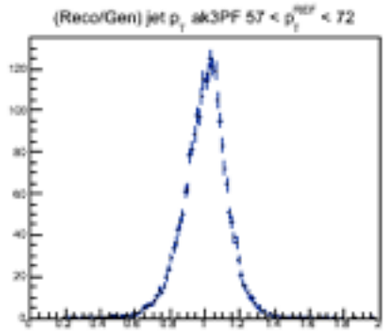


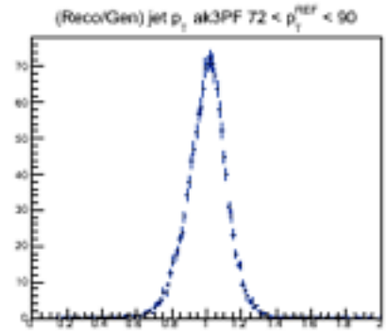


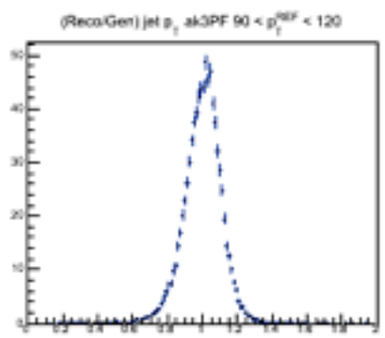


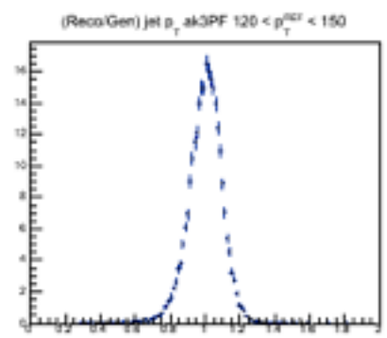


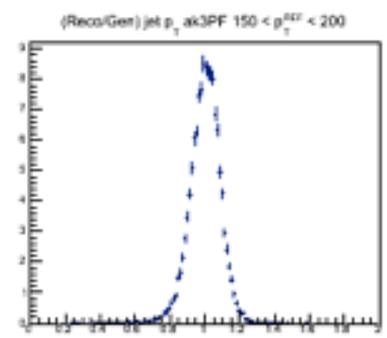


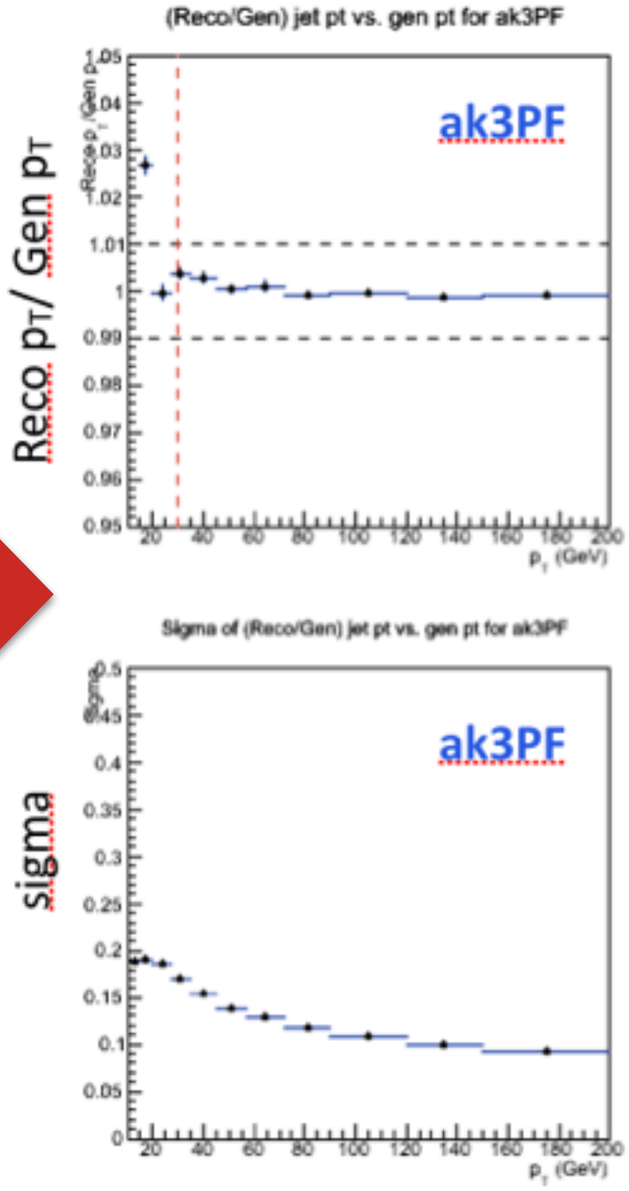






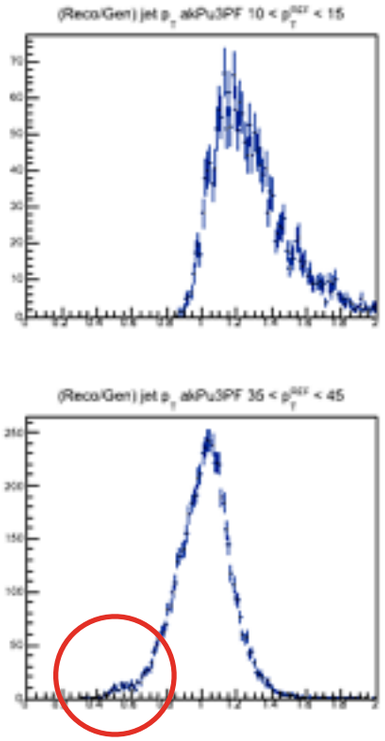


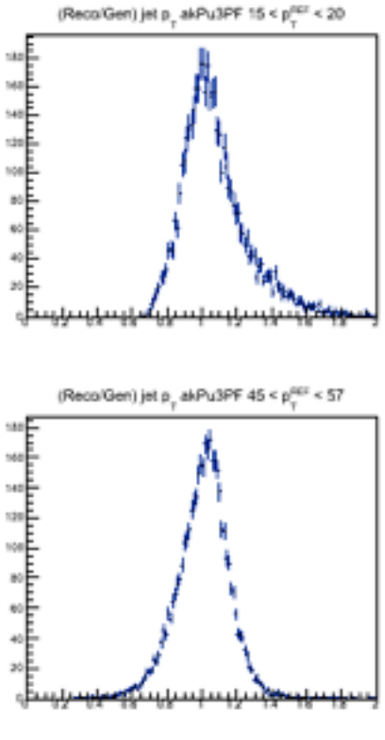


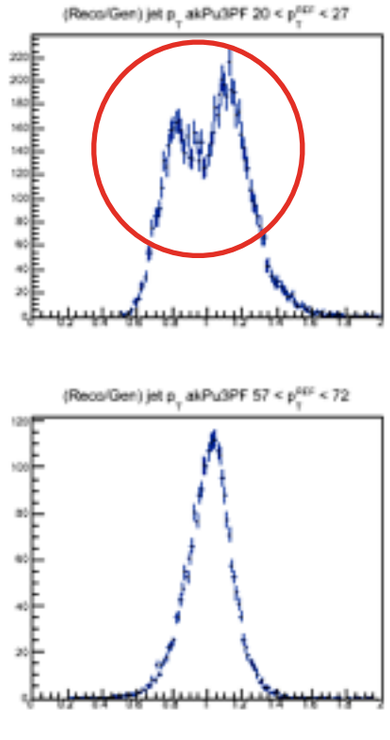


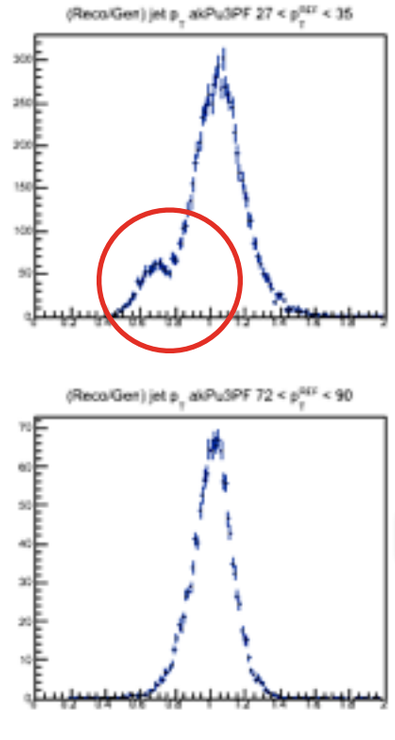
- **(Reco/Gen) full distribution for each gen p_T bins.**
- **Almost gen pt bins have Reco/Gen = 1. (good JEC)**

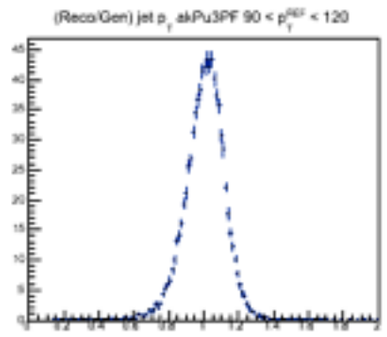
(akPu3PF) reco/gen full dist.

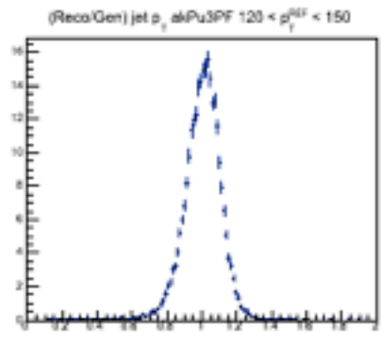


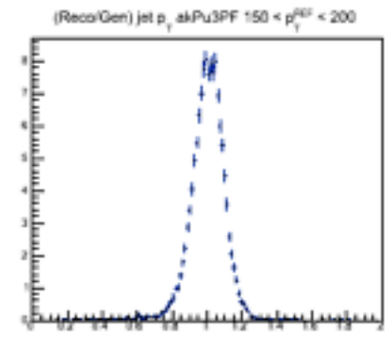


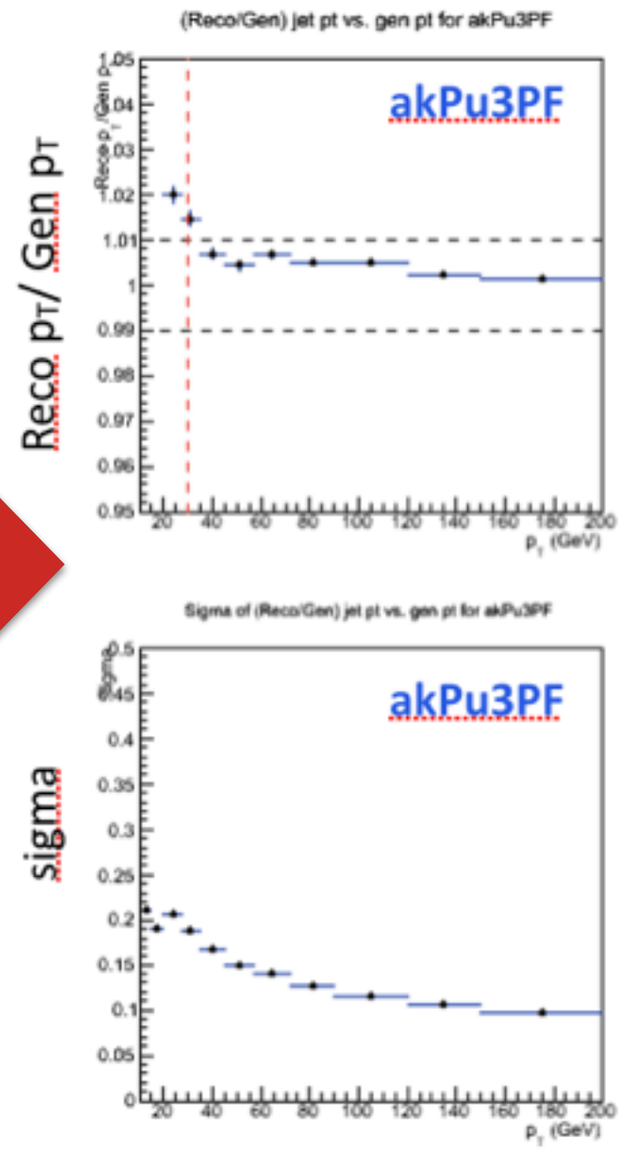








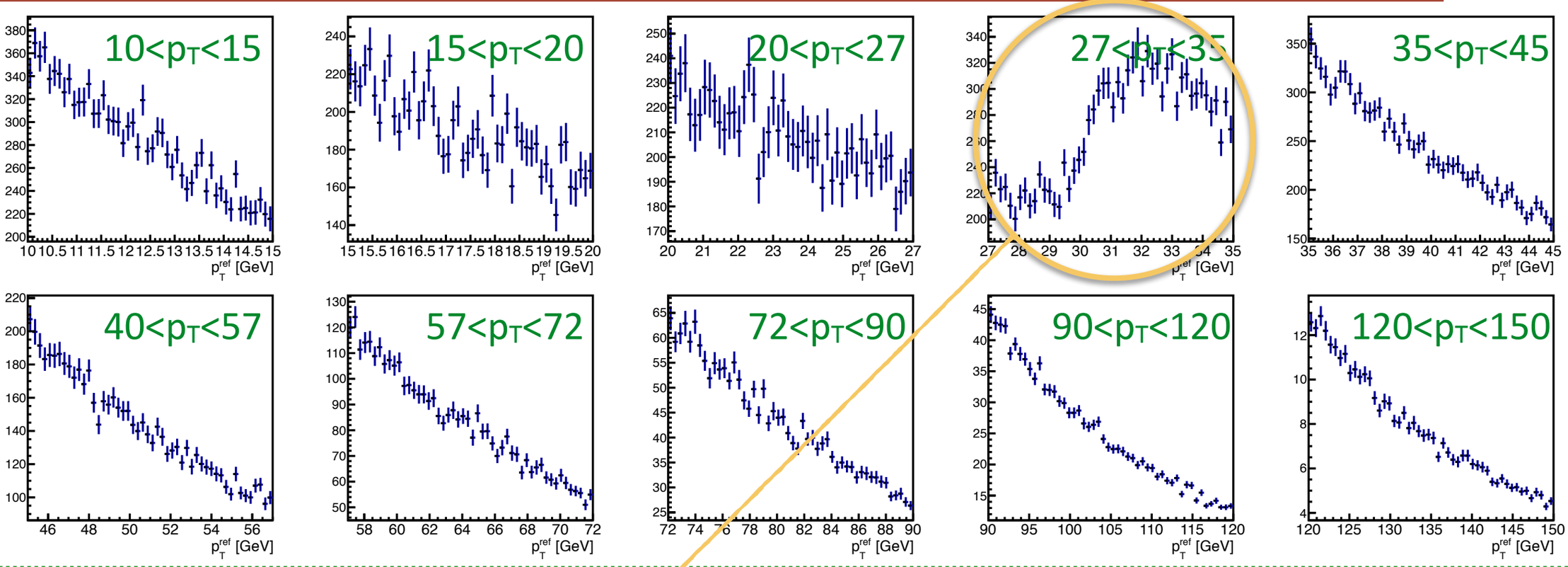




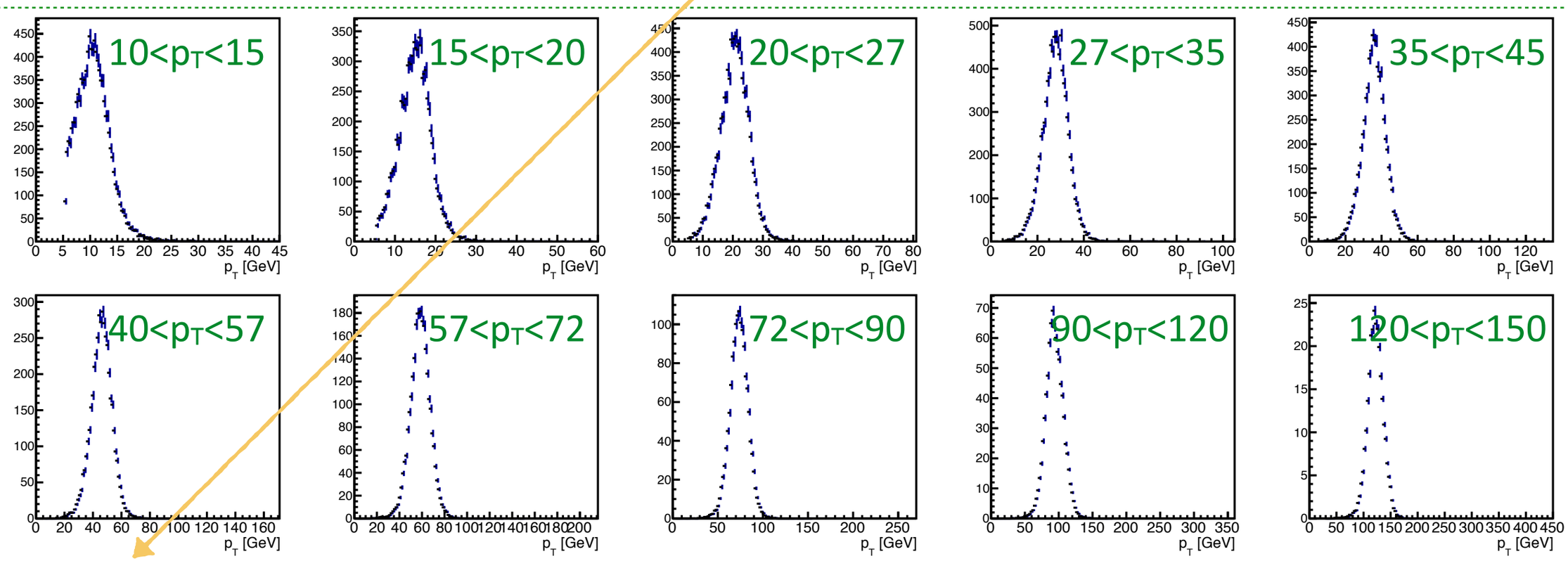
- **Two peak structure in 3,4,5th gen p_T bins.-> It makes bad JEC**
- **To figure out the origin, draw Gen p_T & Raw p_T spectrum separately**

(ak3PF) Gen & Raw pt distribution

Gen Pt



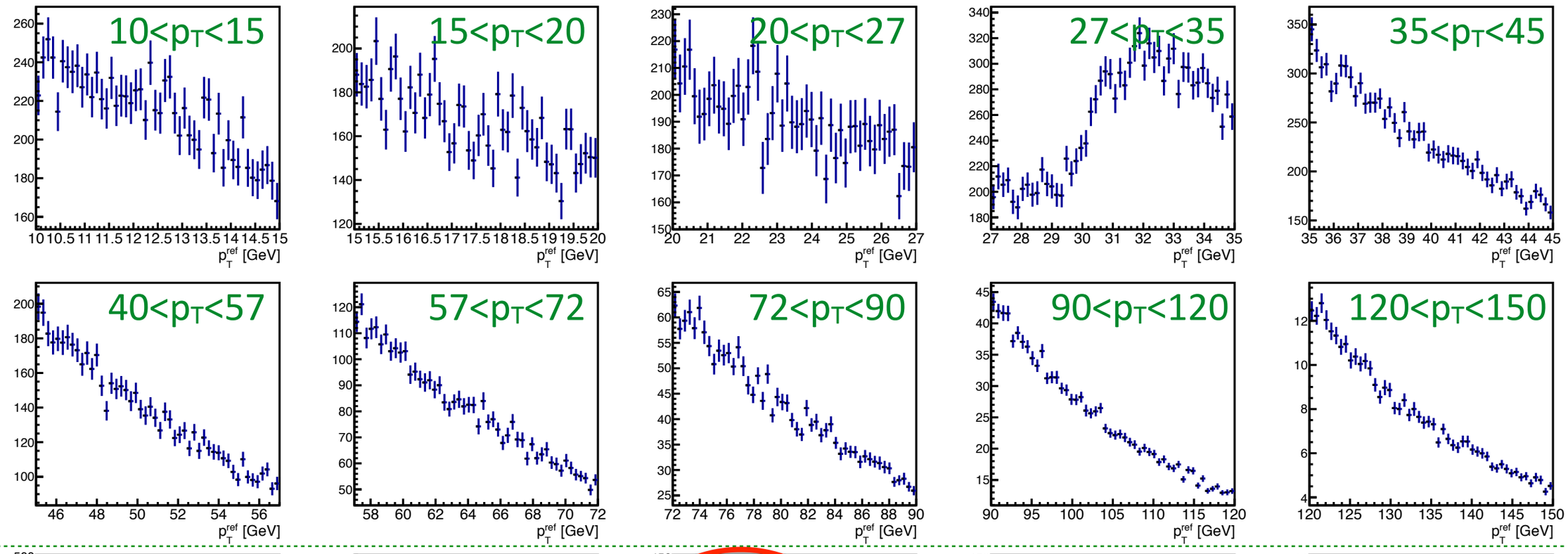
Raw Pt



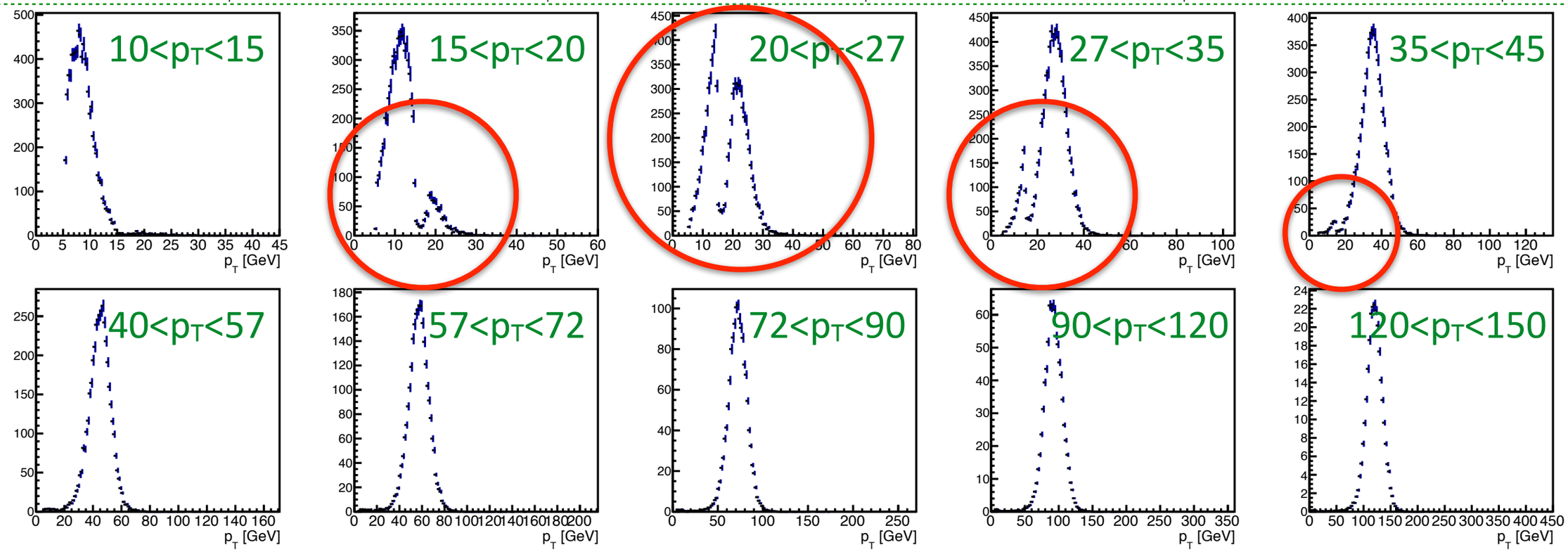
- **Because of the photon cut**
- **weight factors are applied.**
- **non-PU case is fine.**

(akPu3PF) Gen & Raw pt distribution

Gen Pt

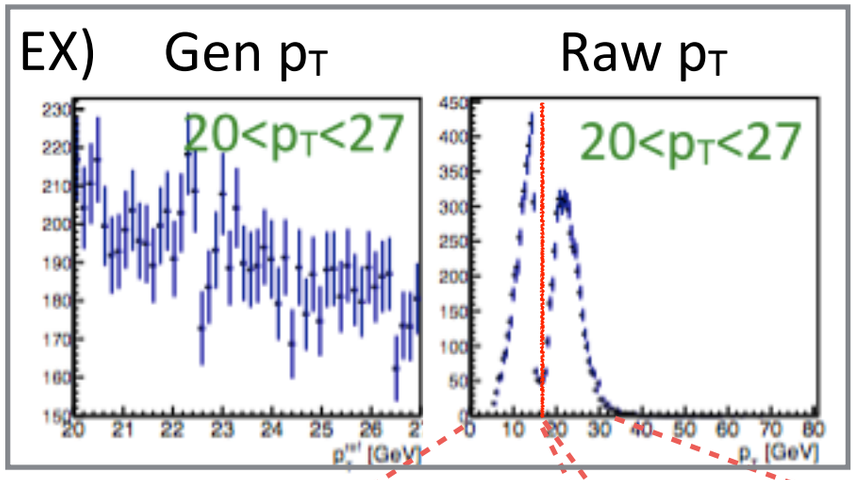


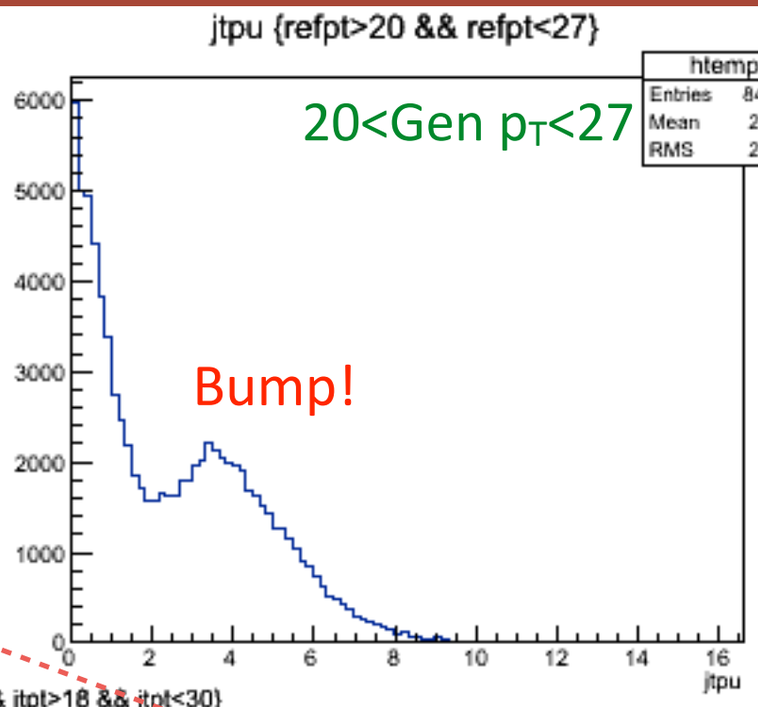
Raw Pt

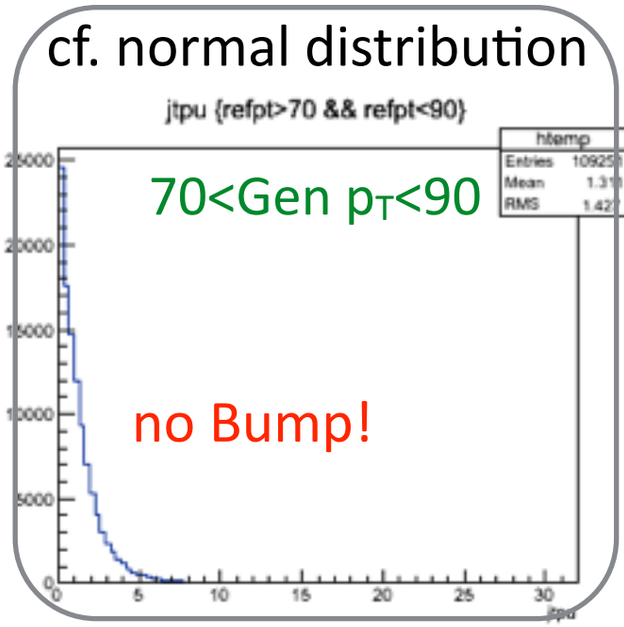


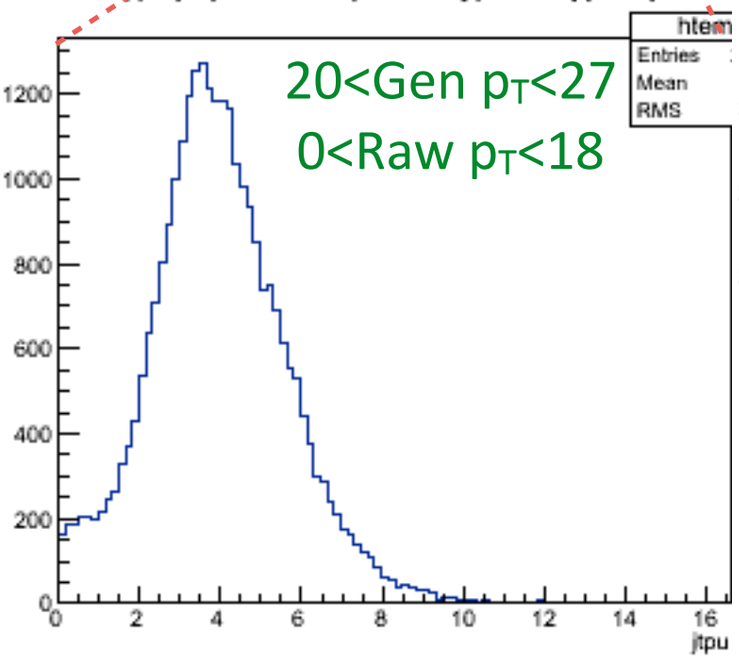
- **Raw p_T has two peak structure. -> To figure out the origin, check the jet variables.(slide #7)**

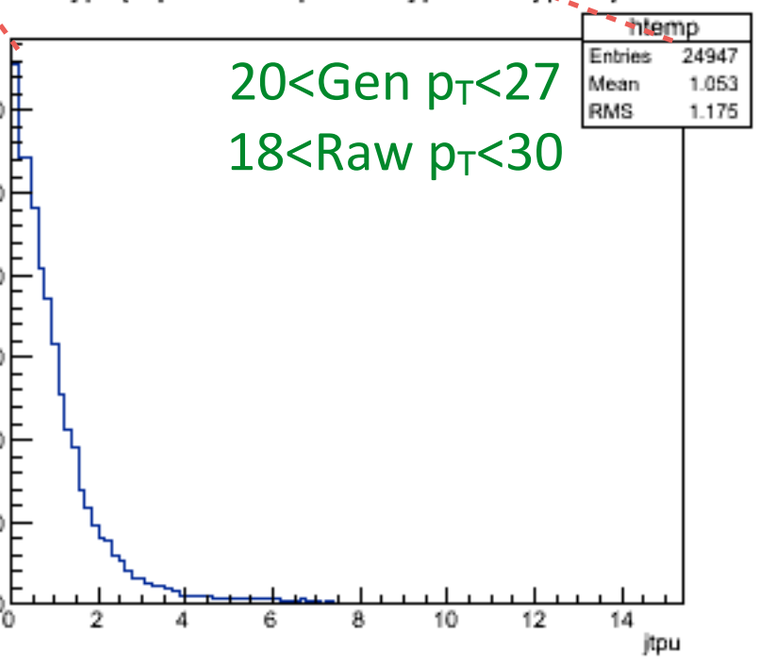
(akPu3PF) jtpu











- **Abnormally assigned jtpu is the origin of two peak structure of raw pt.**
- **It is CMSSW technical problem -> takes too much time to fix this.**
- **Photon Analyzers decided to use a residual correction to the akPu3PF algorithm.**

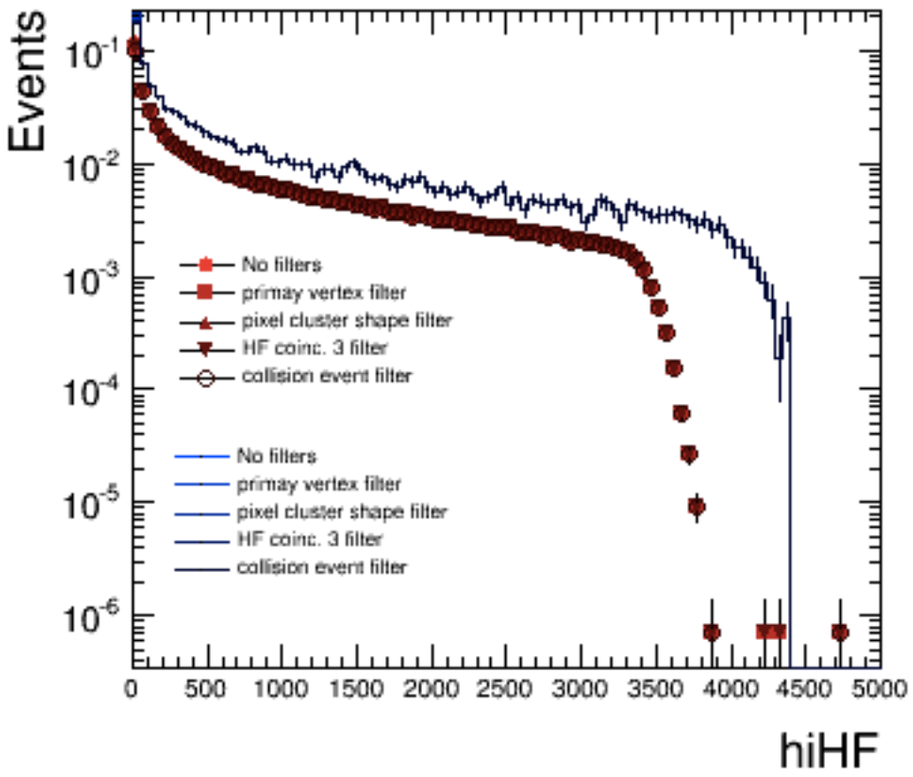
Centrality

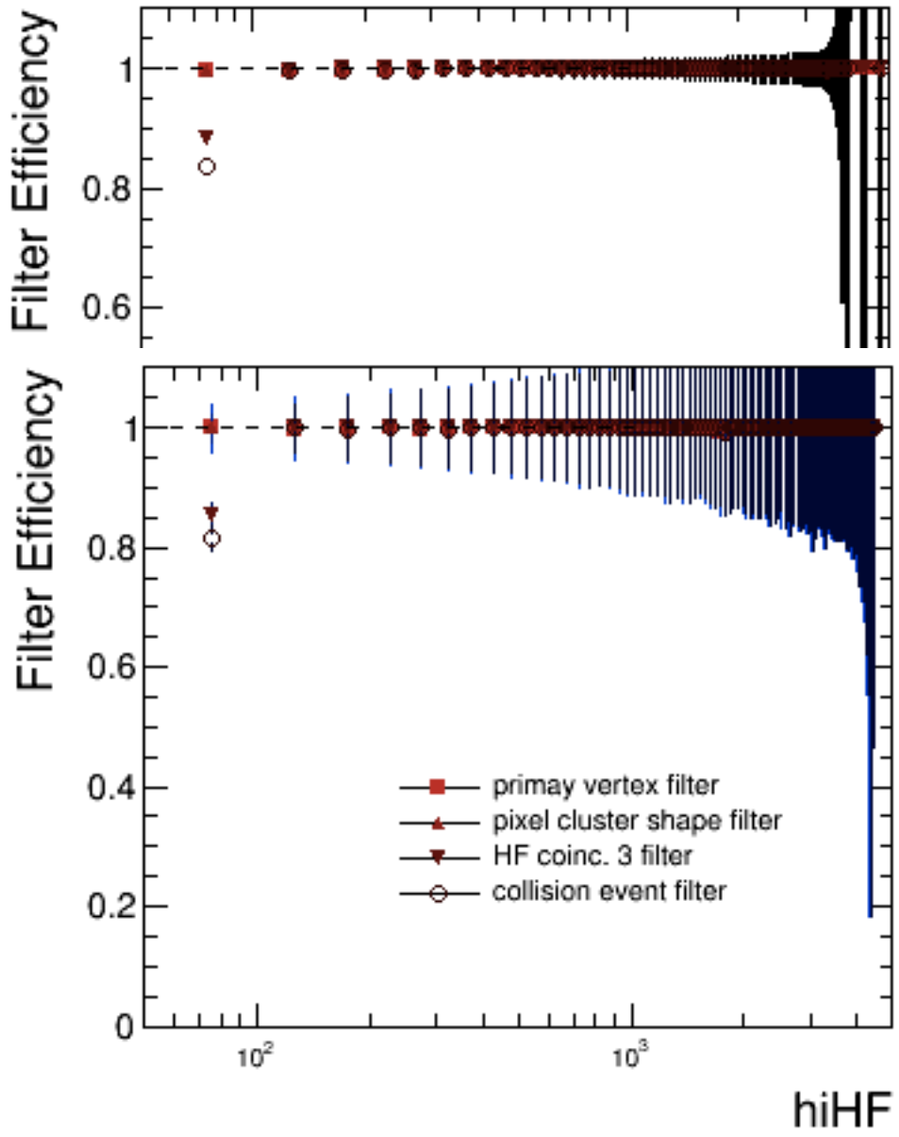
Contents

- **I made MC forest privately and MC is being produced officially.**
- **I'm studying <u>event selection efficiency</u> and <u>minimum bias trigger efficiency</u> for the PbPb rereco.**

- **Used Sample**
  - **DATA** Forest : /u/user/kilee/CMSSW_5_3_20/src/20141011/HiForest_20141011.root (In KNU server, produced by Kisoo Lee)
    (RECO DAS : /HIMinBiasUPC/HIRun2011-14Mar2014-v2/RECO)
  - **MC** Forest : /u/user/goyeonju/PRODUCTION/CMSSW_5_3_20/src/centralityMC/merging_forest/centrality_PbPb_minbias_MC.root
    (GENSIM DAS : /Hydjet1p8_TuneDrum_Quenched_MinBias_2760GeV/HiFall13-STARTHI53_V28-v2/GEN-SIM)

HF energy dist.





- **Normalized by number of events.**
- **In MC, weighting by ratio of data/mc in HF dist. might be needed.**
- **Efficiencies by data and MC is similar.**
- **HF tower distributions and other objects are going to be studied.**

BACK UP

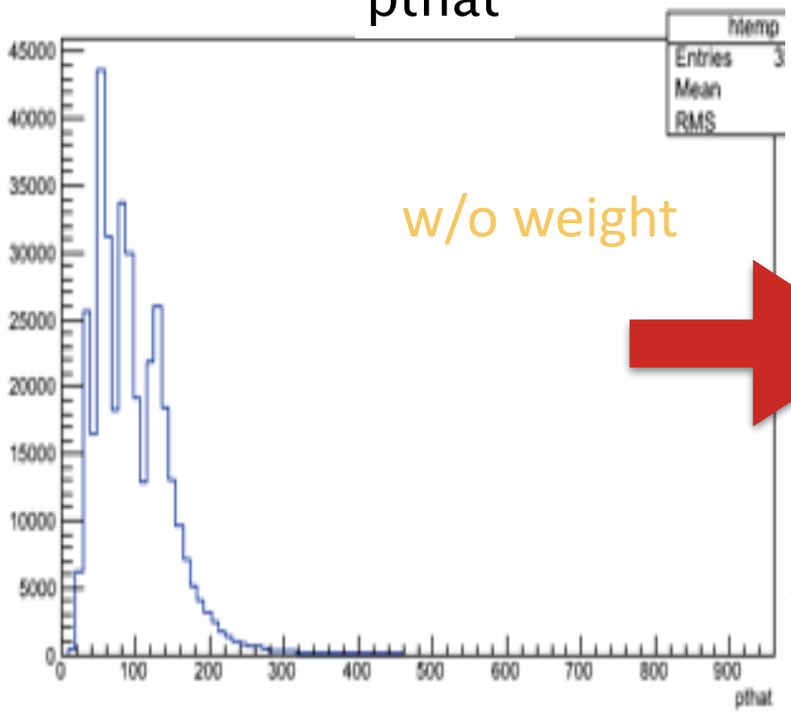
Before JEC

AllQCDPhoton 15, 30, 50, 80, 120 pthat merged sample

- leading photon conditions.
  - photon > 30 GeV , h/e ratio <0.1, genMached==1, |momId|<=22
- away-side jet condition.
  - delta phi > pi/2

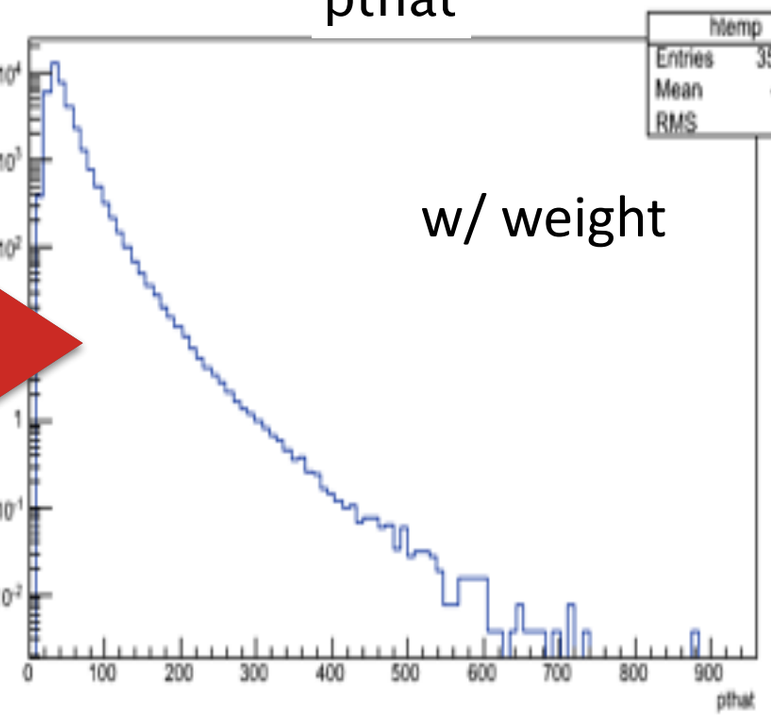
<pt definition in the code>
jtpt = rawpt
corrpt = rawpt corrected by di-jet default JEC

pthat



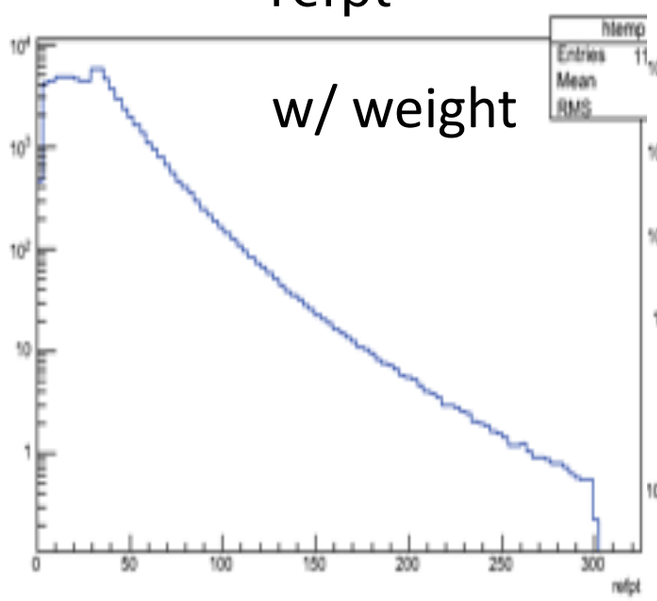
w/o weight

pthat



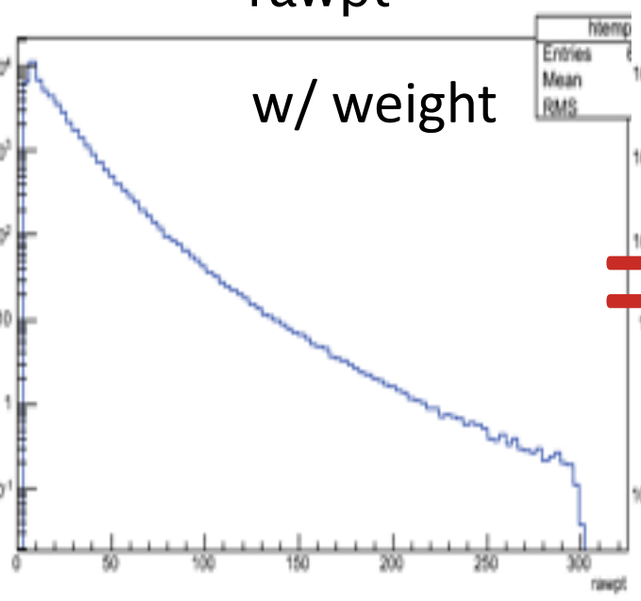
w/ weight

refpt



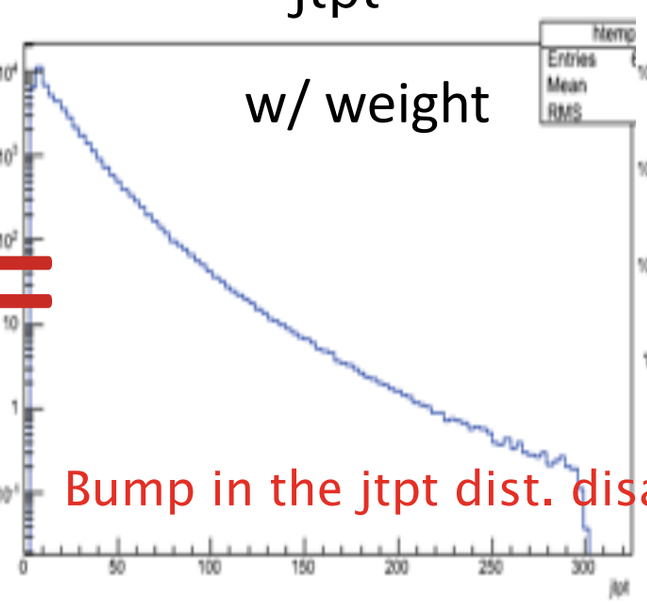
w/ weight

rawpt



w/ weight

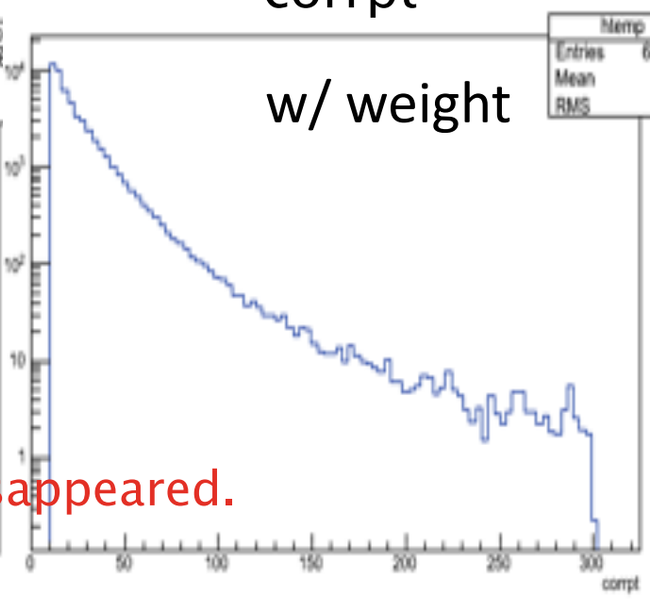
jtpt



w/ weight

Bump in the jtpt dist. disappeared.

corrpt



w/ weight

Filter Explanation

- **Pixel Cluster Shape Filter**
  - Pixel cluster shapes compatible with a primary vertex
  - the pixel template code should give a probability value (i.e. the pixel cluster shape and trajectory angle should be within the template validity range)
  - the pixel cluster shape in the x-direction should be compatible with the template one with a probability > cut configurable
  - the pixel cluster shape in the y-direction should be compatible with the template one with a probability > cut configurable