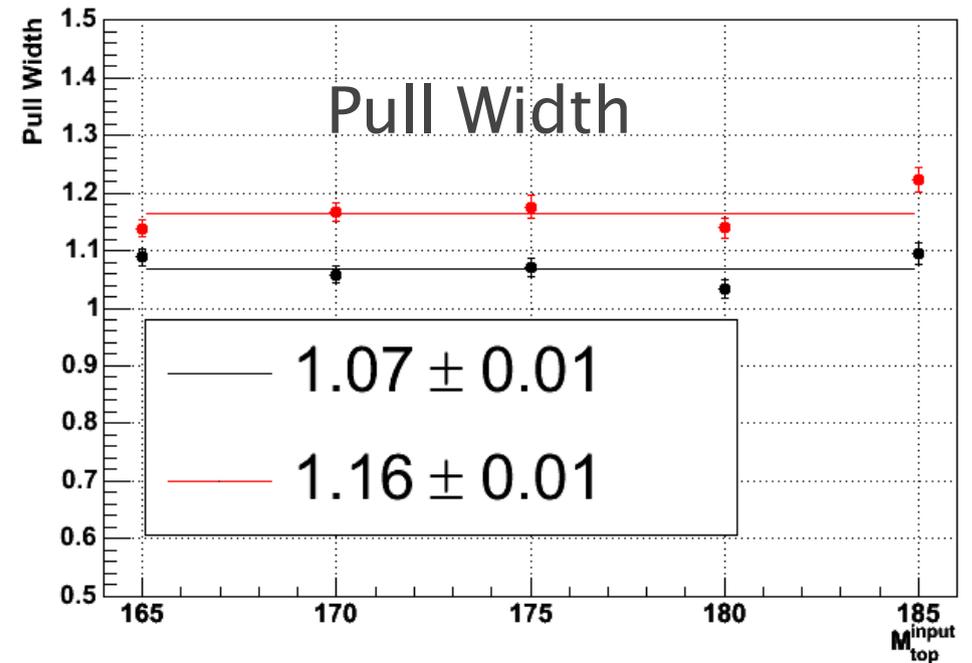
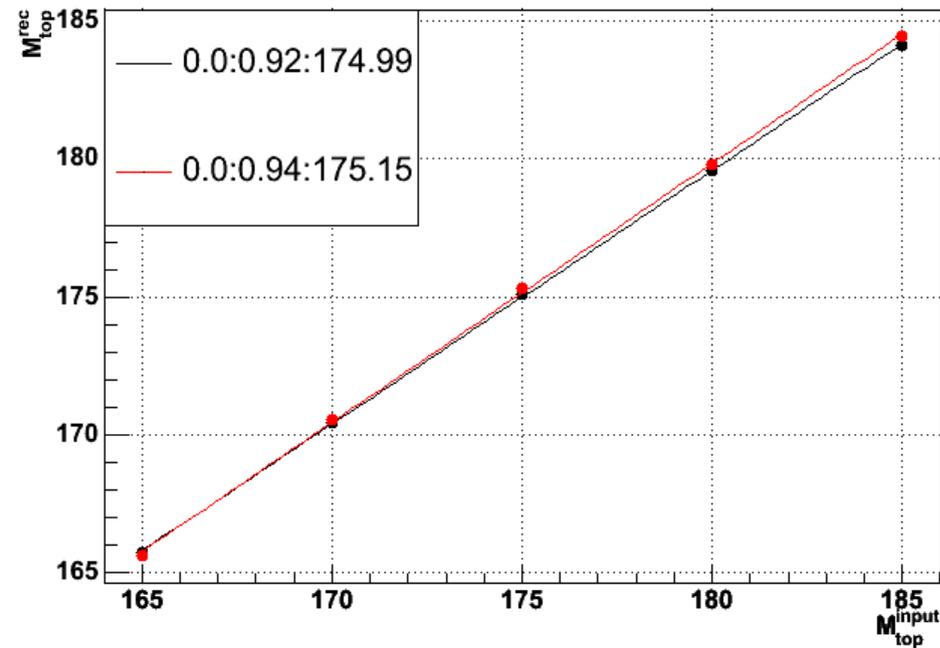


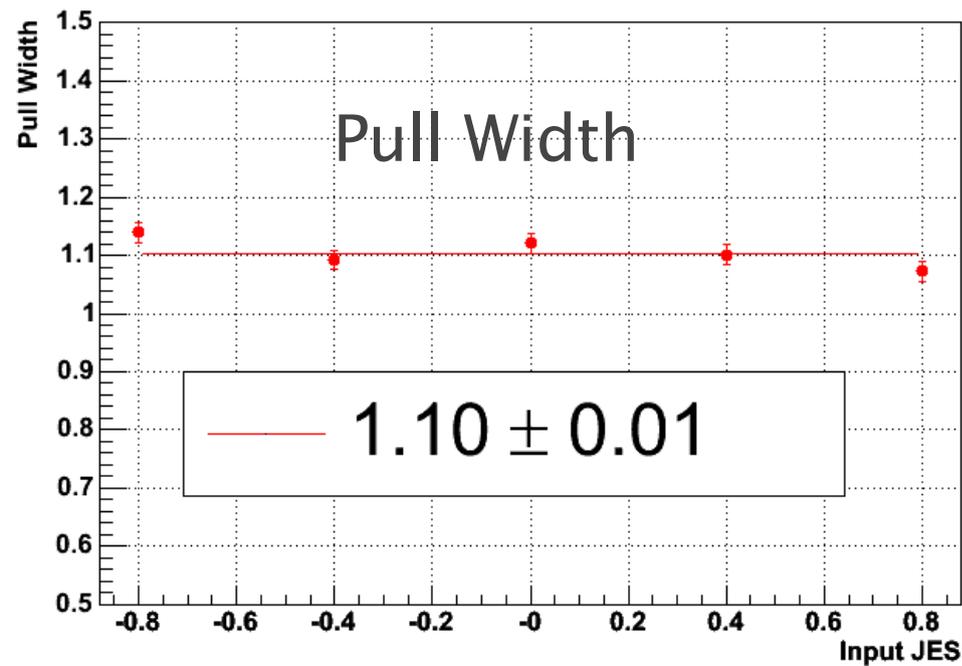
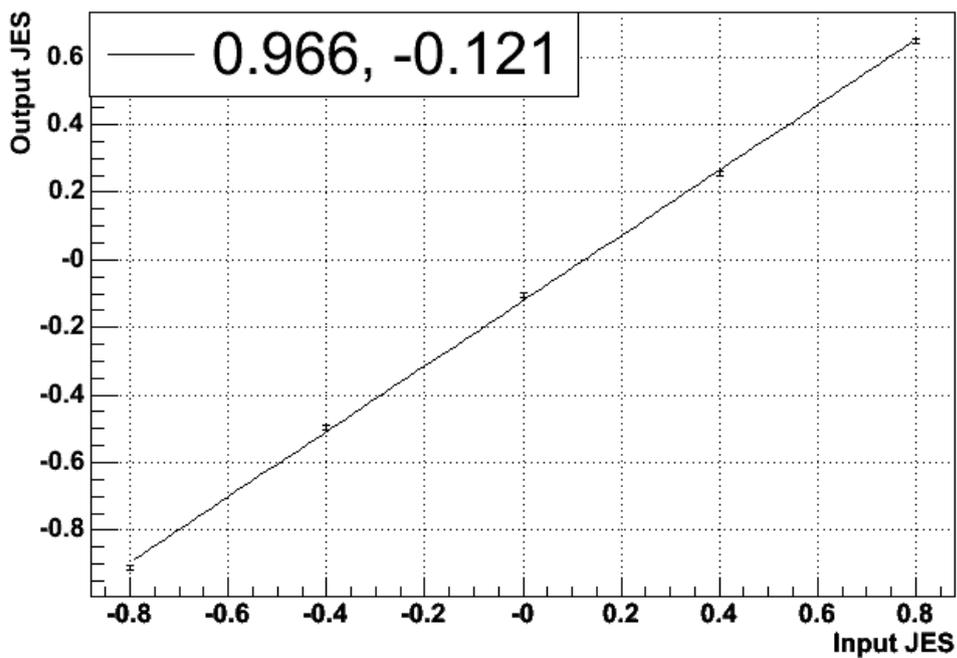
# Pseudo Experiments(Mtop)

1D vs 2D  
Right combination  
2500 PE's/point

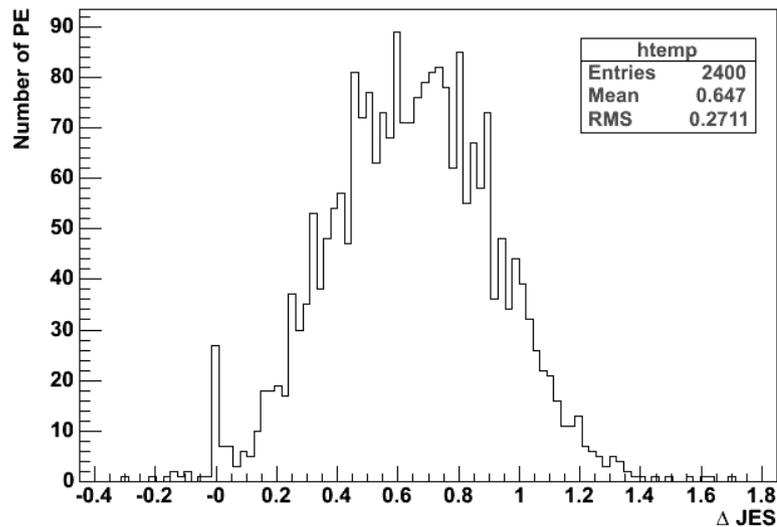
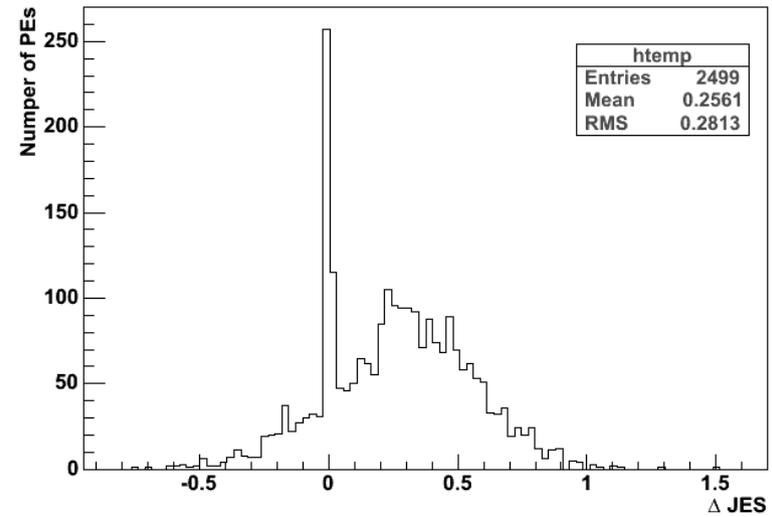
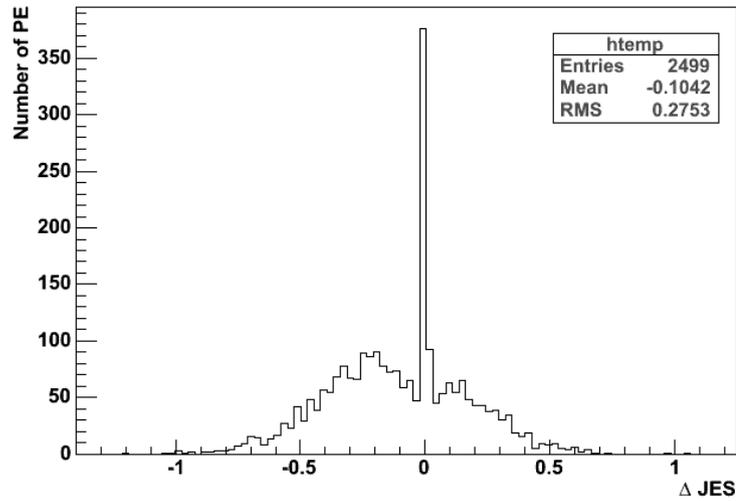


# Pseudo Experiments(JES)

Right combination  
2500 PE's/point

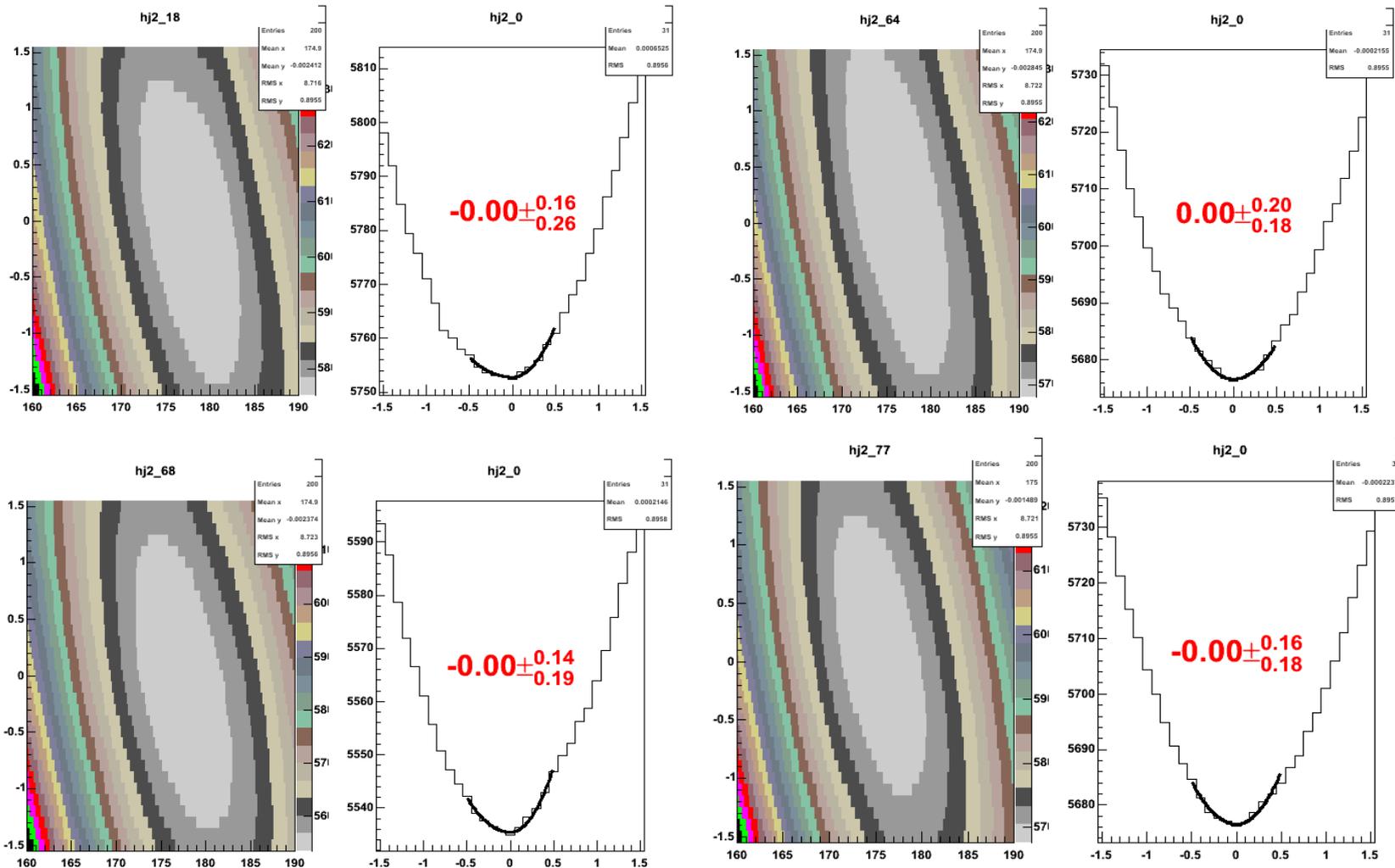


# Pseudo Experiments(JES)



**Bug?**

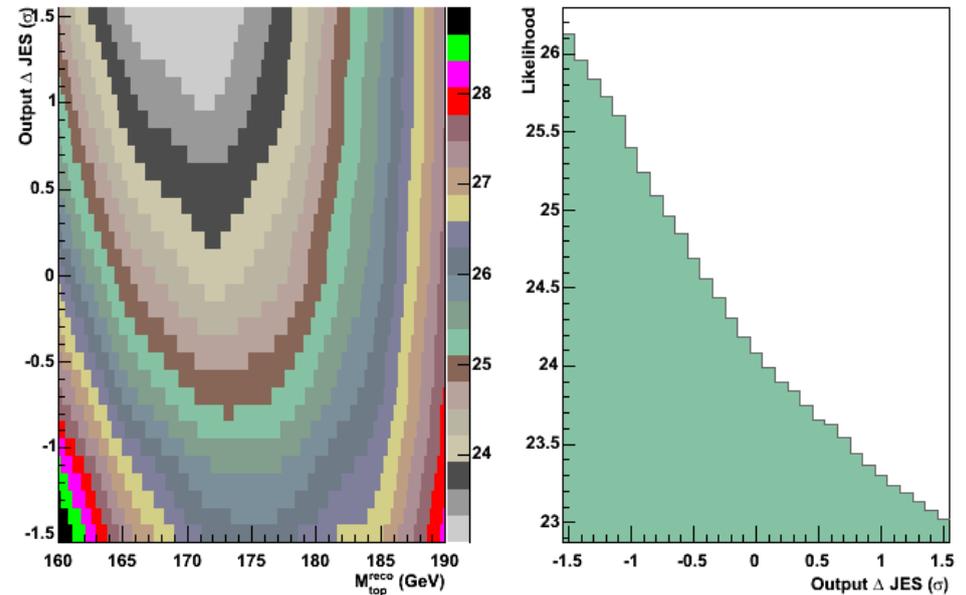
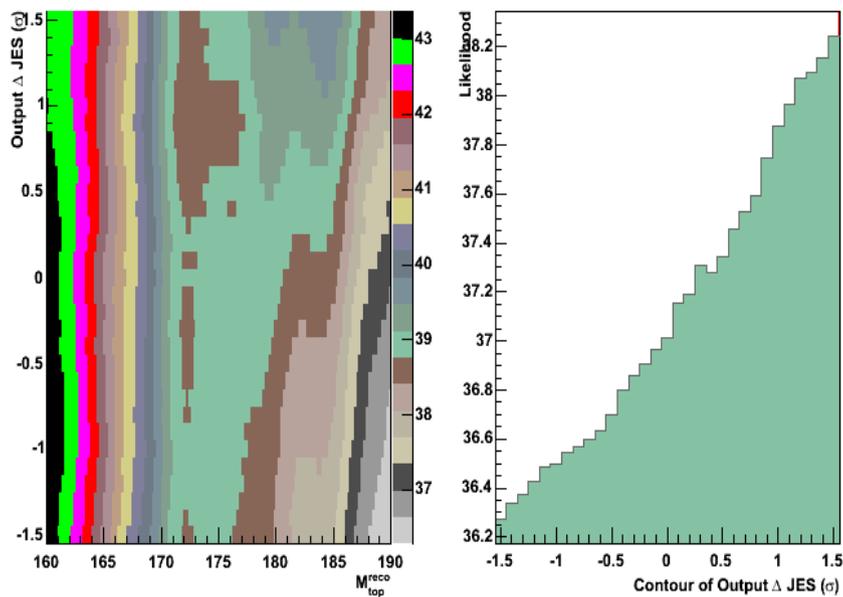
# JES likelihood/PE



Investigating now...

# Event likelihood

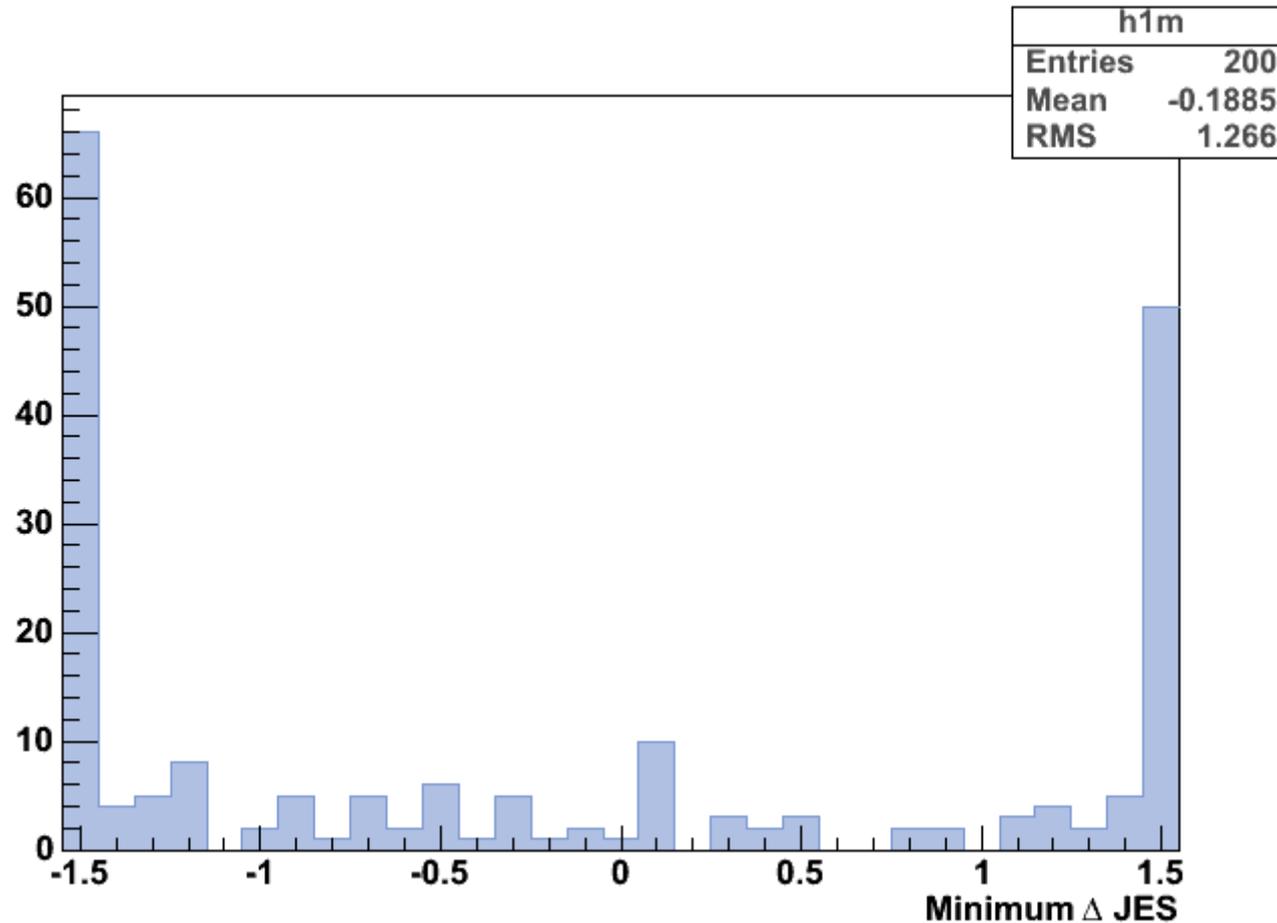
## Two examples of event likelihood



minimum point of these examples are out of range  
(-1.5~1.5)

# Minimum JES

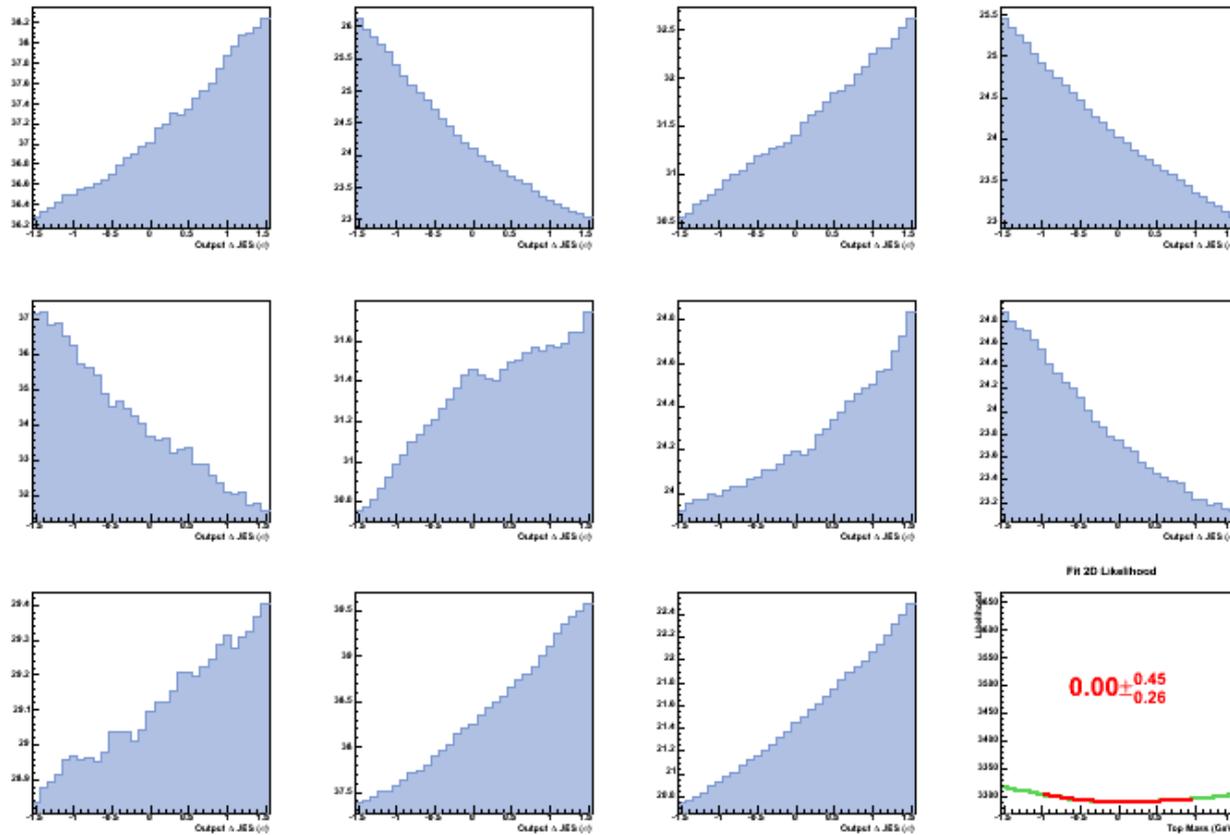
Minimum points for each event likelihood



There are many minimum points on boundary of range.

# Event/Joint likelihood

Joint likelihoods whose minimum point is on boundary.



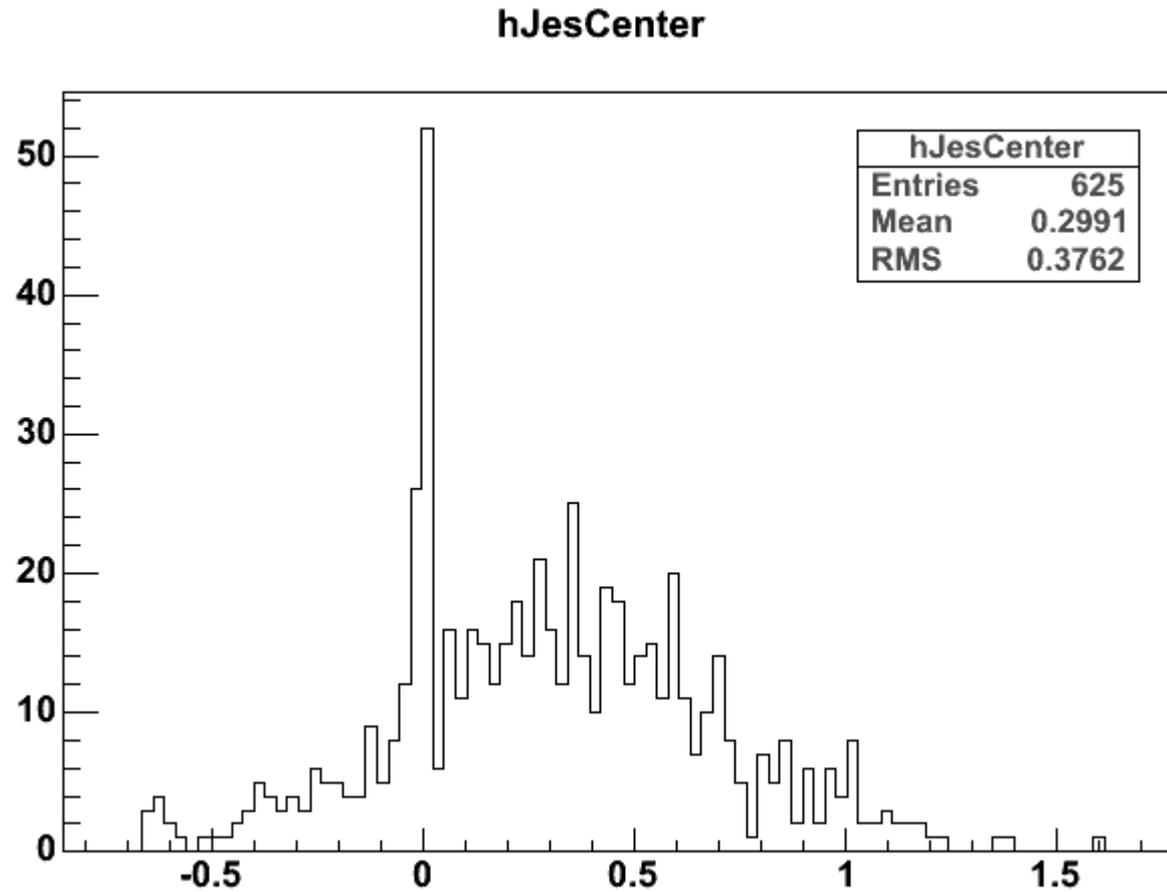
Scan range on JES should be extended.

# Plans

- **JES scan range**
  - **Make additional TF for extended range(Done)**
  - **Processing time will increase(~3000jobs on CAF)**
- **Shape study**
  - **Event selection for all backgrounds is almost done.**
- **Apply backgrounds**
- **Estimate systematic error**
  
- **Full status report on early June.**
  
- **1.2/fb or 1.7/fb**
  - **ntuple for 1.7/fb is ready**
  - **Background estimation for 1.7/fb is not done yet.**

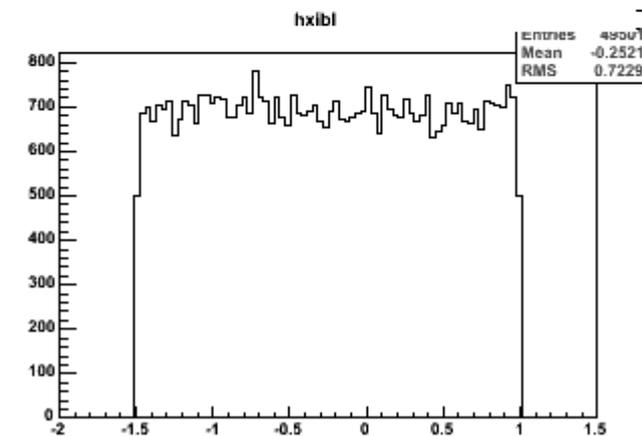
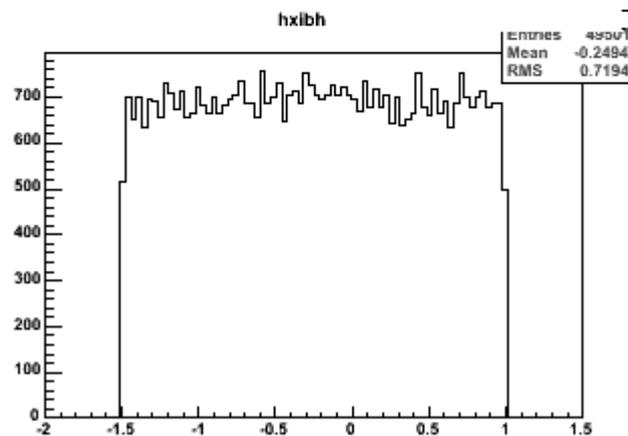
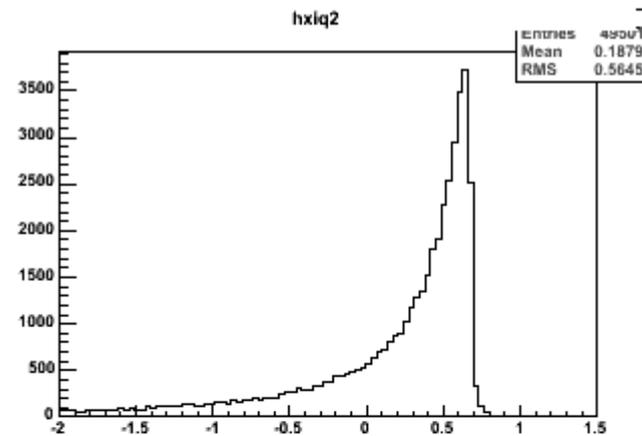
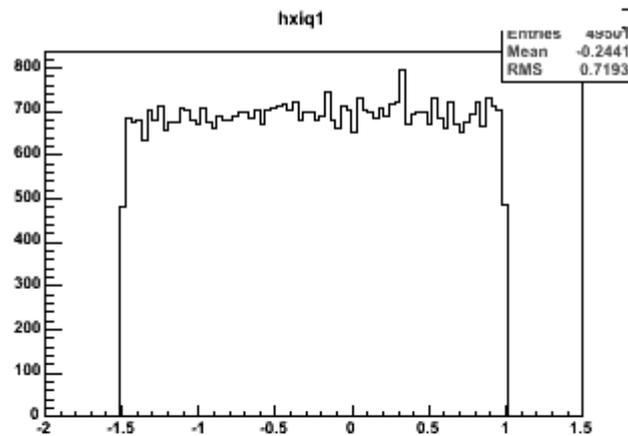
# Bug for JES calibration

After extended scan range for delta JES



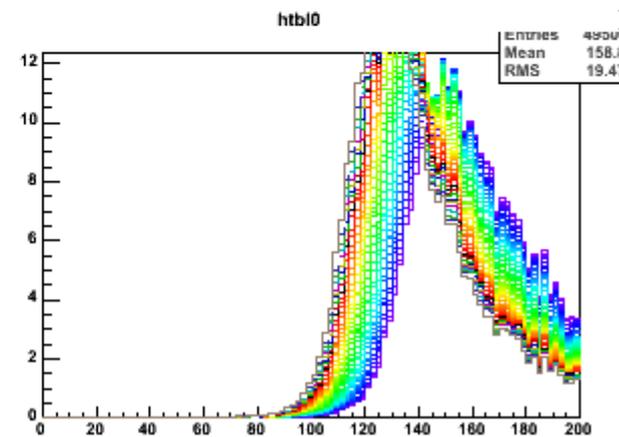
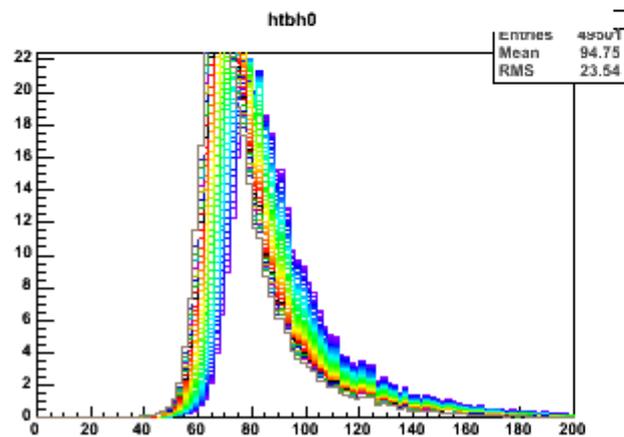
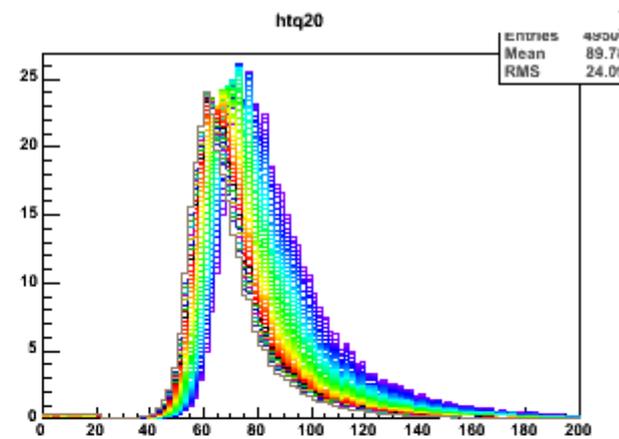
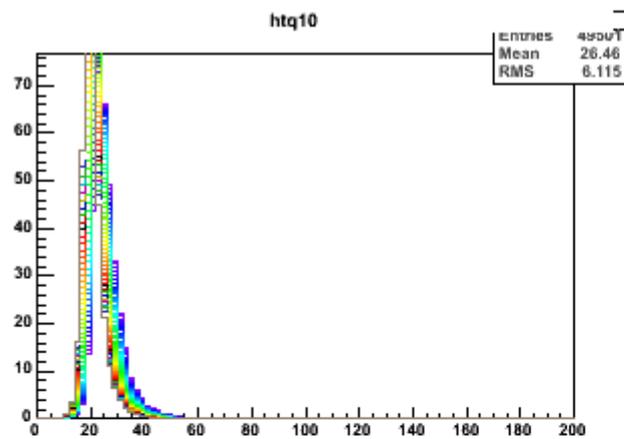
# Checking weight from TF

## Distributions for generated xi randomly



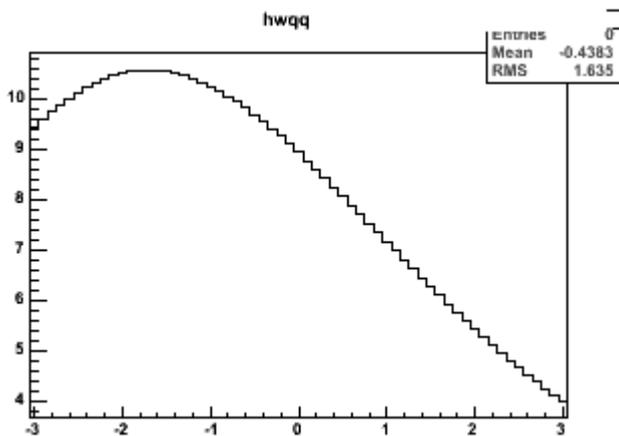
# Checking weight from TF

## Reconstructed jets with TF for one event

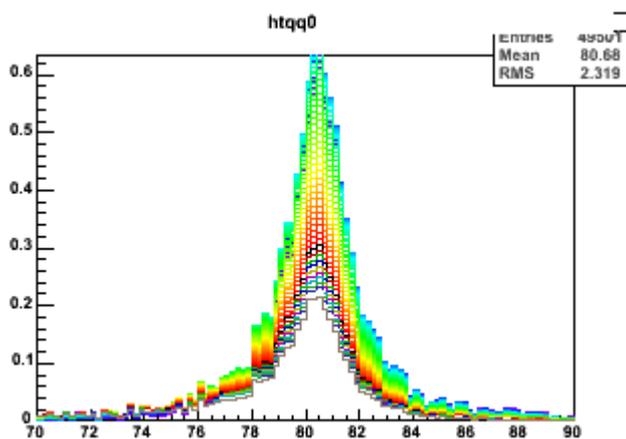
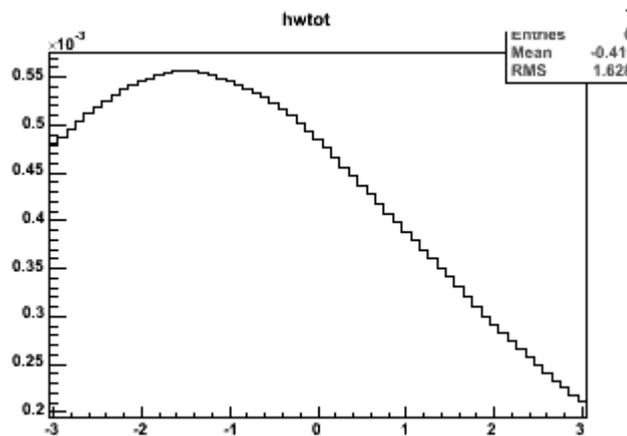


# Checking weight from TF

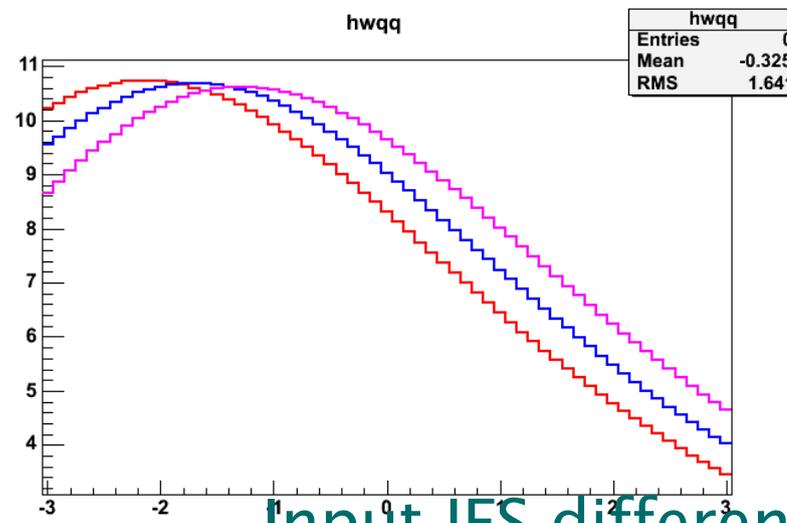
## Weight for $W \rightarrow 2j$



## Weight for $4j$

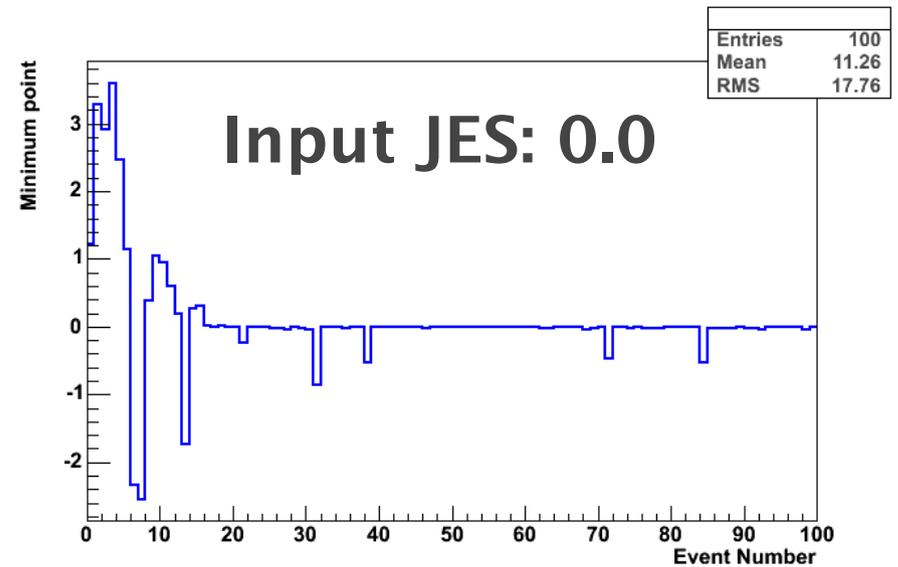
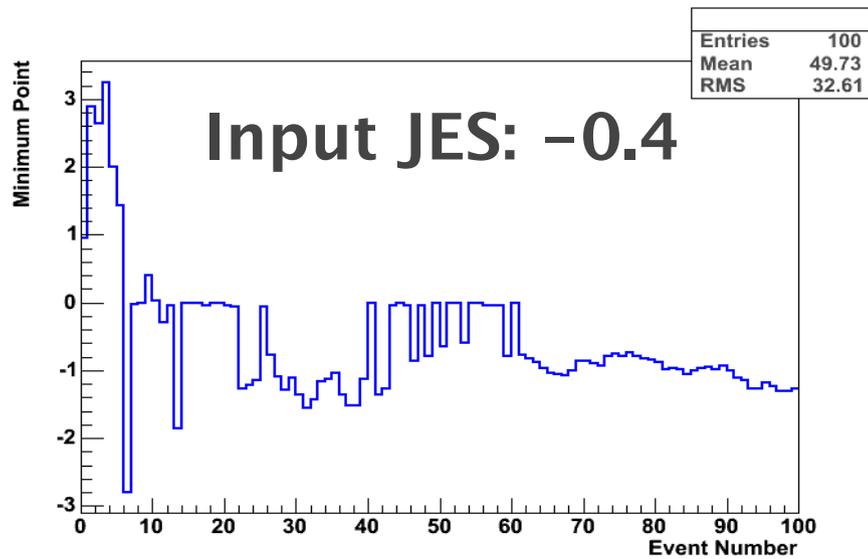


## Reconstructed $S_w$ in an event

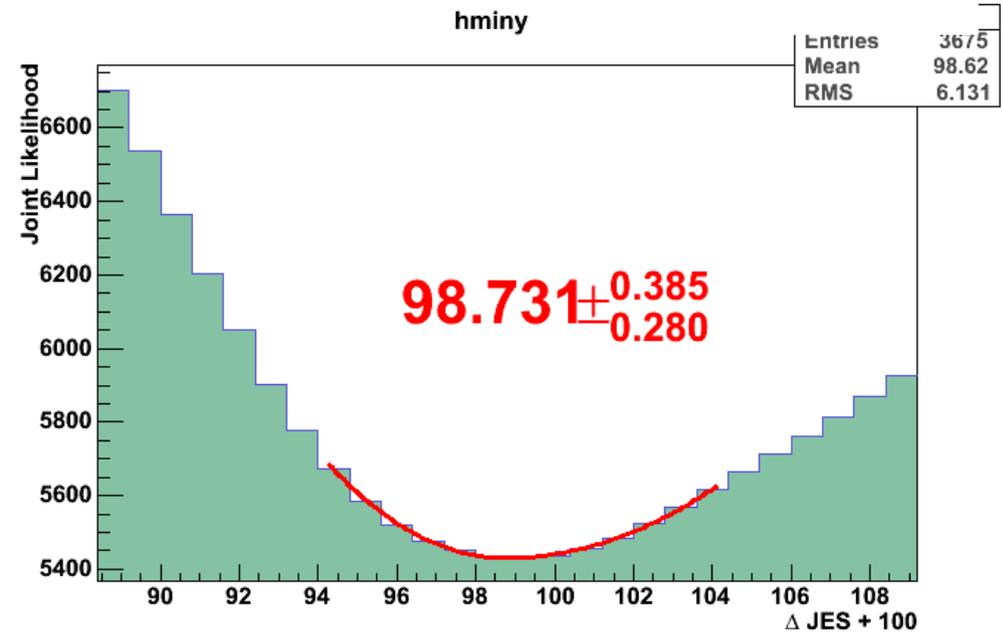
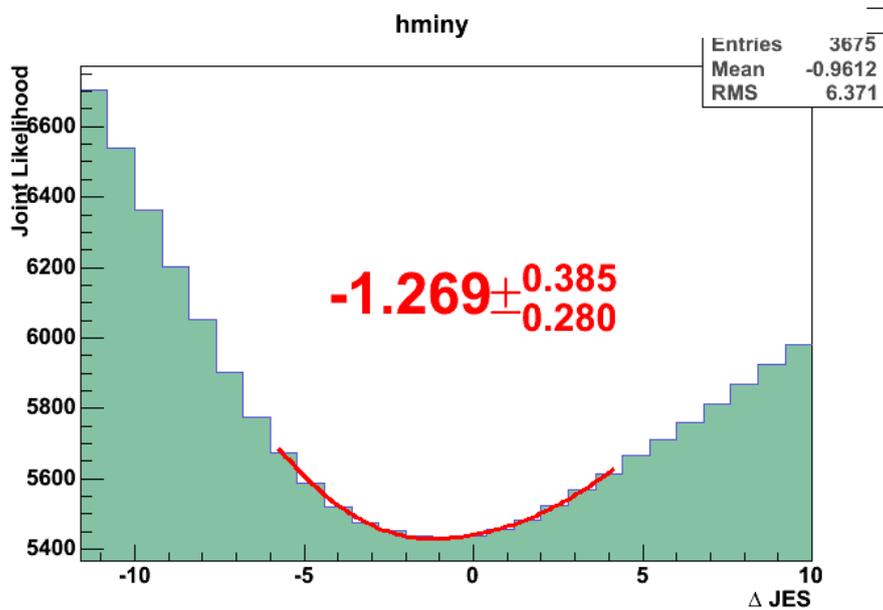


## Input JES differences

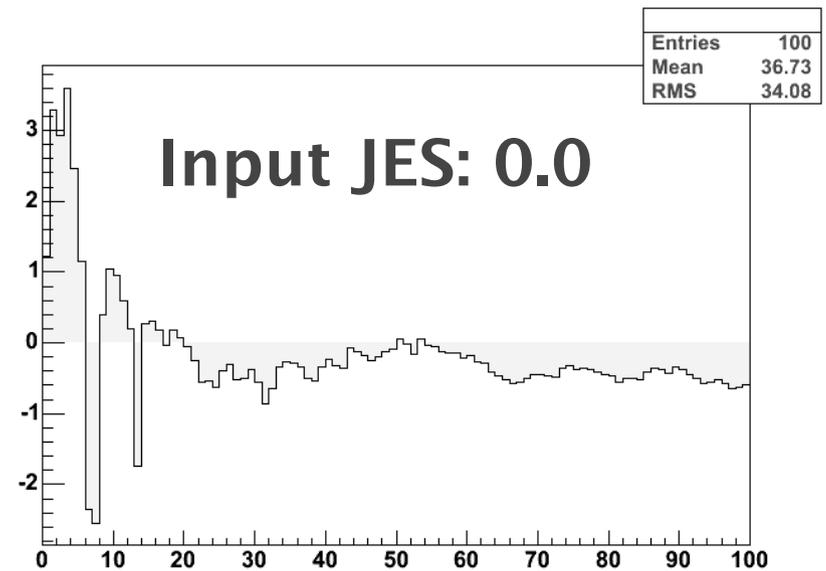
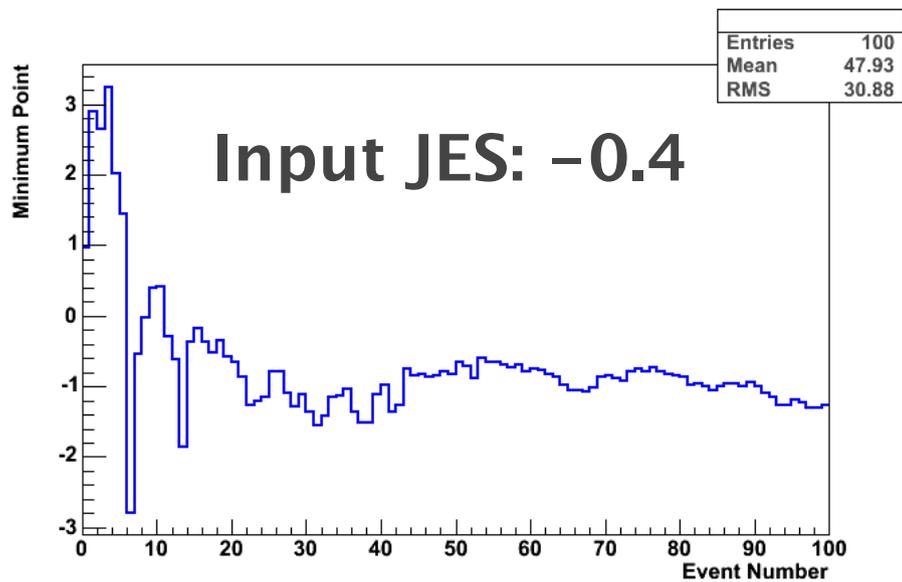
# Checking weight from TF



# Checking weight from TF

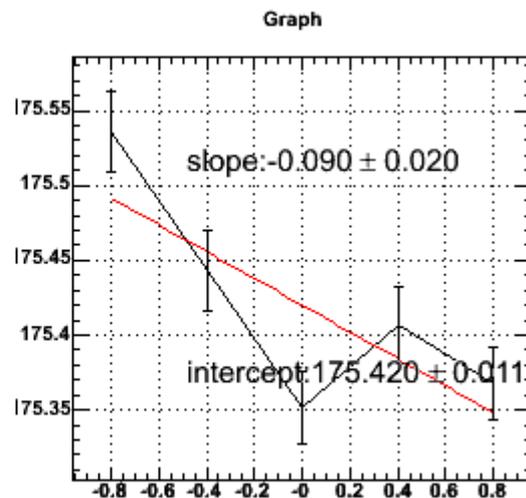
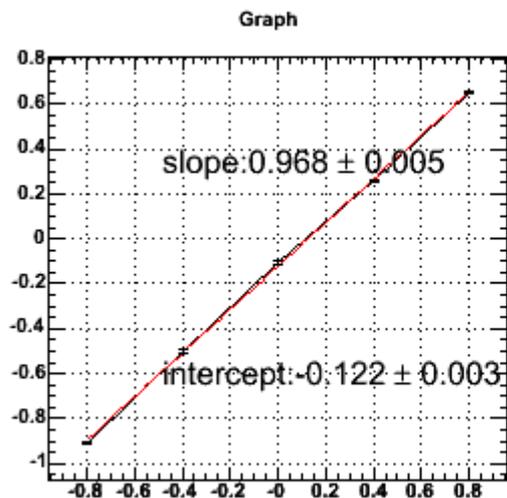


# Checking weight from TF



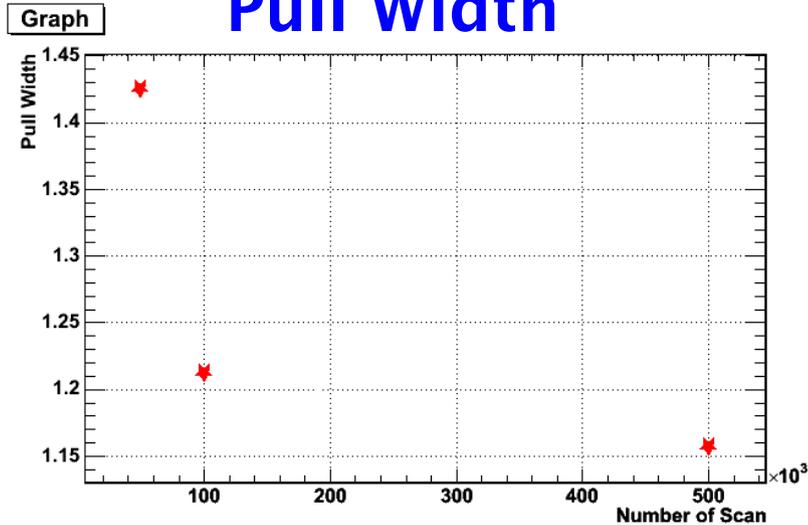
# Pseudo Experiments

- Slope for JES is almost 1.
- Output JES shift lower
- Dispersion of reconstructed mass is taken as systematic uncertainty.



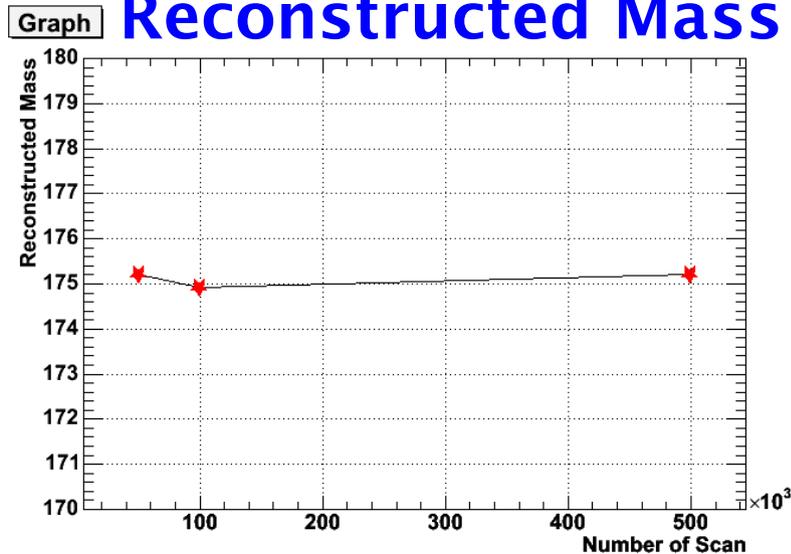
# Pull Width for Mass Reconstruction

## Pull Width

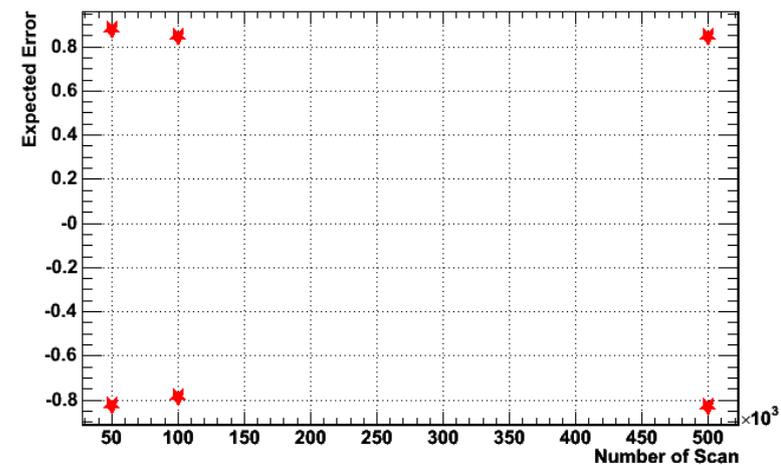


- Pull Width goes down as # of scan increase although it still high.
  - Effect of removing importance sampling??
- Reconstructed Mass and Expected Error is almost flat as a function of # of scan

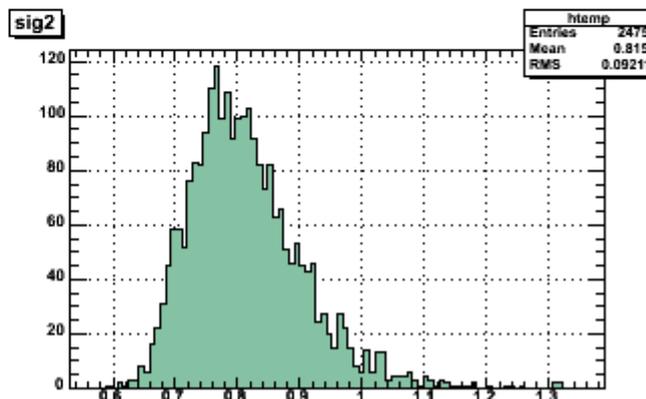
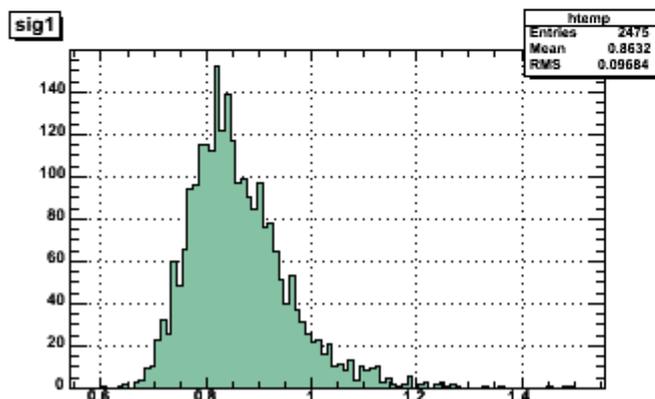
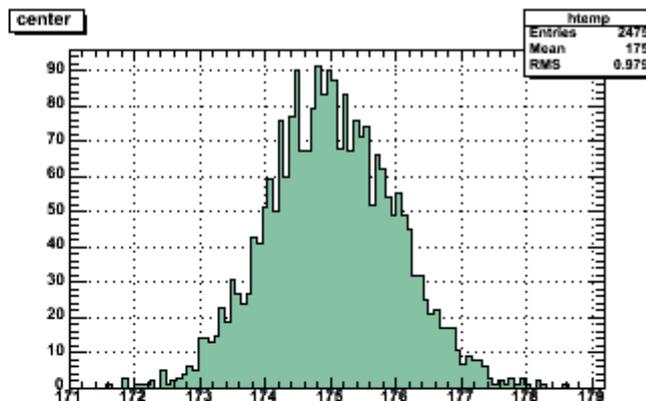
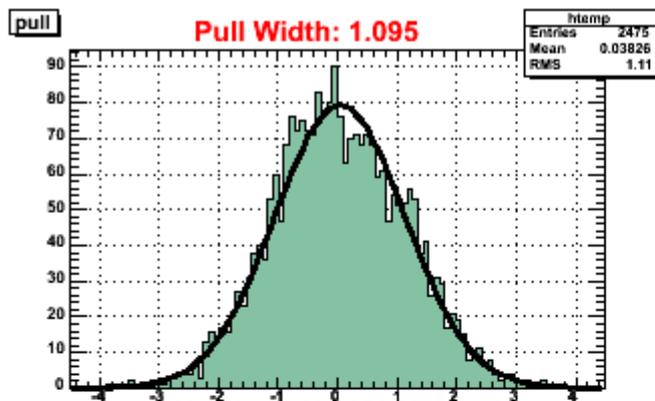
## Reconstructed Mass



## Expected Error



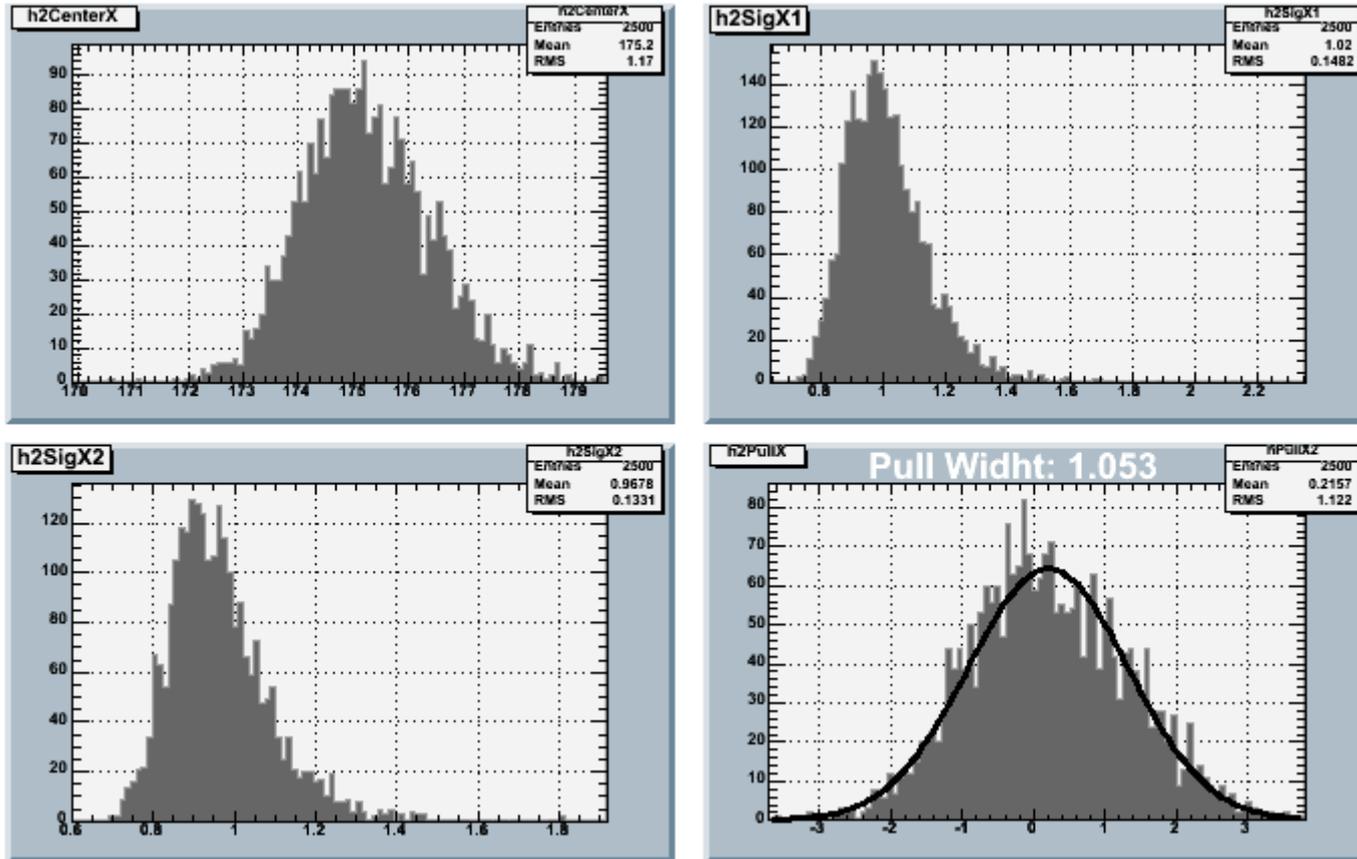
# 1M Scans



Pull width is still high

# Importance sampling

50k scans

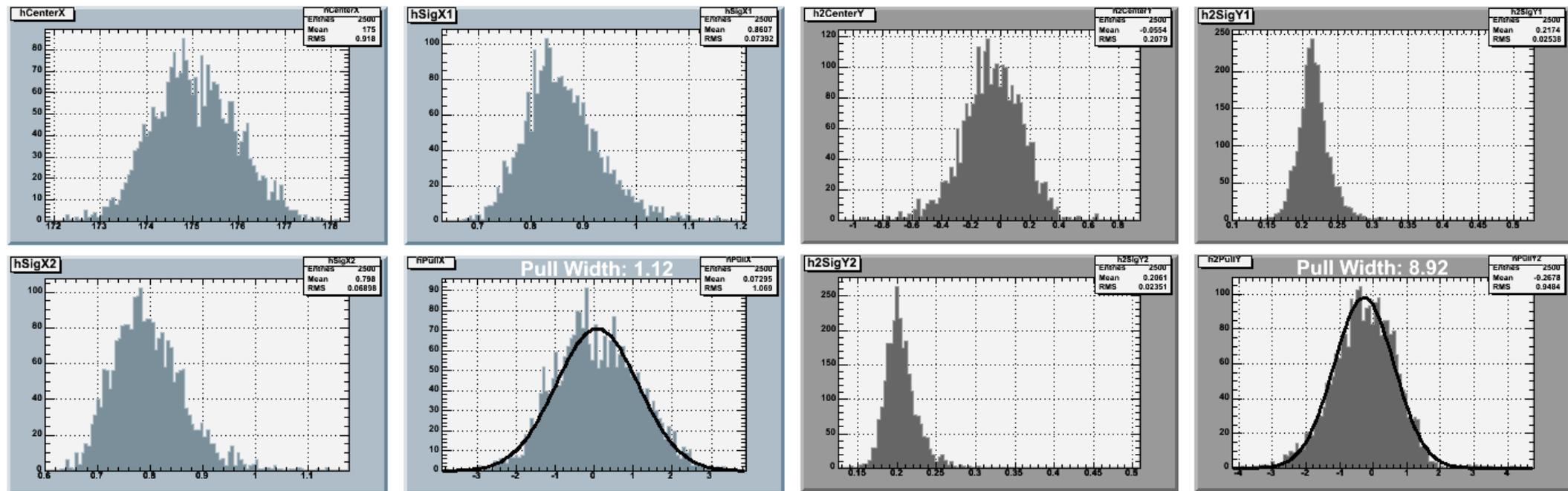


Pull width is reasonable?

# Importance sampling 2D

Mass

JES

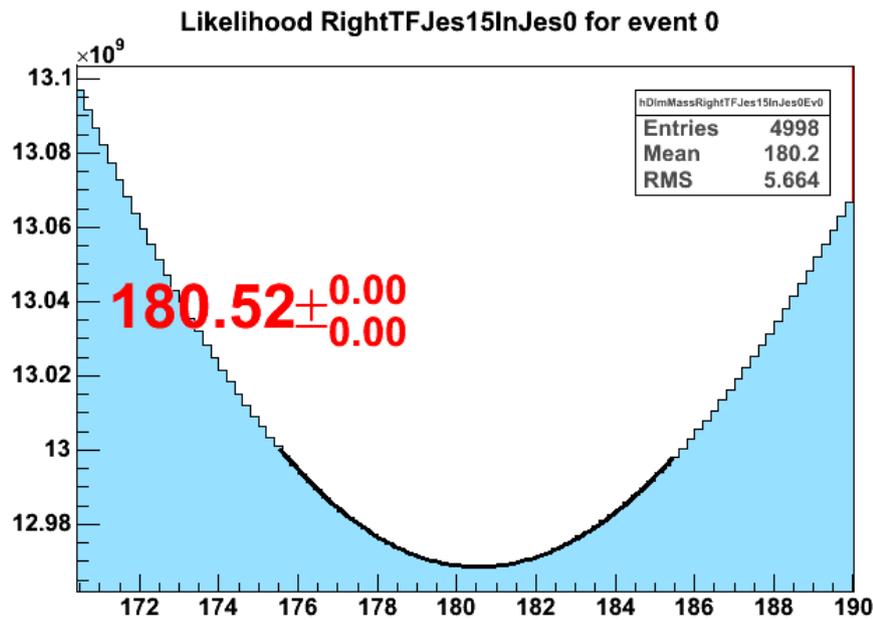


Pull width goes higher

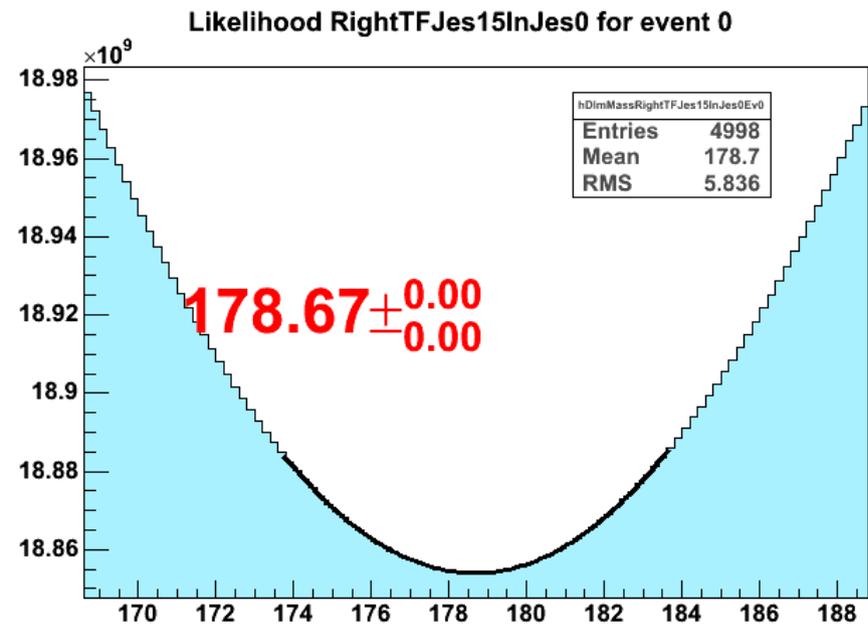
Pull width is low

# Joint likelihood/path

with M\*Gamma

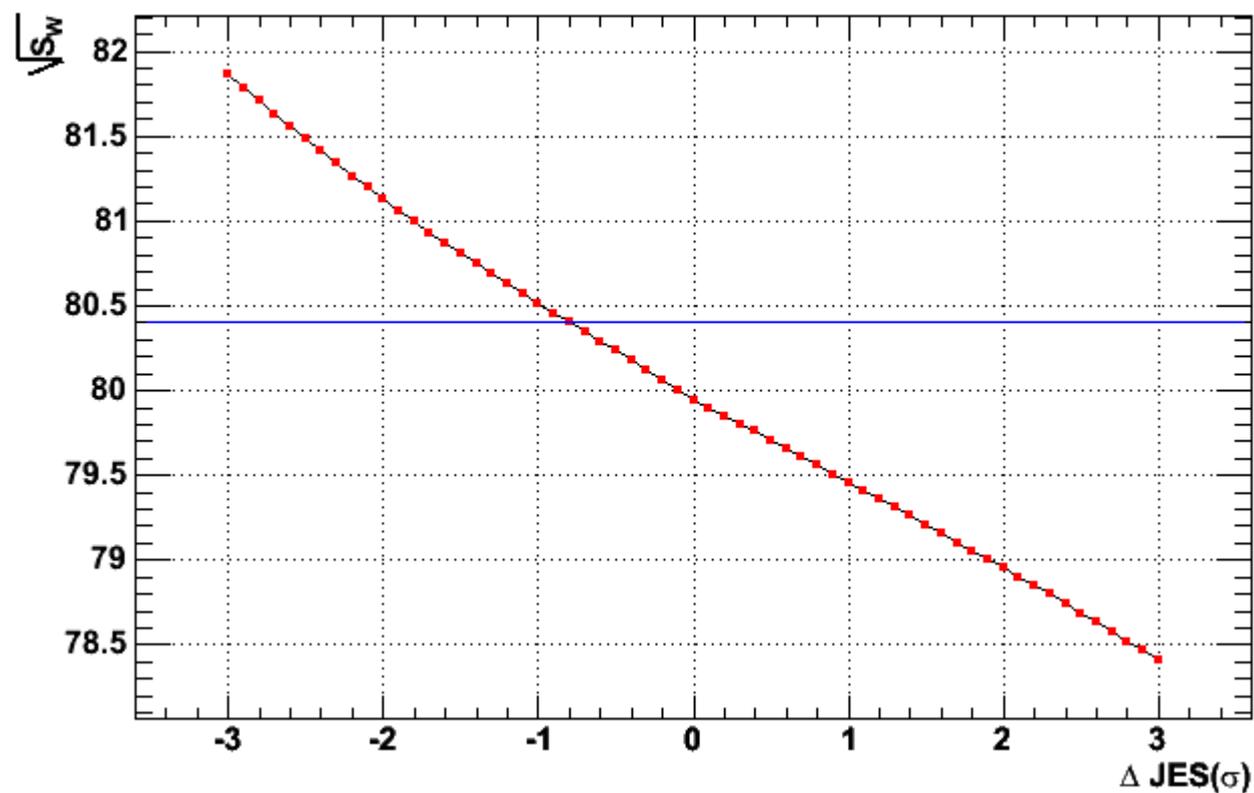


w/o M\*Gamma



# Invariant mass of W

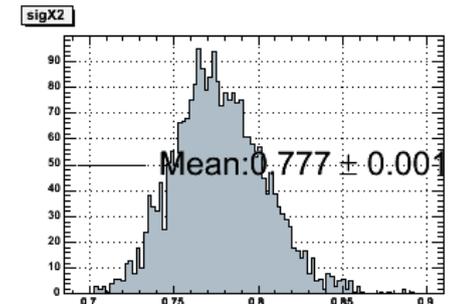
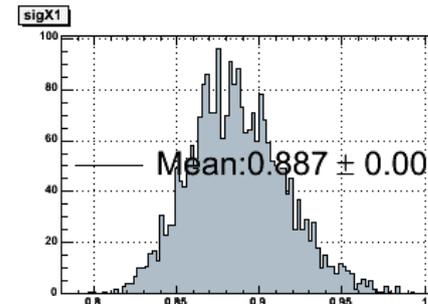
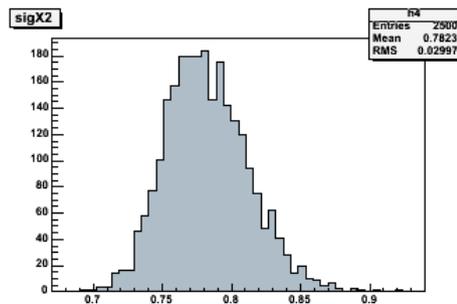
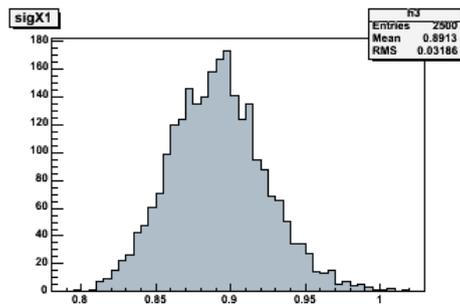
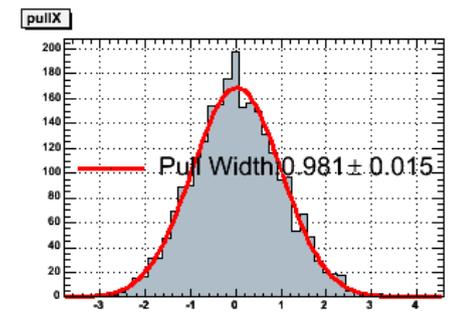
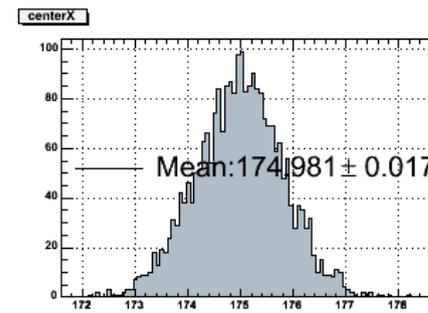
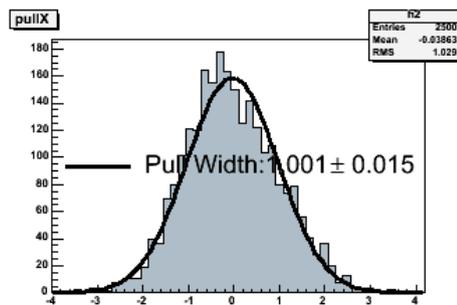
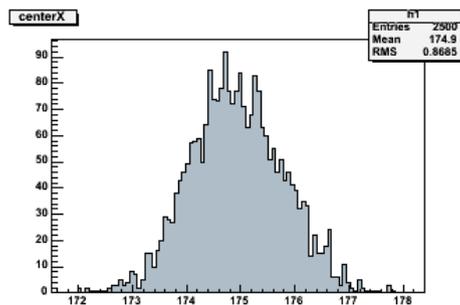
Graph



# Importance sampling 1D

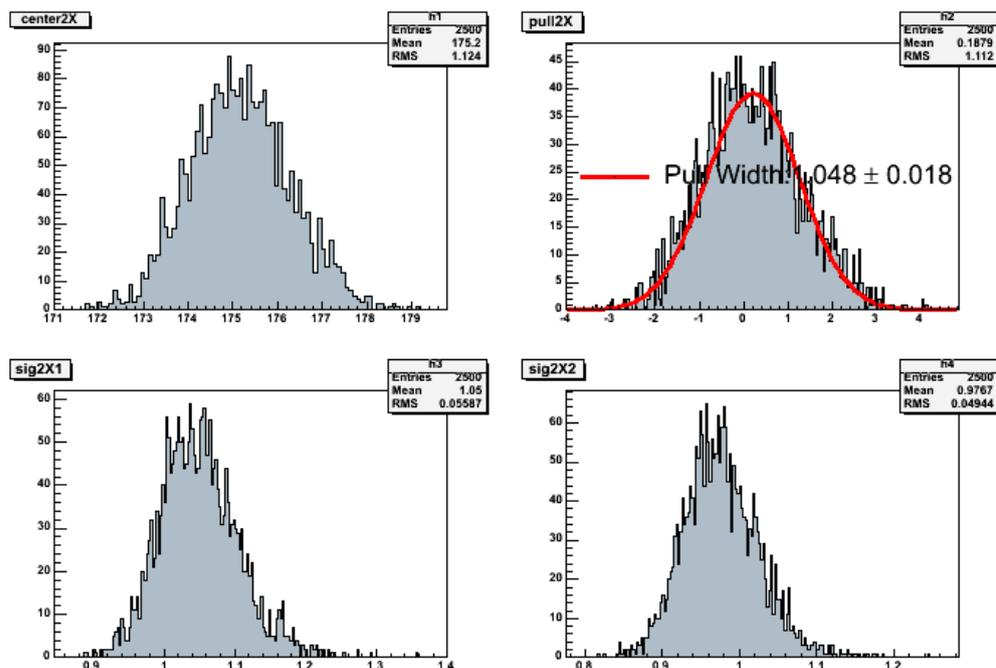
100k scans

200k scans

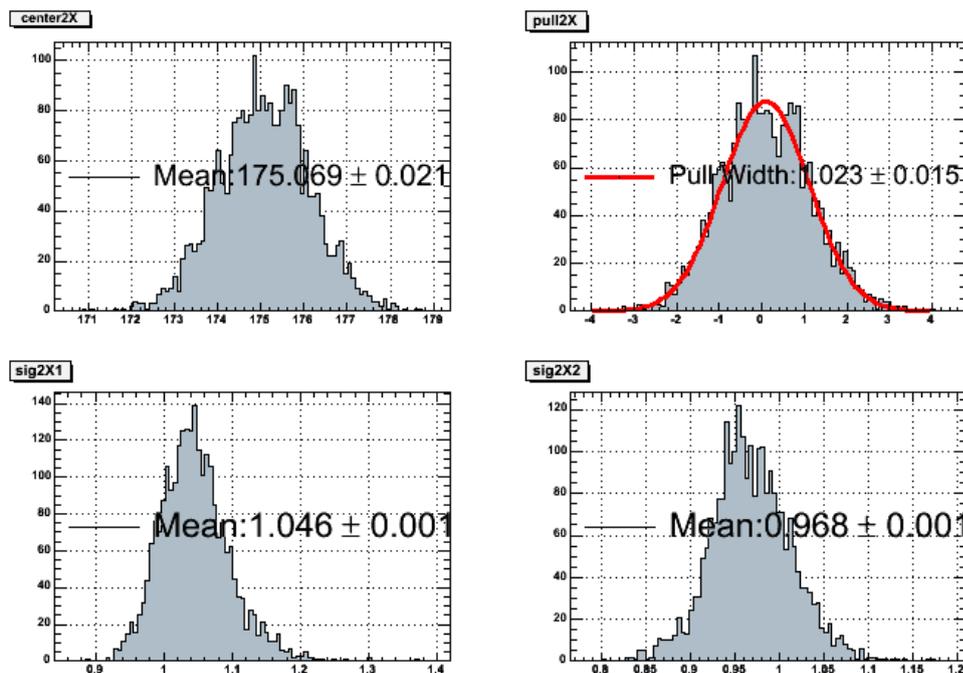


# Importance sampling 2D

100k scans



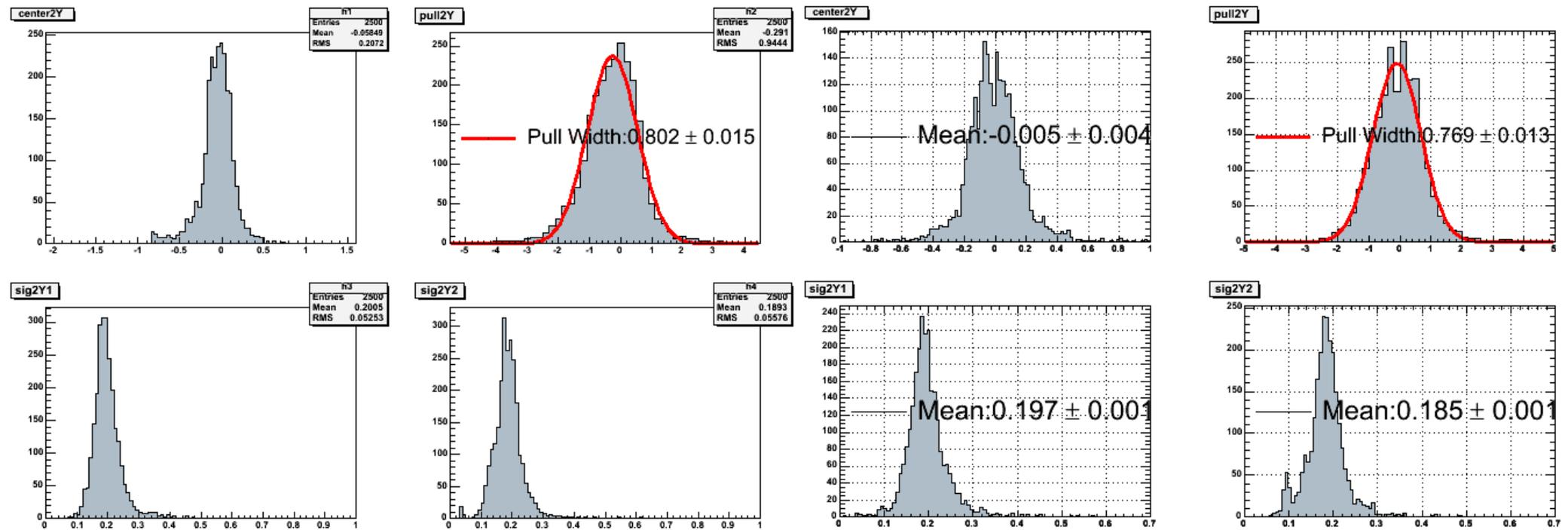
200k scans



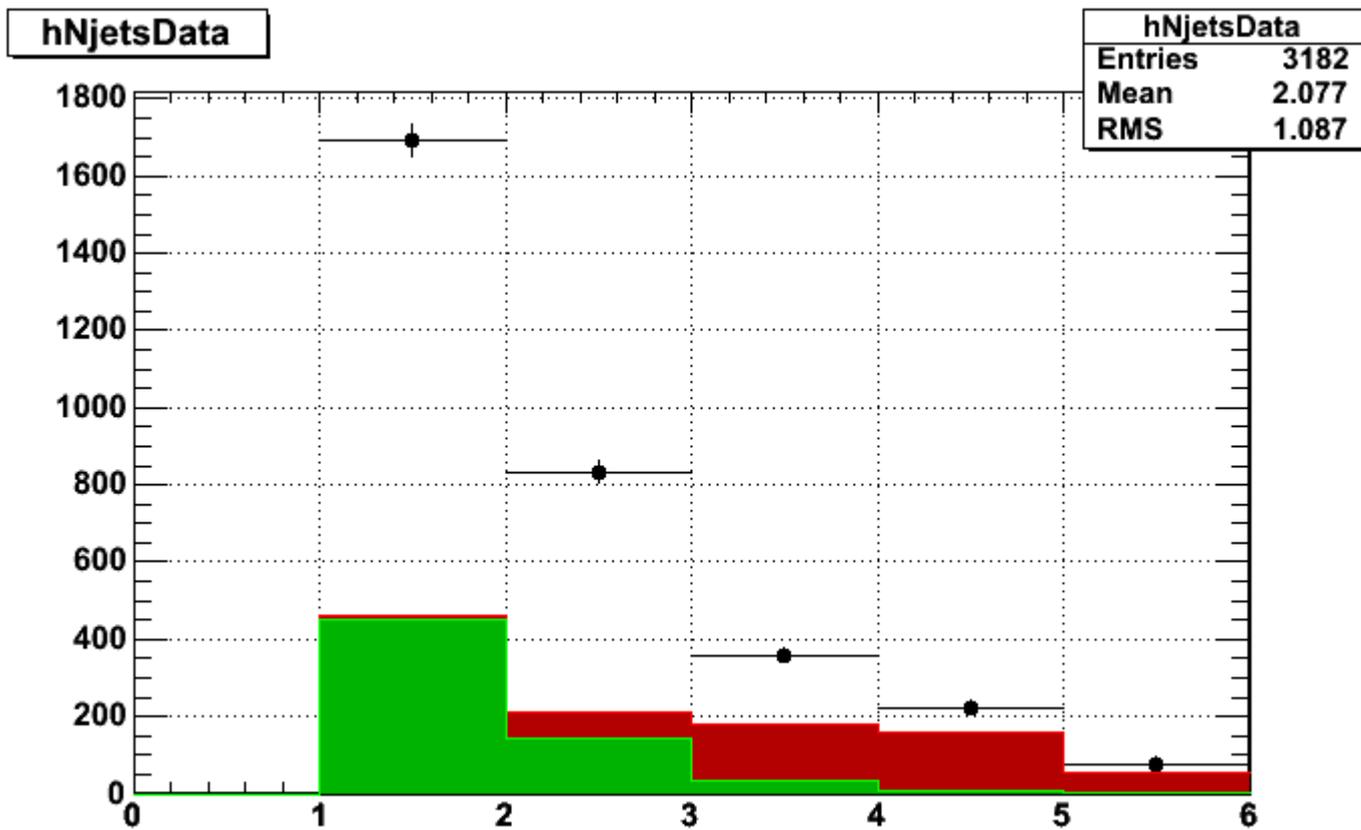
# Importance sampling 2D

100k scans

200k scans



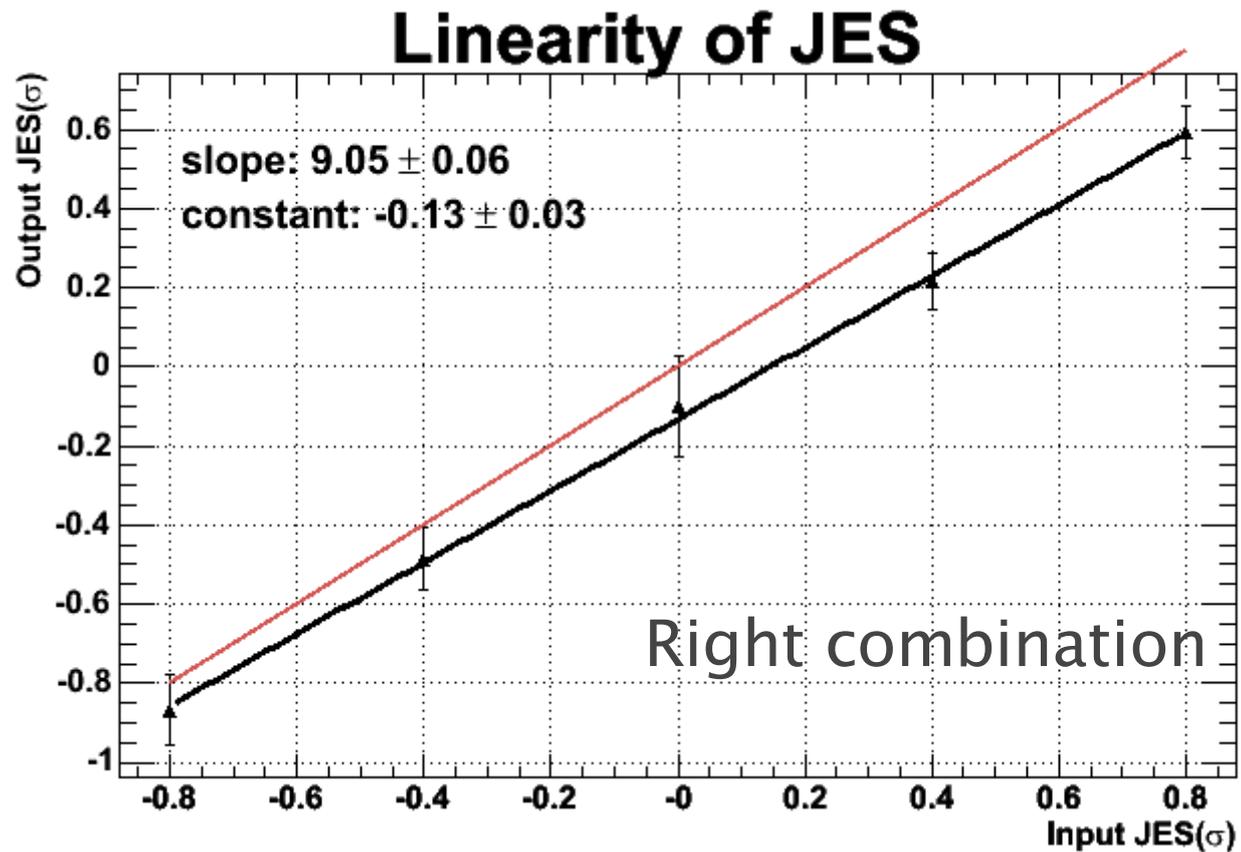
# Background



# Plan

- Process DLM for all the signal and background MC this weekend
  - Scan: 100k
  - Calibrated TF
  - 1ev/h: ~10000 medium jobs on CAF
- Event selection for new data(2fb-1) done by this week end
- Kinematic shapes
- Period 11(2fb-1) background estimation will be done by end of June
- Pseudo experiments will be calculated after 2fb background ready
- Blind samples should be run over by Full Status report
  
- Status Report : 07/3/2007?
  - linearity and pulls for signal samples( background samples if possible)
- Full Status : 07/10/2007
- Prebless : 07/18/2007
- Go back to Japan : 07/20/2007
- Bless : After going back to Japan

# Linearity of JES



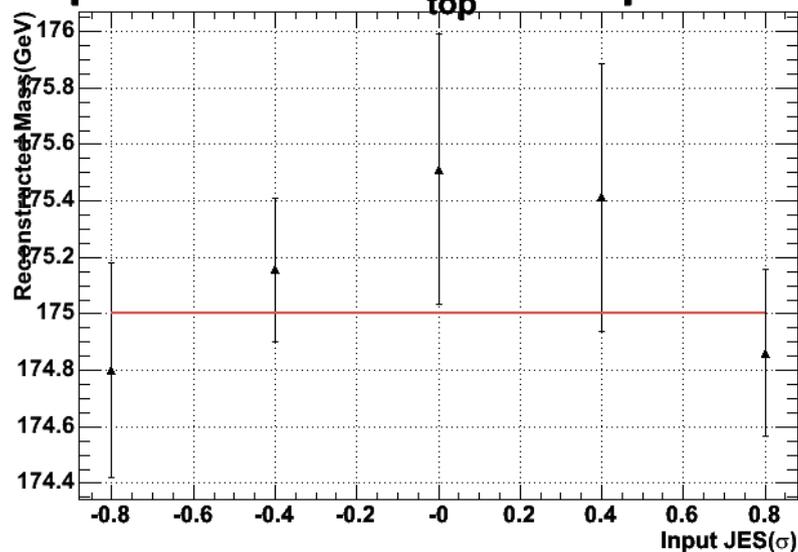
Linearity of JES is not perfect

So we have to calibrate TF by this slope and constants

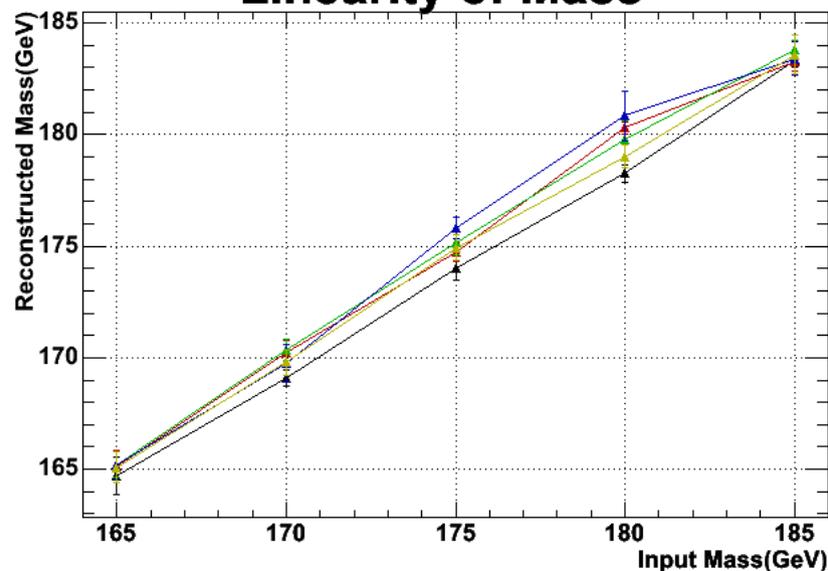
# Mtop & JES Calibration

- The effects which we have to calibrate
  - ✓ Wrong combinations effect
  - ✓ Background effect
- The effects are corrected by mapping function
  - ✓ We assume that reconstructed Mtop and output JES should not depend on each other.
  - ✓ So we take mapping function from  $\Delta\text{JES}=0.0$  sample to correct Mtop
  - ✓ The way of JES correction is same as Mtop

Dependences of  $M_{\text{top}}^{\text{reco}}$  on Input  $\Delta\text{JES}$



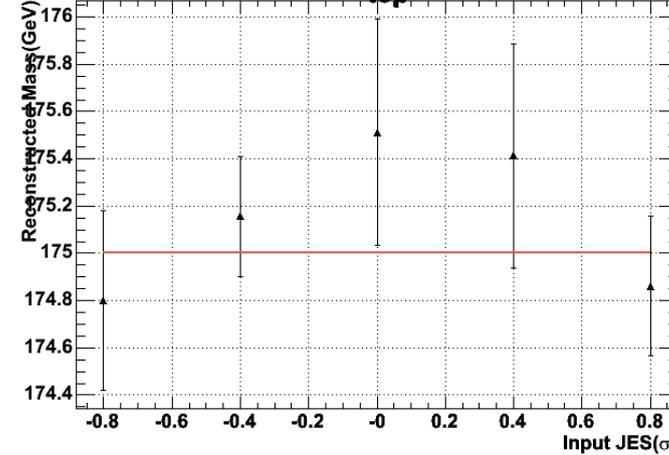
Linearity of Mass



# Systematic uncertainty

- Residual JES

Dependences of  $M_{top}^{reco}$  on Input  $\Delta$  JES



- PDF
- ISR and FSR(more and less)
- MC generator(PYTHIA and HERWIG)
- Gluon Fraction(NLO effects)
- Background composition
- Multiple interaction
- b-jet energy scale
- b-tagging scale factor

# Plan

- Time estimation
  - matched events process
    - input mass: 165, 170, 175, 180, 185 = 5 samples
    - input JES : -0.8, -0.4, 0.0, 0.4, 0.8 = 5 samples
    - ~10000 events for each sample → 100k events
  - unmatched events process
    - 5 mass point X 5 JES point = 25 samples
    - 10k X 25 = 250k events
  - Background
    - mistag, wbb, wc, wcc, nonW, diboson, sigle top
    - 30% of top = 3000 events/JES
  - blind sample
    - 5 mass sample: 5k events X 5 = 25k events
    - 5 JES sample: 5k events X 5 = 25k events
  - systematic uncertainty
    - ???
  - Total: ~400k events
  - CAF medium job can process 20 events → 20000 jobs