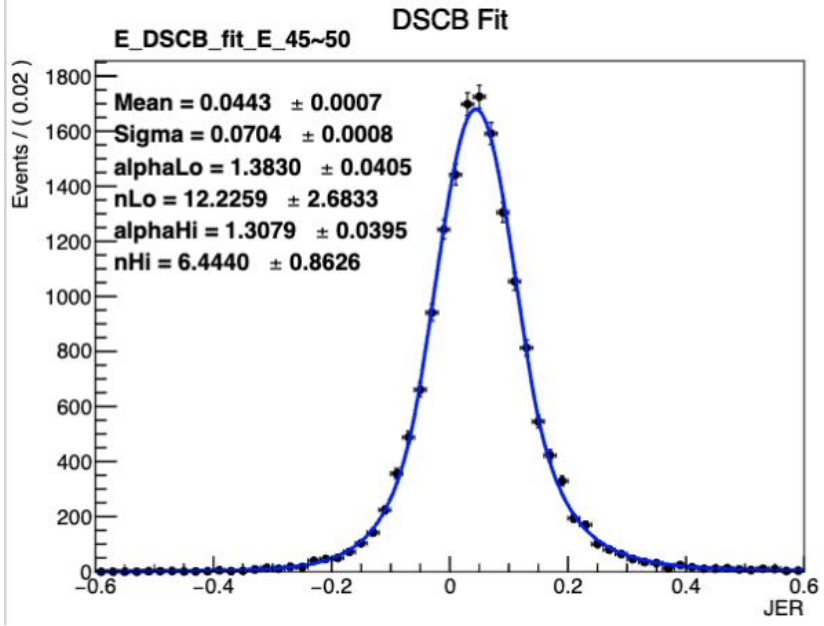
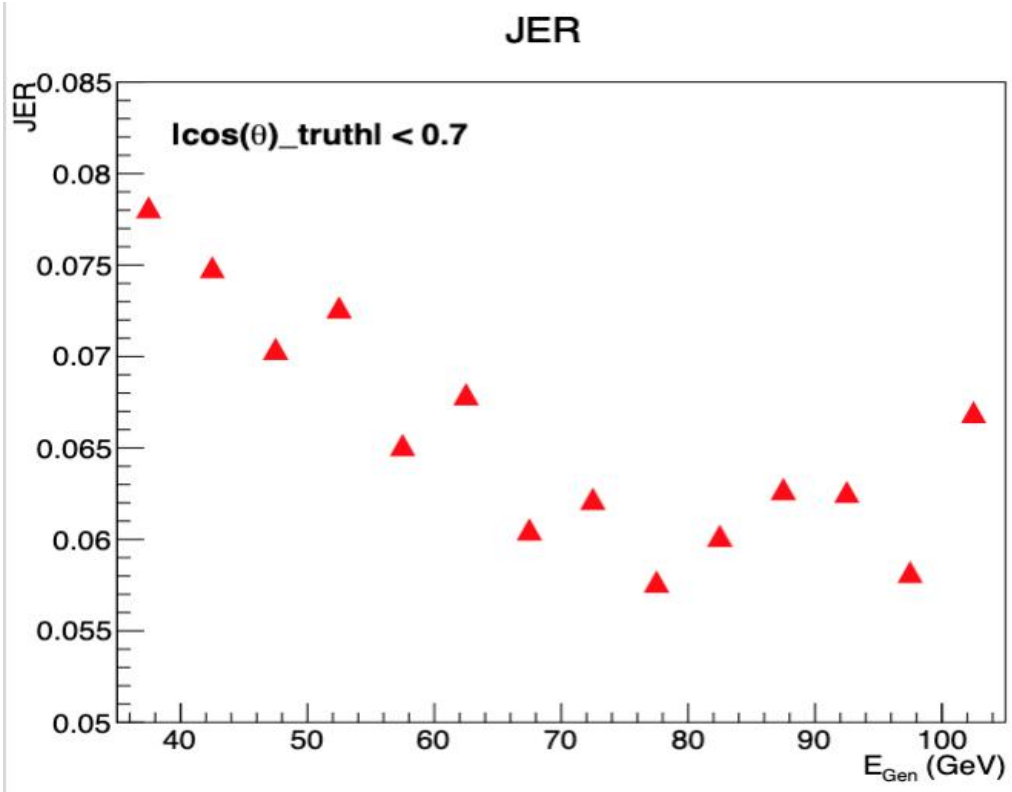
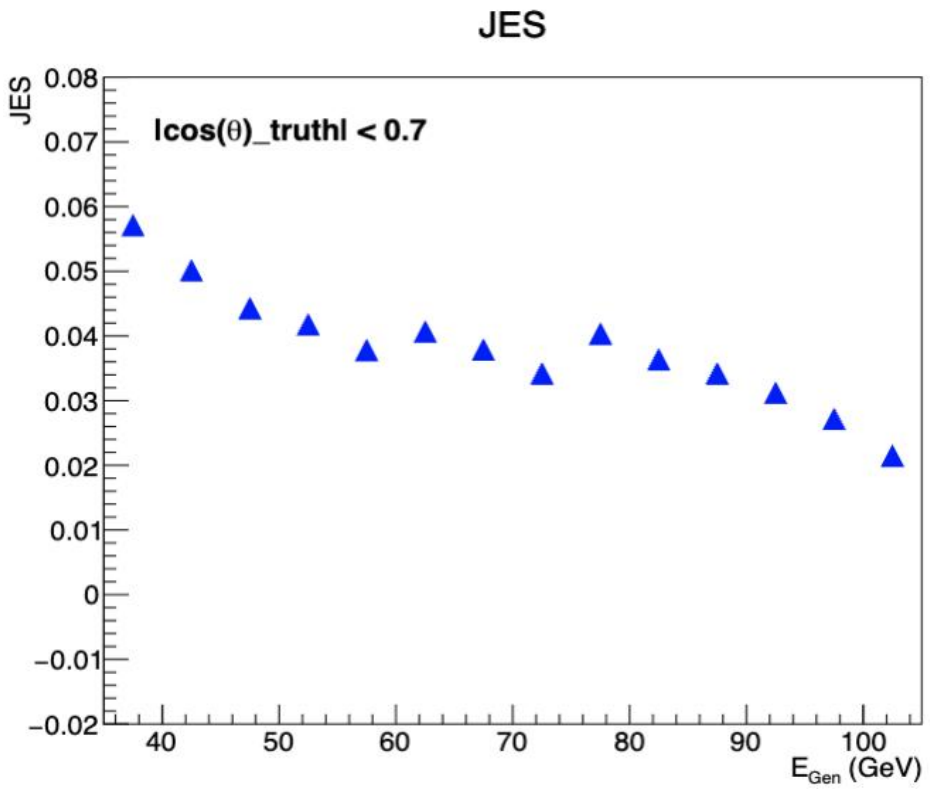
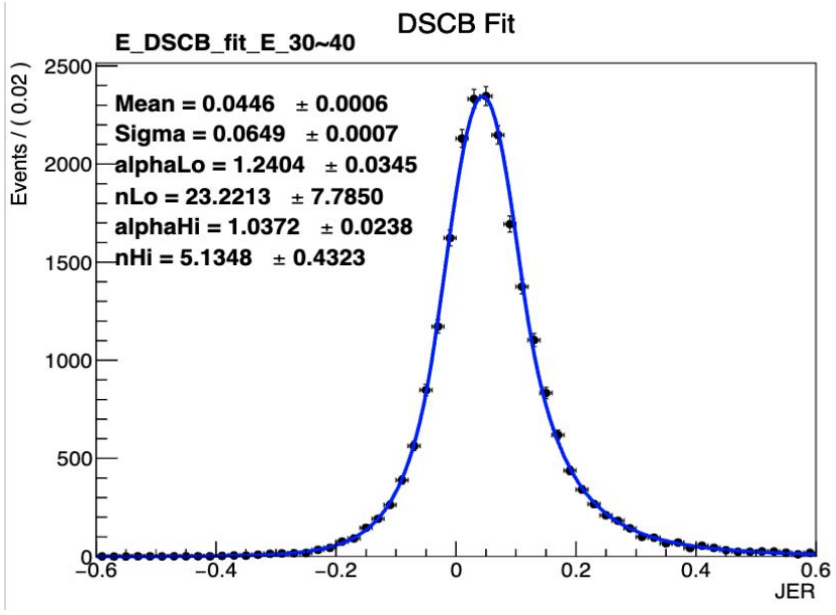
vvHgg

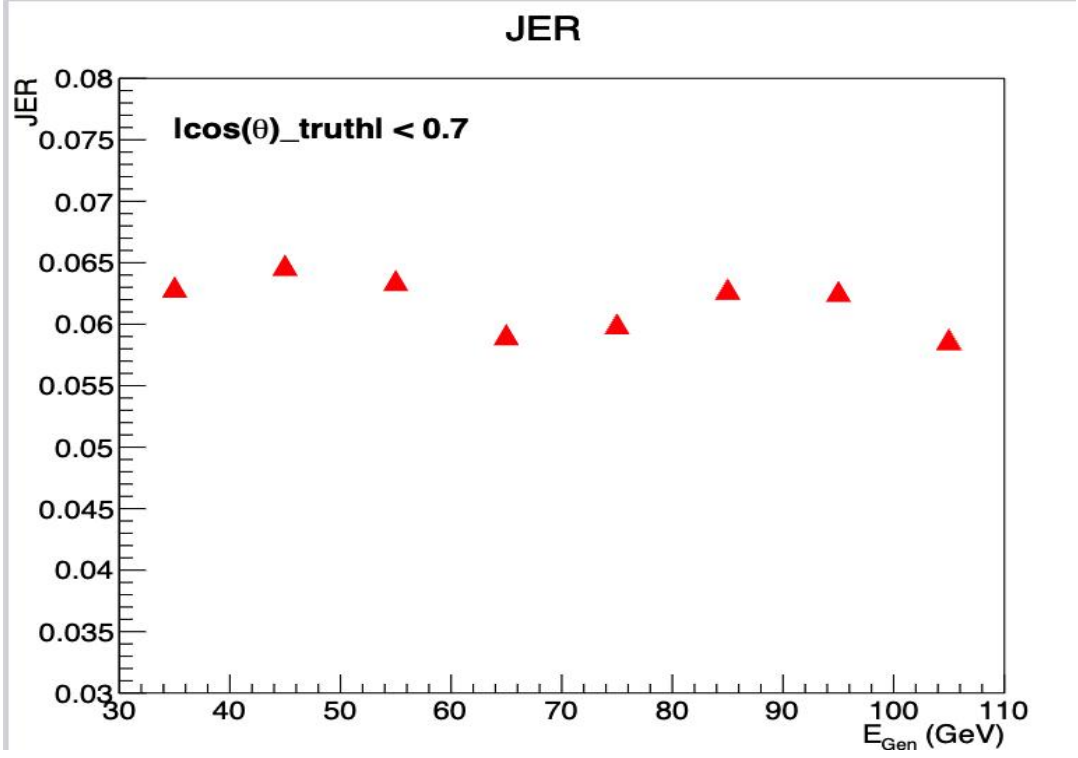

DSCB Fit
E_DSCB_fit_E_45~50
Mean = 0.0443 ± 0.0007
Sigma = 0.0704 ± 0.0008
alphaLo = 1.3830 ± 0.0405
nLo = 12.2259 ± 2.6833
alphaHi = 1.3079 ± 0.0395
nHi = 6.4440 ± 0.8626
Events / (0.02)
JER

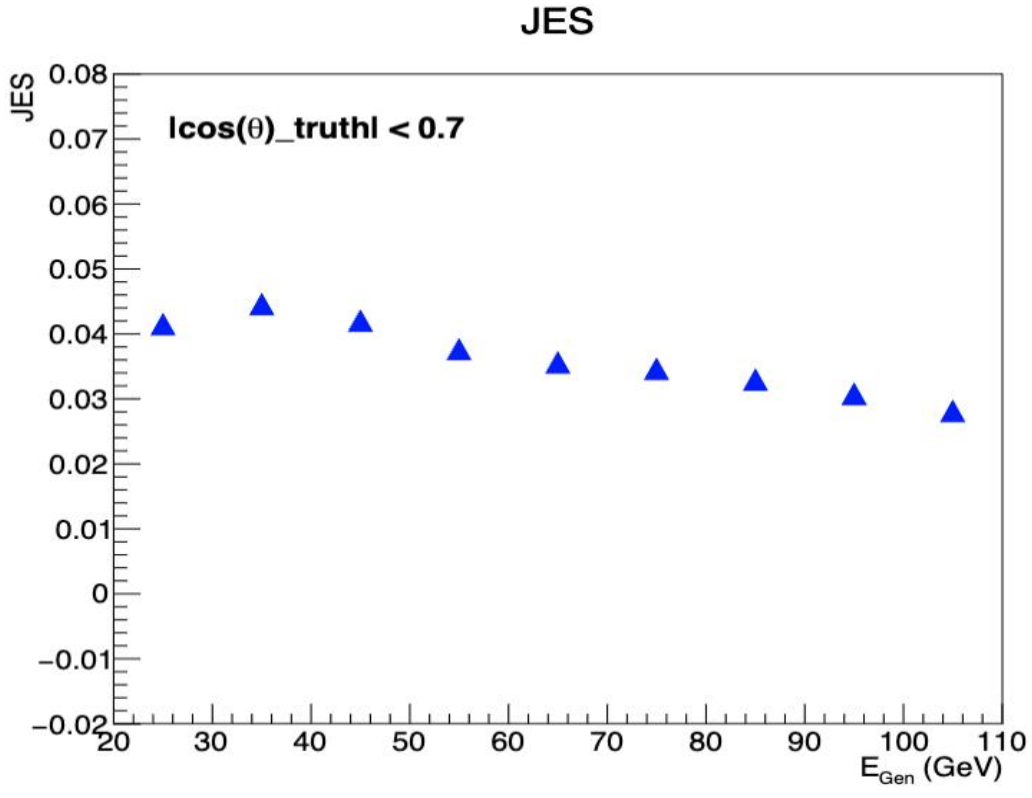

JER
|cos(θ)_truth| < 0.7
JER
E_Gen (GeV)


JES
|cos(θ)_truth| < 0.7
JES
E_Gen (GeV)

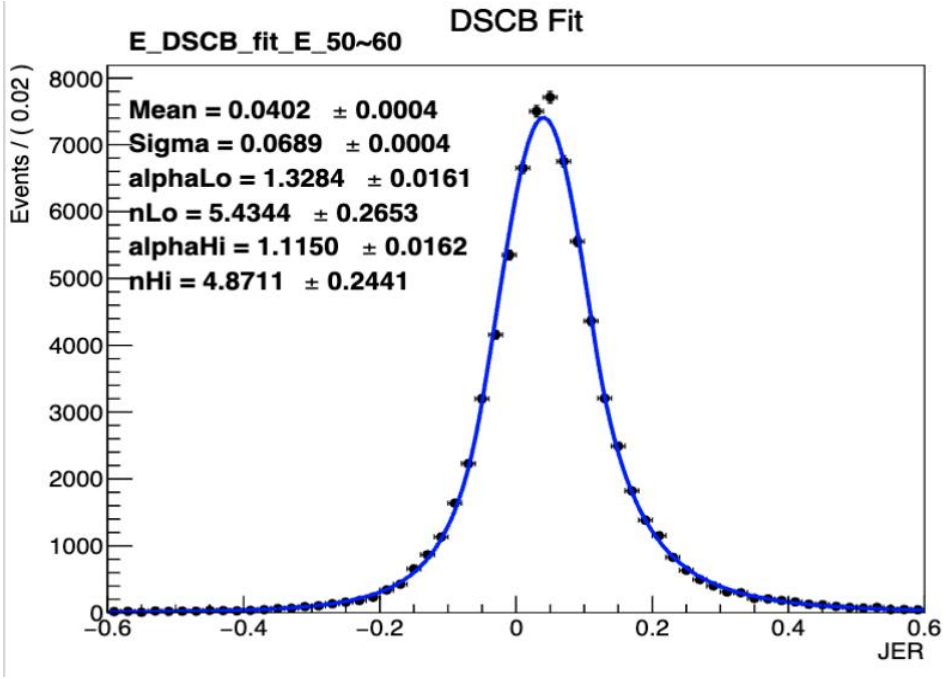
vvHbb

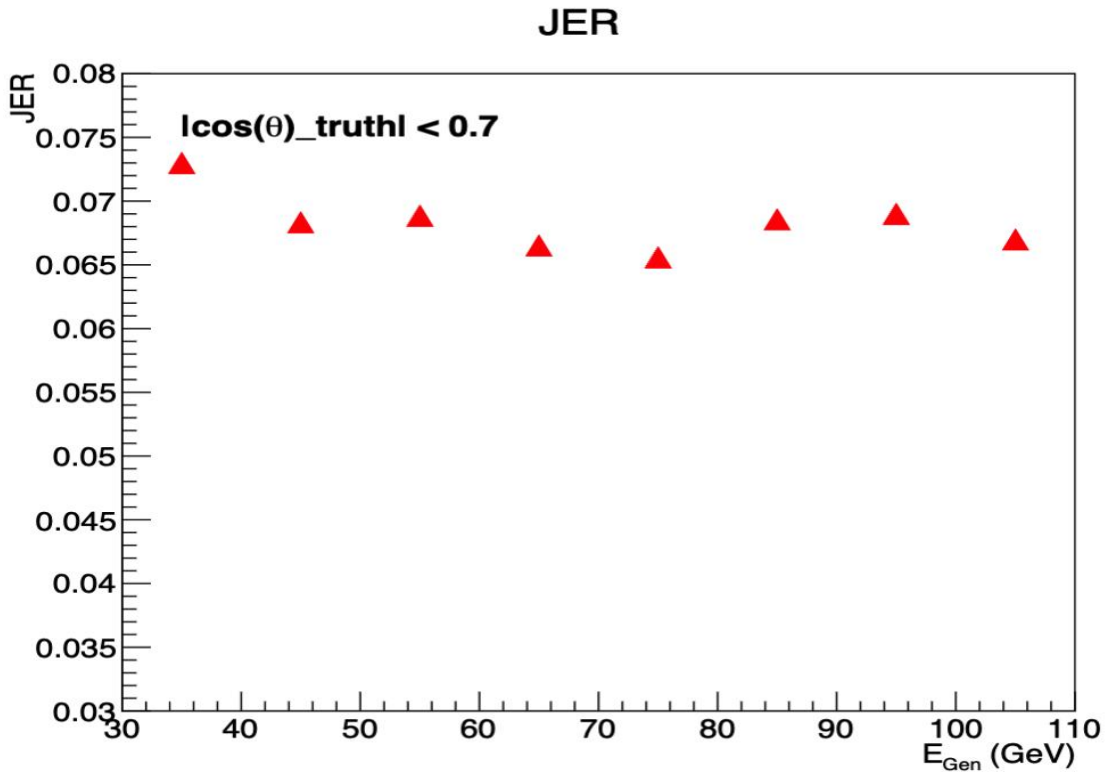

DSCB Fit
E_DSCB_fit_E_30~40
Mean = 0.0446 ± 0.0006
Sigma = 0.0649 ± 0.0007
alphaLo = 1.2404 ± 0.0345
nLo = 23.2213 ± 7.7850
alphaHi = 1.0372 ± 0.0238
nHi = 5.1348 ± 0.4323
Events / (0.02)
JER

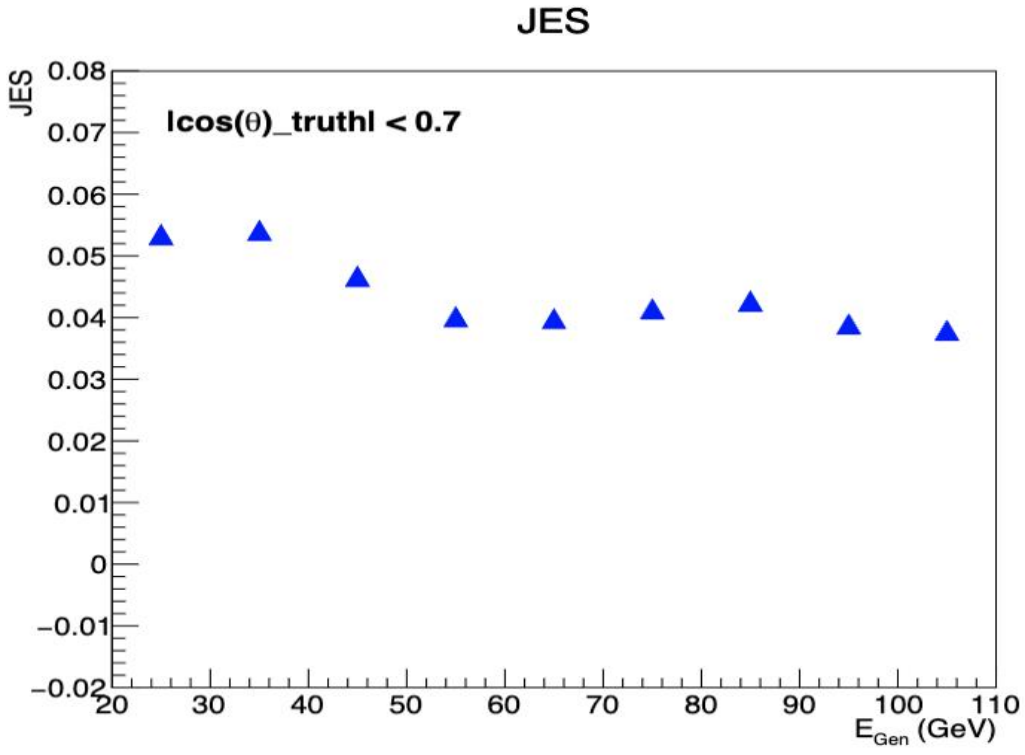

JER
|cos(θ)_truth| < 0.7
JER
E_Gen (GeV)


JES
|cos(θ)_truth| < 0.7
JES
E_Gen (GeV)

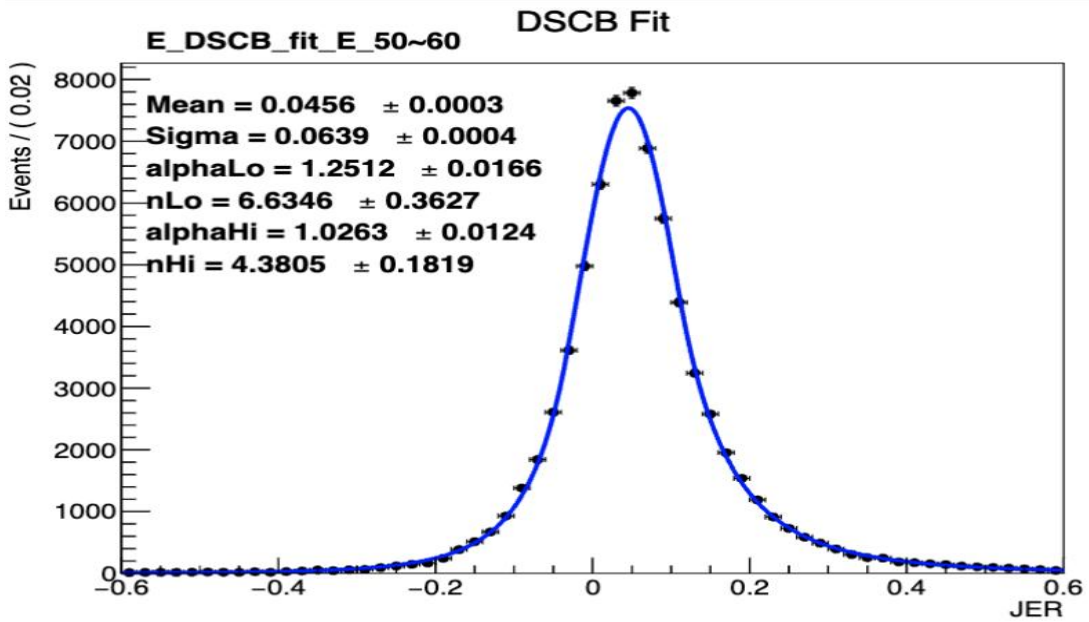
vvHcc

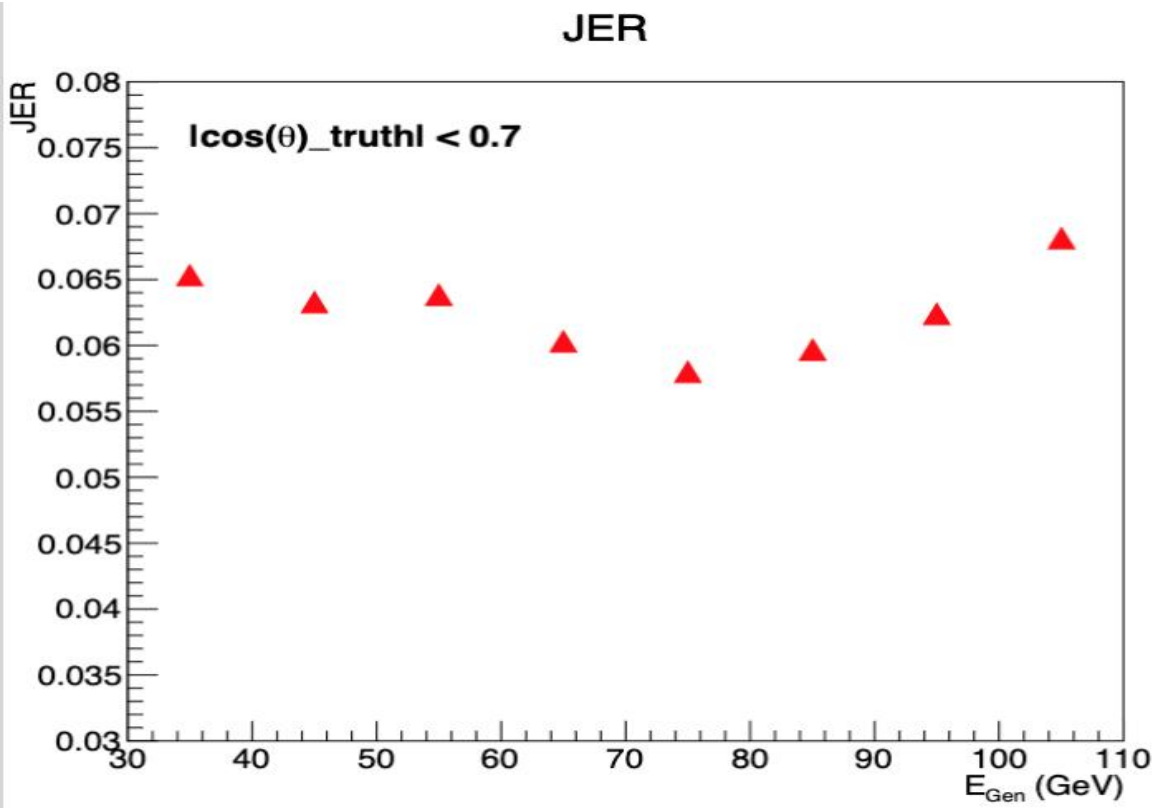

DSCB Fit
E_DSCB_fit_E_50~60
Mean = 0.0402 ± 0.0004
Sigma = 0.0689 ± 0.0004
alphaLo = 1.3284 ± 0.0161
nLo = 5.4344 ± 0.2653
alphaHi = 1.1150 ± 0.0162
nHi = 4.8711 ± 0.2441
Events / (0.02)
JER

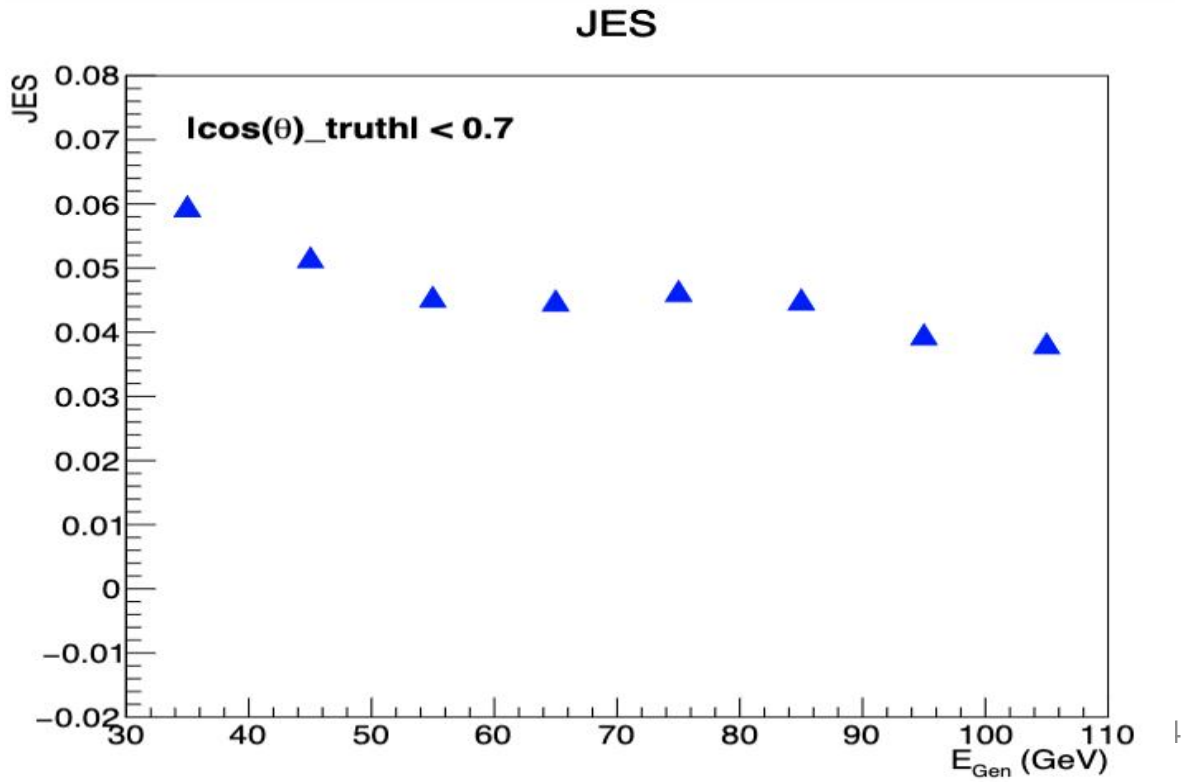

JER
|cos(θ)_truth| < 0.7
JER
E_Gen (GeV)


JES
|cos(θ)_truth| < 0.7
JES
E_Gen (GeV)

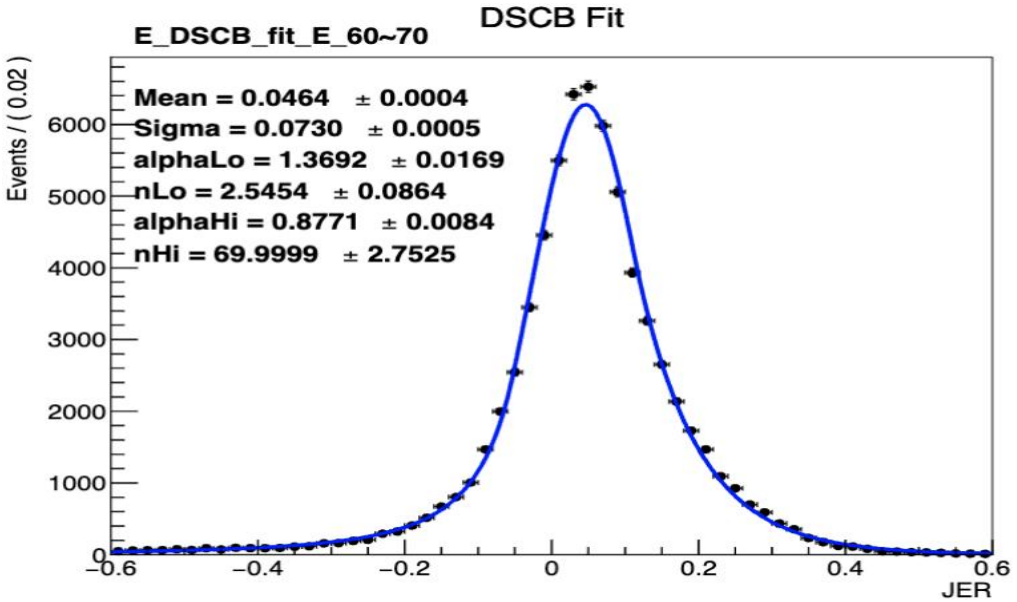
vvHdd

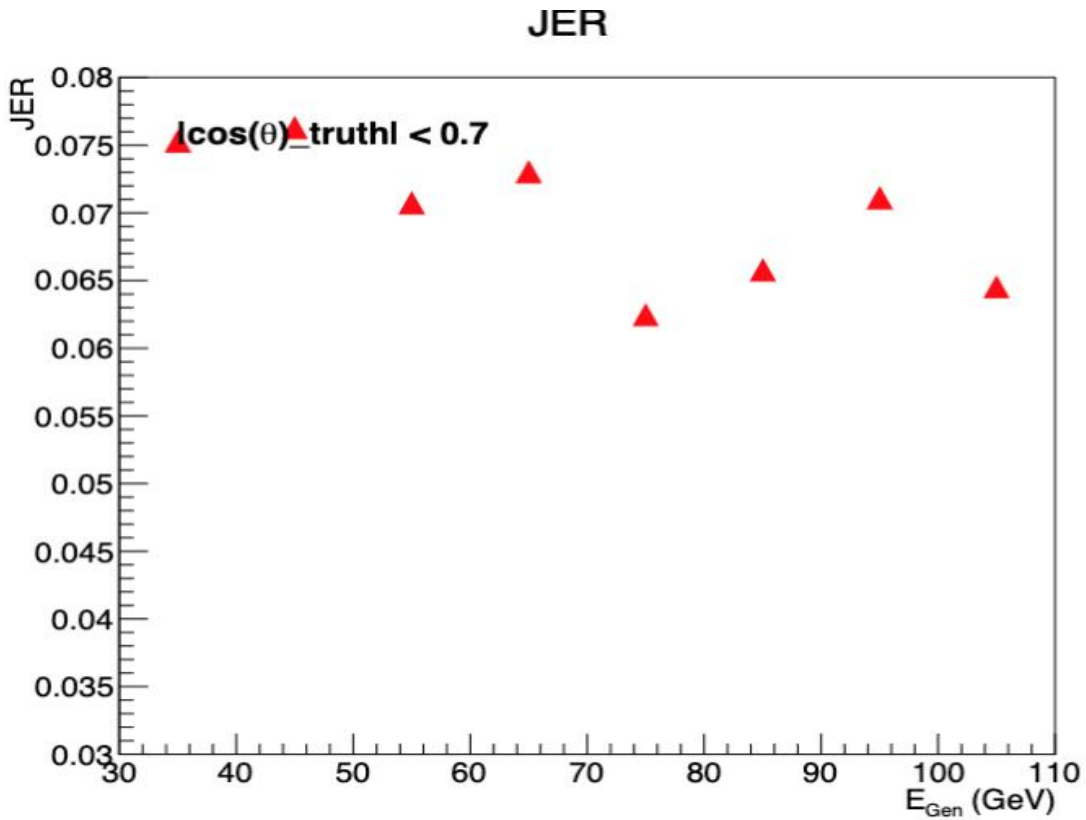

DSCB Fit
E_DSCB_fit_E_50~60
Mean = 0.0456 ± 0.0003
Sigma = 0.0639 ± 0.0004
alphaLo = 1.2512 ± 0.0166
nLo = 6.6346 ± 0.3627
alphaHi = 1.0263 ± 0.0124
nHi = 4.3805 ± 0.1819
Events / (0.02)
JER

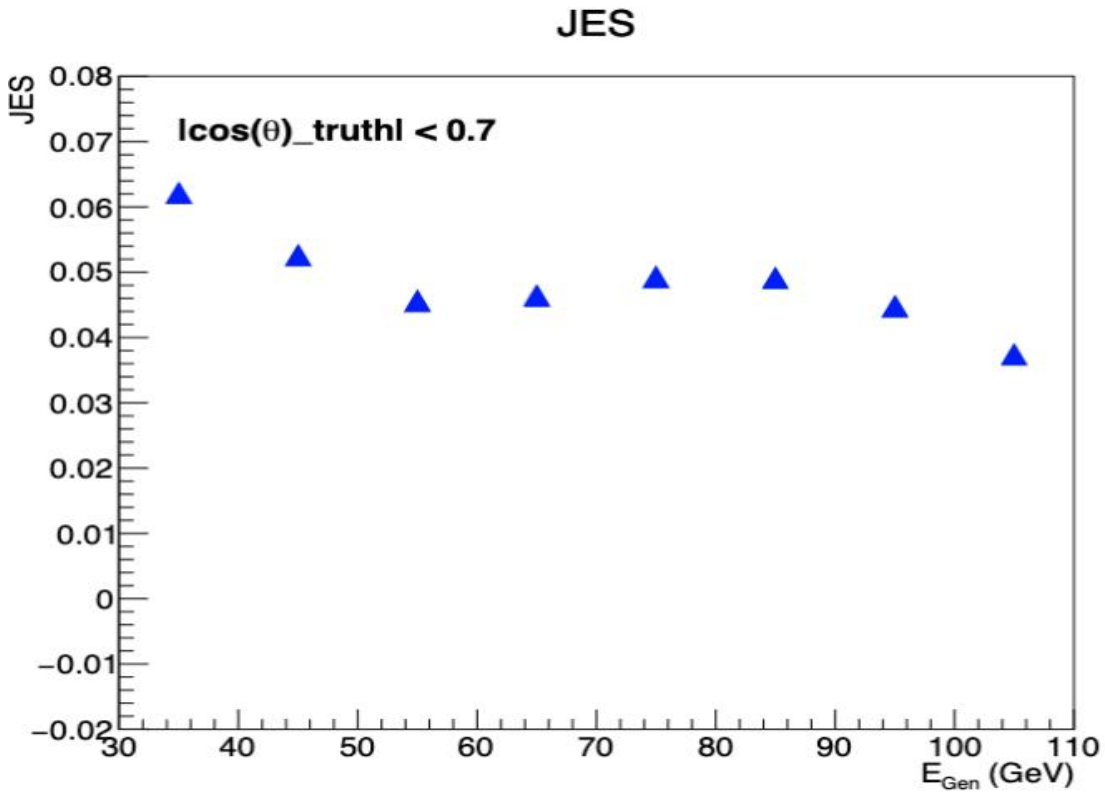

JER
|cos(θ)_truth| < 0.7
JER
E_Gen (GeV)


JES
|cos(θ)_truth| < 0.7
JES
E_Gen (GeV)

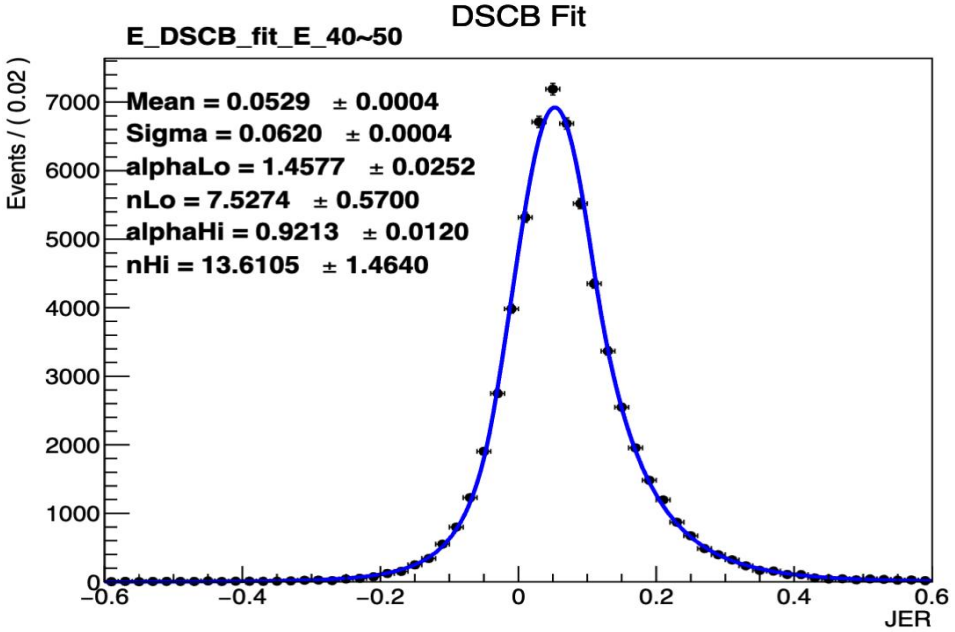
vvHss

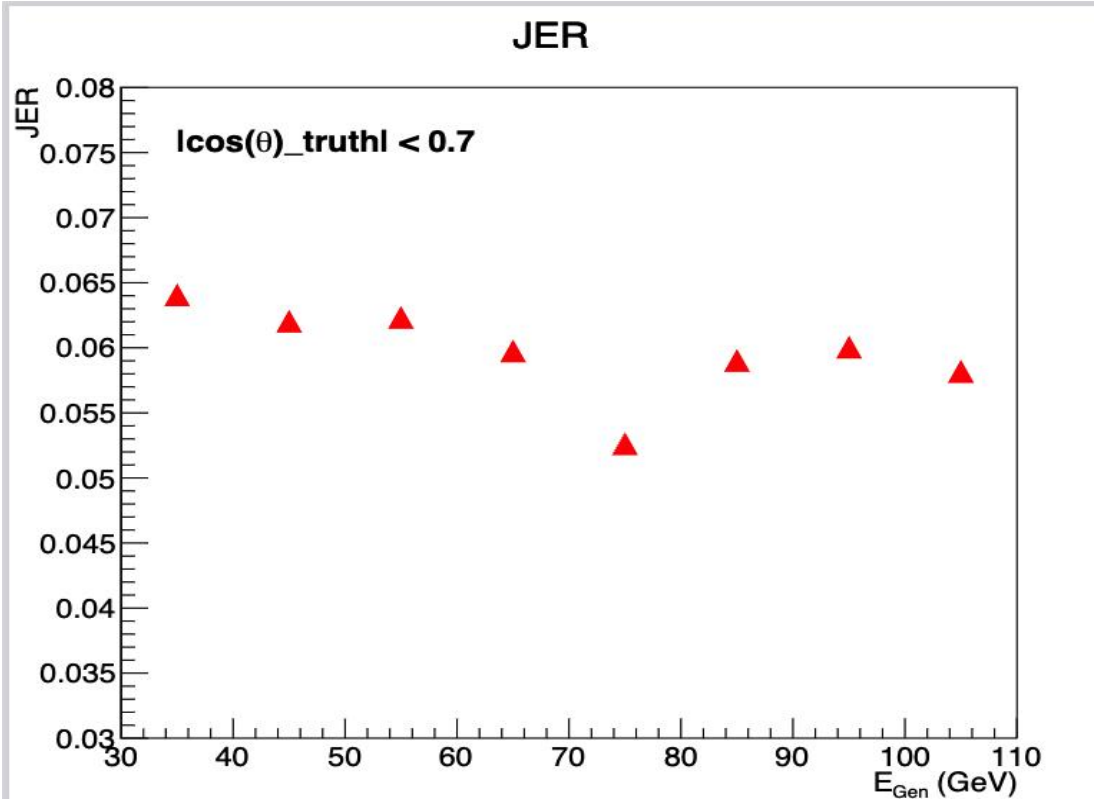

DSCB Fit
E_DSCB_fit_E_60~70
Mean = 0.0464 ± 0.0004
Sigma = 0.0730 ± 0.0005
alphaLo = 1.3692 ± 0.0169
nLo = 2.5454 ± 0.0864
alphaHi = 0.8771 ± 0.0084
nHi = 69.9999 ± 2.7525
Events / (0.02)
JER

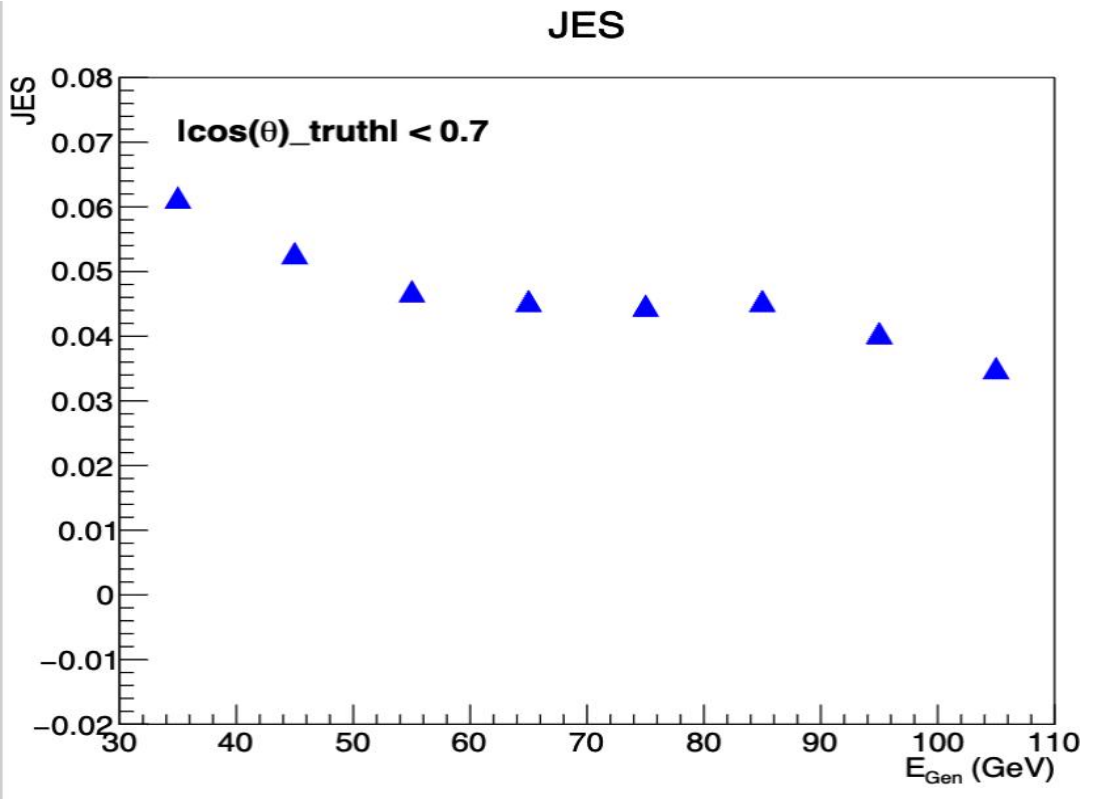

JER
|cos(θ)_truth| < 0.7
JER
E_Gen (GeV)


JES
|cos(θ)_truth| < 0.7
JES
E_Gen (GeV)

vvHuu


DSCB Fit
E_DSCB_fit_E_40~50
Mean = 0.0529 ± 0.0004
Sigma = 0.0620 ± 0.0004
alphaLo = 1.4577 ± 0.0252
nLo = 7.5274 ± 0.5700
alphaHi = 0.9213 ± 0.0120
nHi = 13.6105 ± 1.4640
Events / (0.02)
JER


JER
|cos(θ)_truth| < 0.7
JER
E_Gen (GeV)

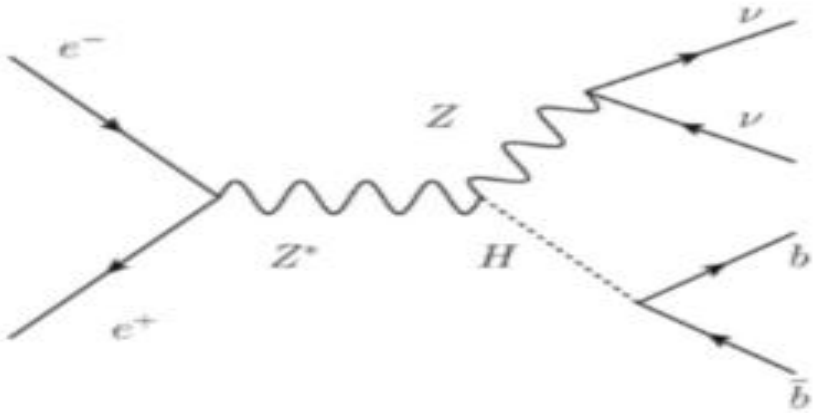

JES
|cos(θ)_truth| < 0.7
JES
E_Gen (GeV)

JER&JAR

Hou Yingqi

2024/11/13

Process



ZH->vvH,H->bb

```
data = getEntries("/cefs/higgs/houyingqi/jet_bbtotal.root", "jets", variables)
```

from Kaili.

```
data_barrel = data[(abs(data["jet1_costheta"]) < 0.70) & (abs(data["jet2_costheta"]) < 0.70)]
```

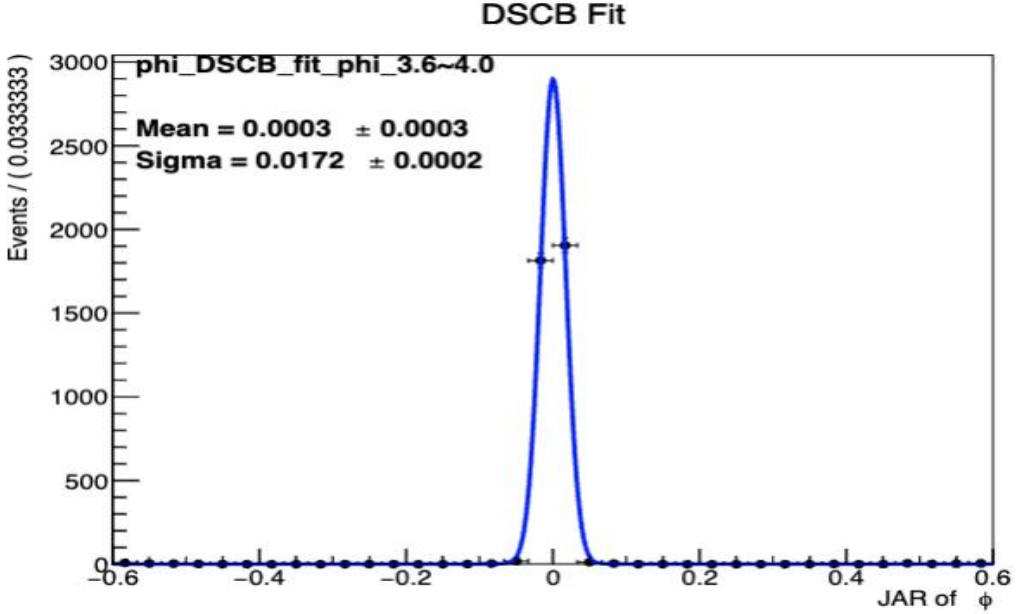
```
Total number of entries in dataAWK: 31486
```

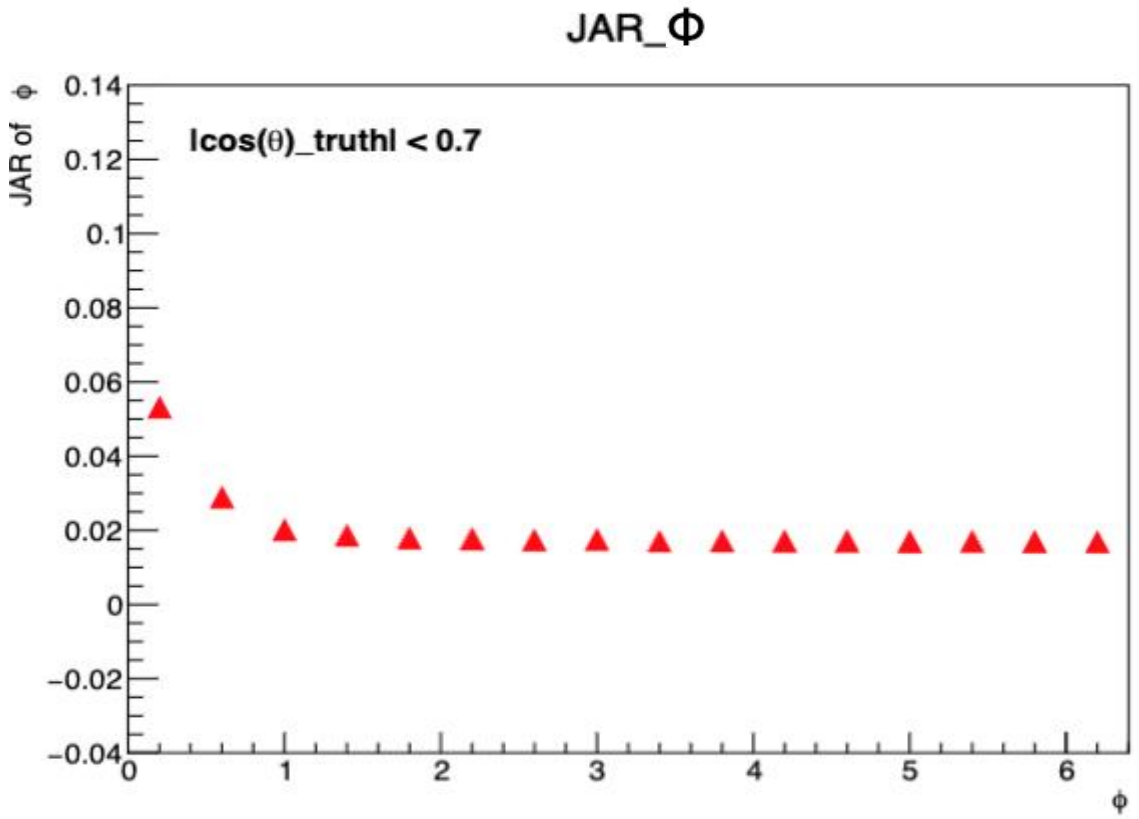
```
Delta_jet = (Reco_jet-Gen_jet)/Gen_jet
```

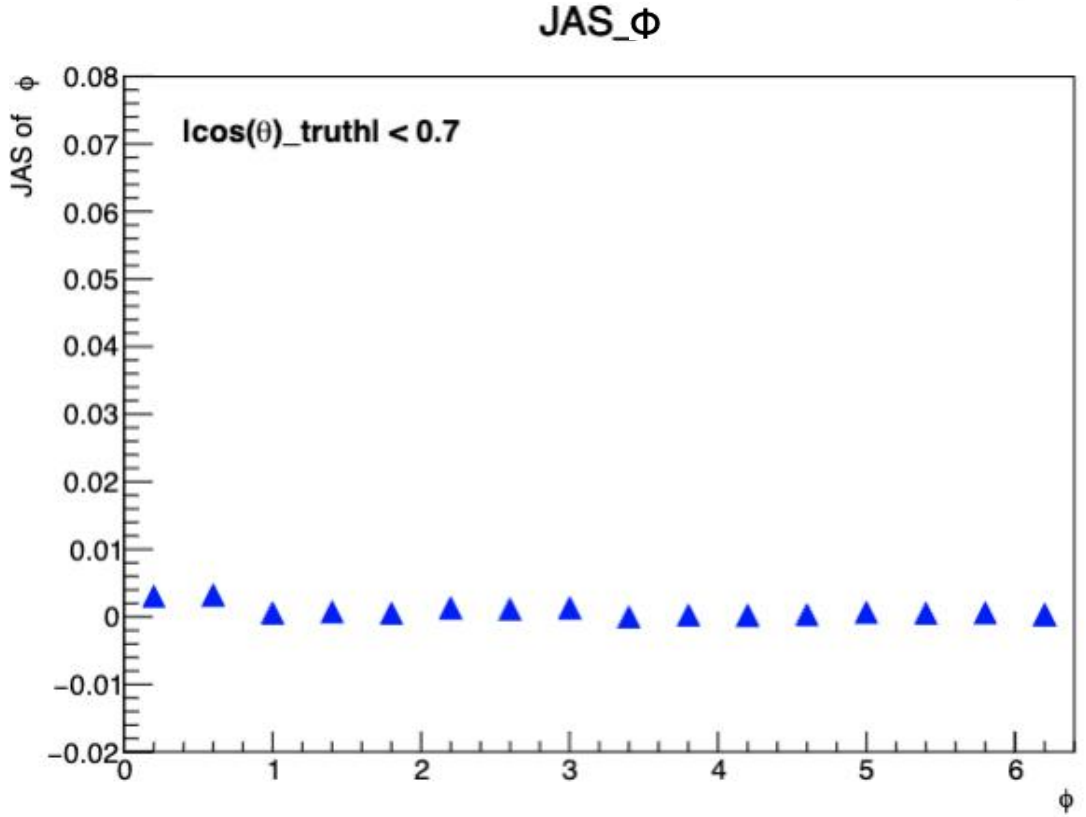
Events above and below the scope limits are included.

```
Jets_bins = [0, 0.4, 0.8, 1.2, 1.6, 2.0, 2.4, 2.8, 3.2, 3.6, 4.0, 4.4, 4.8, 5.2, 5.6, 6.0, 6.4]
```

- ✓ JAR of Φ reaches its maximum at Φ=0.
- ✓ JAS of Φ doesn't change significantly with Φ.

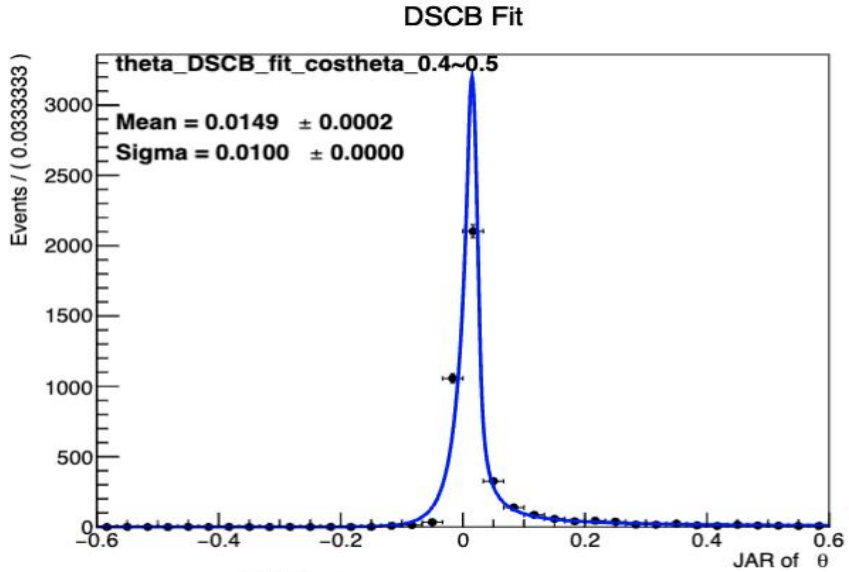


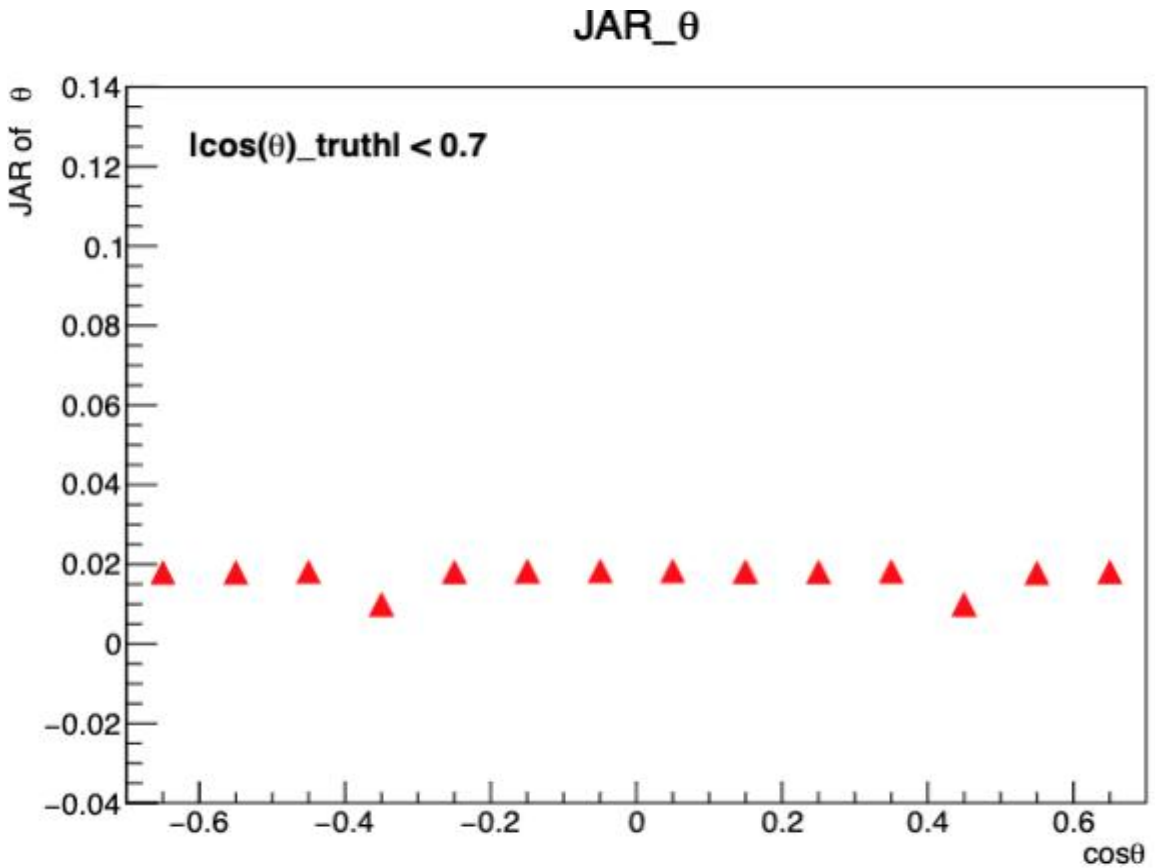


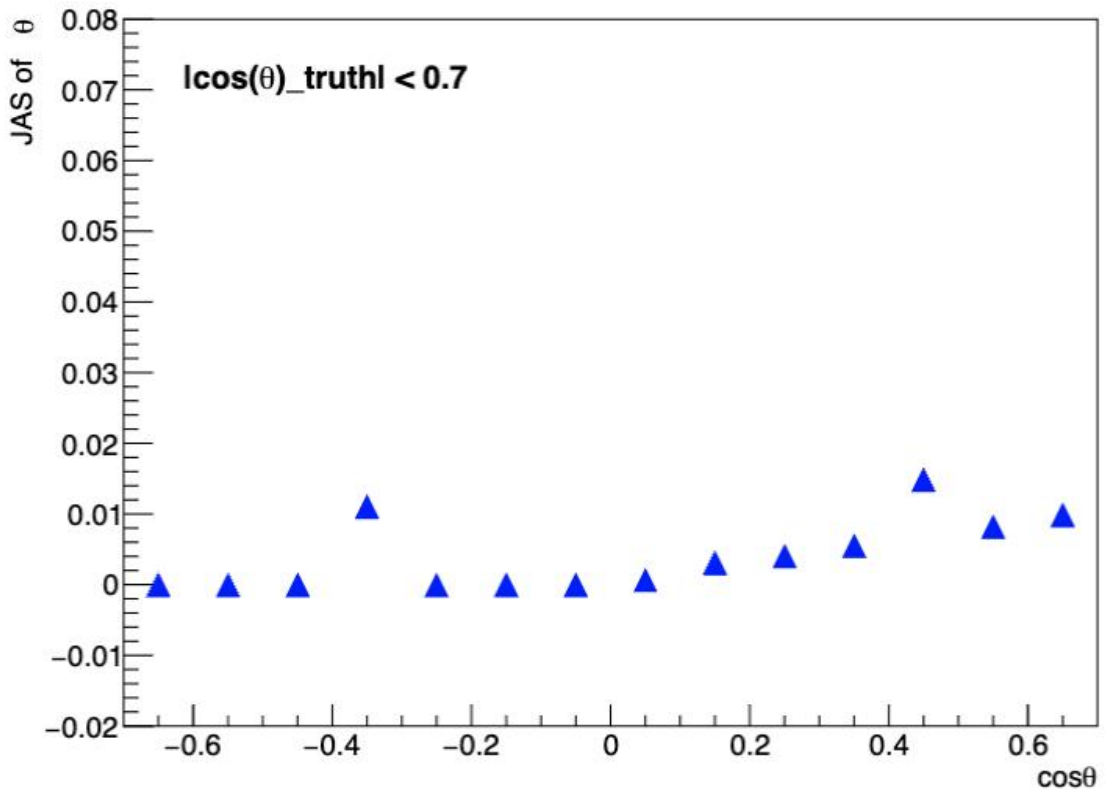


```
Jets_bins = [-0.7, -0.6, -0.5, -0.4, -0.3, -0.2, -0.1, 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7]
```

- ✓ JAR of θ doesn't change significantly with the increase of cosθ.
- ✓ JAS of θ gradually increases as cosθ increases.

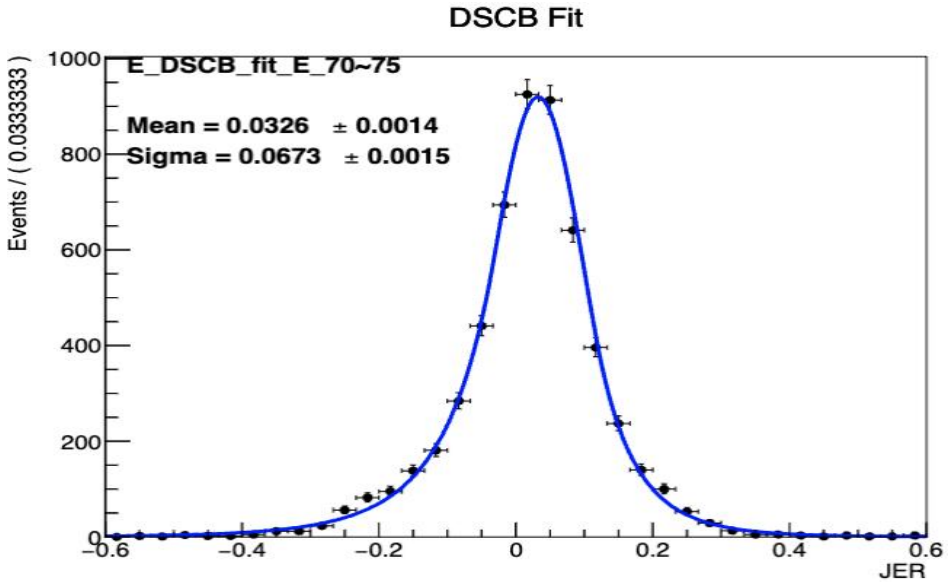


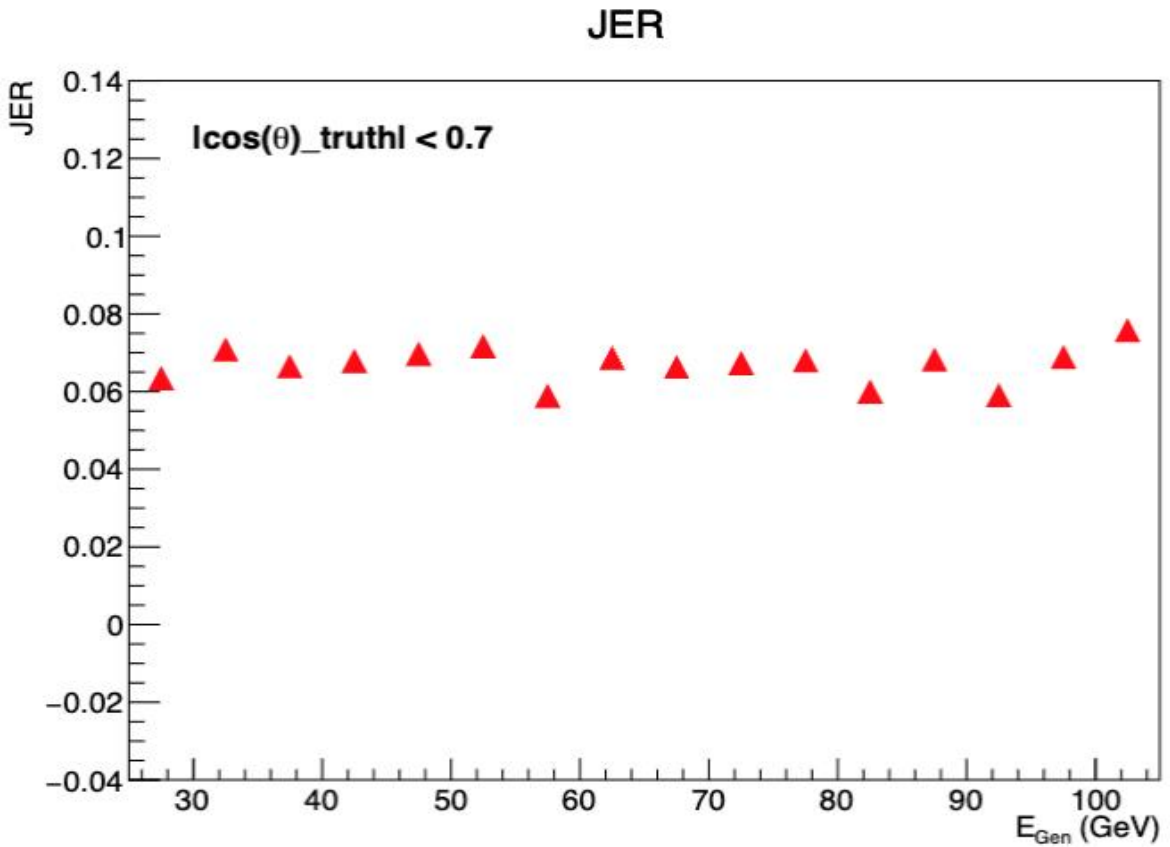


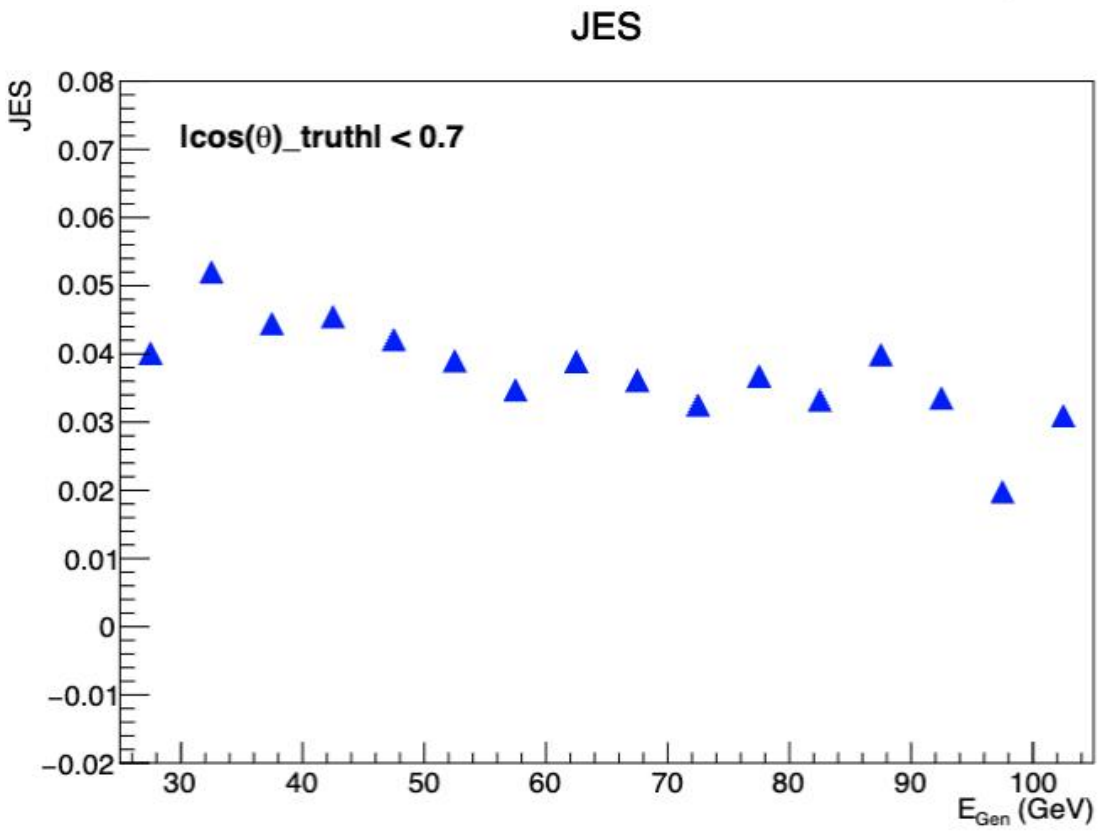


```
Jets_bins = [10, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 120]
```

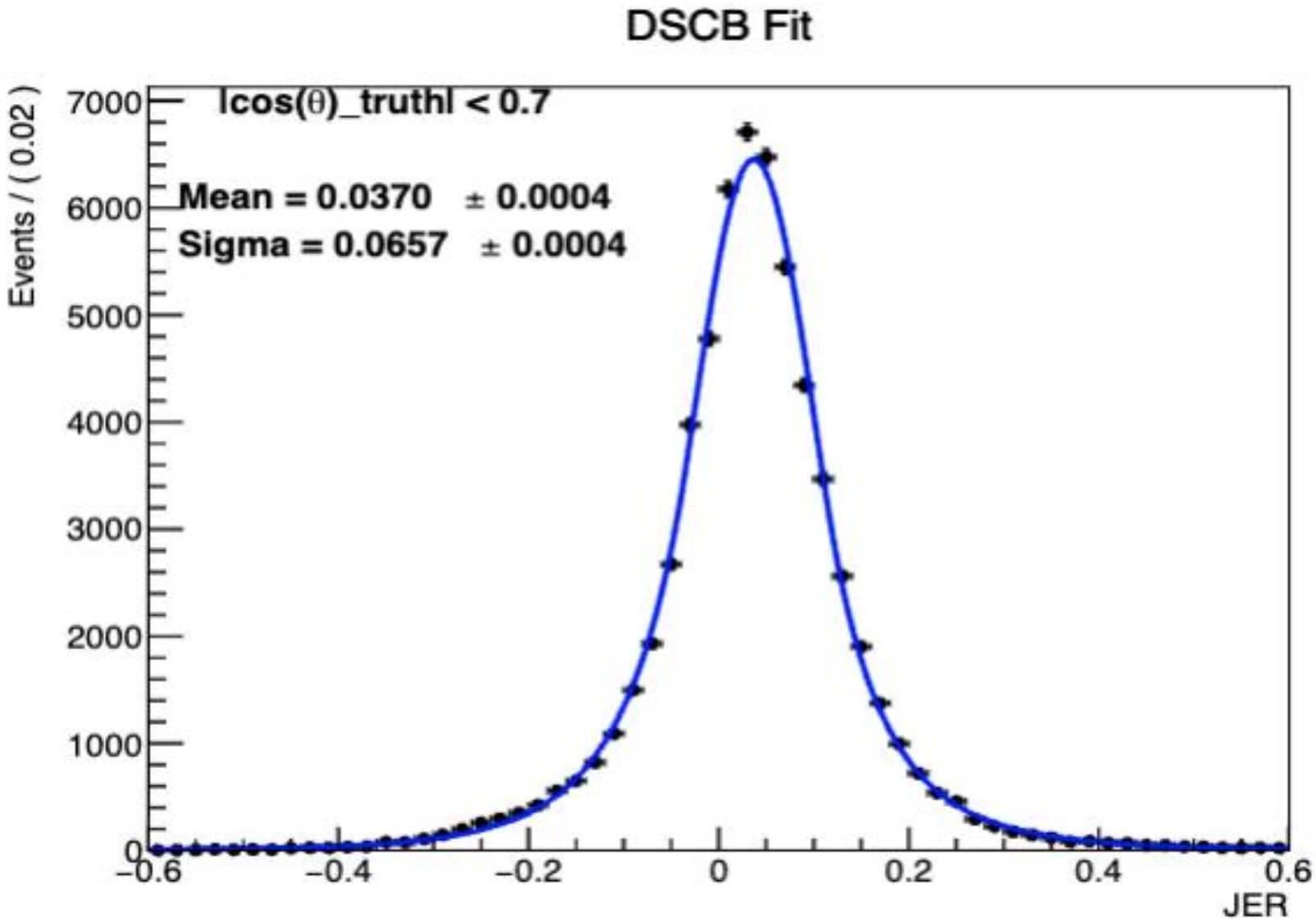
- JER doesn't change significantly with the increase of energy.
- JES gradually decreases as energy increases.



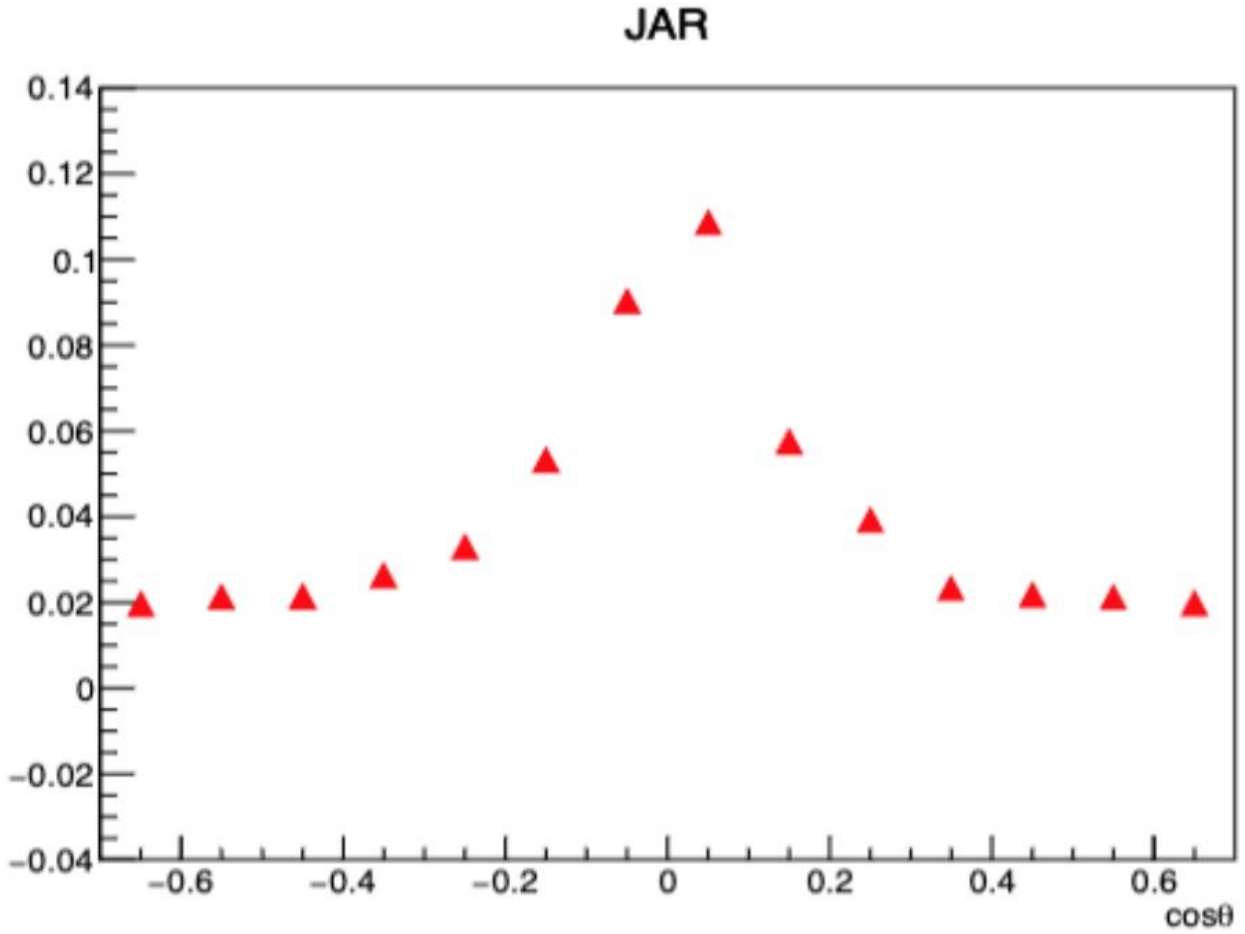




Jet(modification)



Addtionly Find



- Incorrectly treated cosθ as the variable of JAR.
- It has a peak at cosθ=0. Why?

Back Up

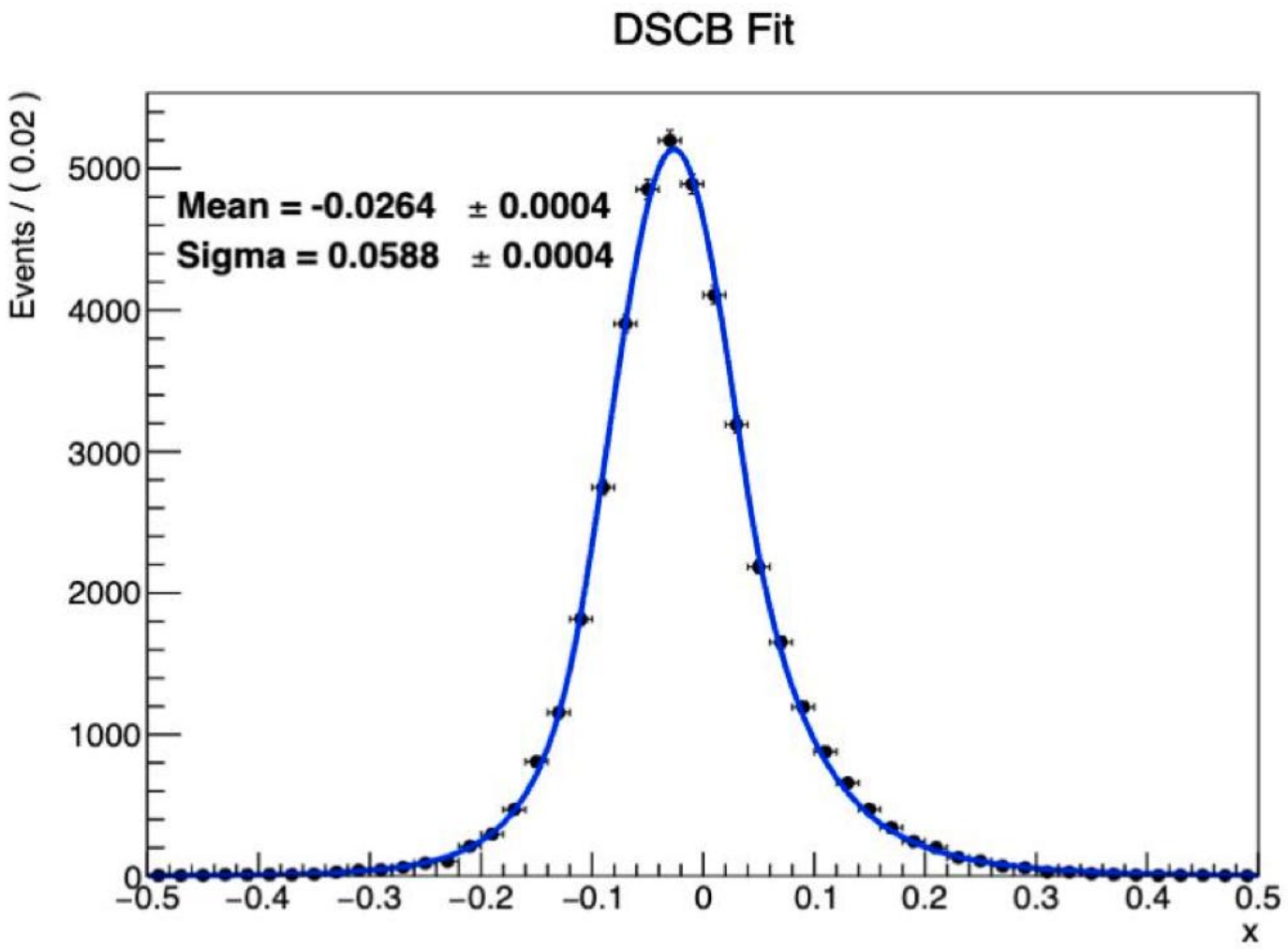
JER

Hou Yingqi

2024/11/06

```
data = getEntries("/cefs/higgs/houyingqi/jet_bbtotal.root", "jets", variables)
```

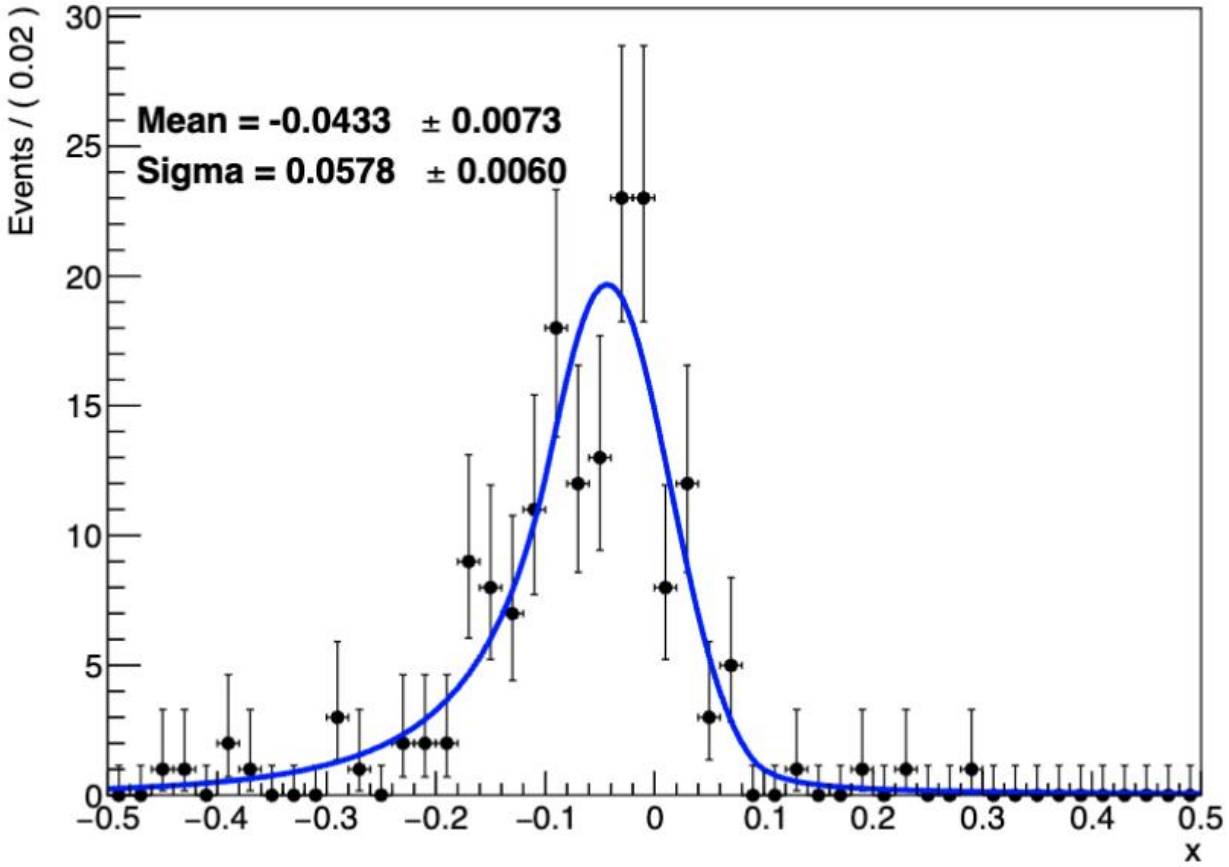
jet1 + jet2(是不区分jet1和jet2)



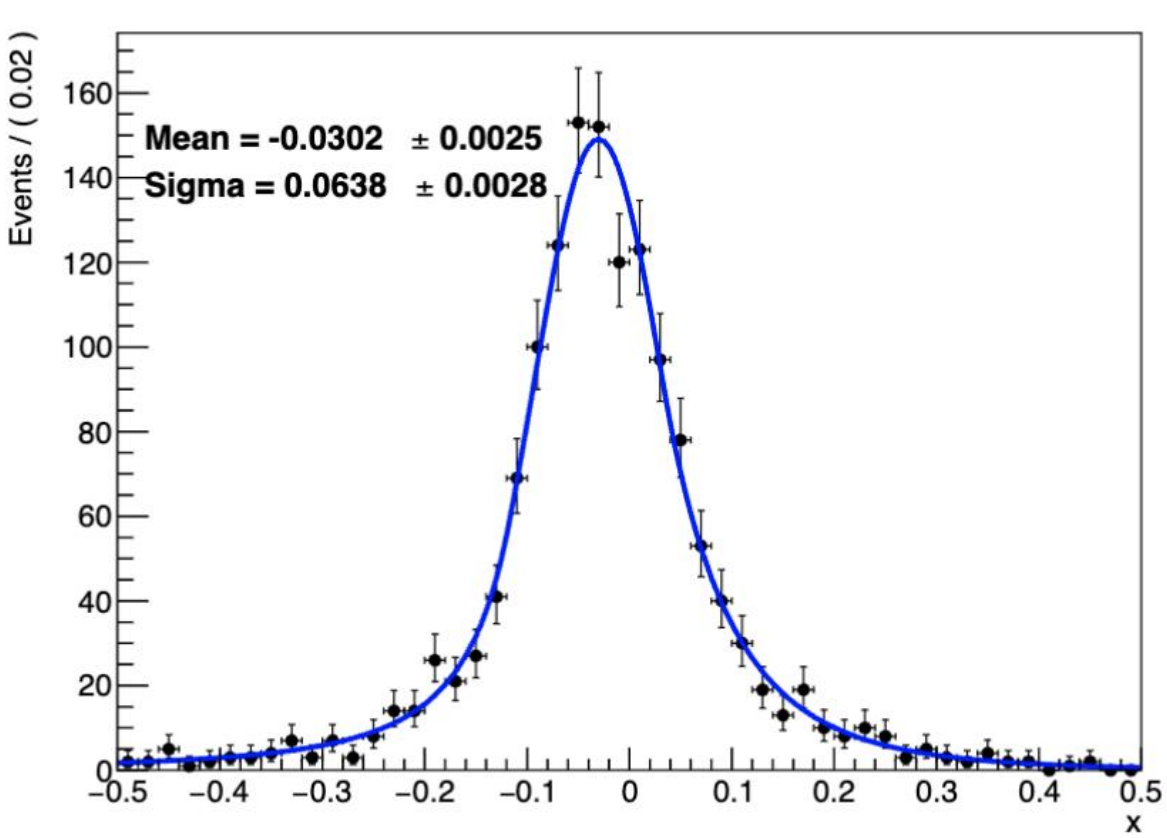

```
Delta_E = (Gen_E - Reco_E)/Gen_E
```

```
data_barrel = data[(abs(data["jet1_costheta"]) < 0.85) & (abs(data["jet2_costheta"]) < 0.85)]
```

Jet1=50GeV(反)

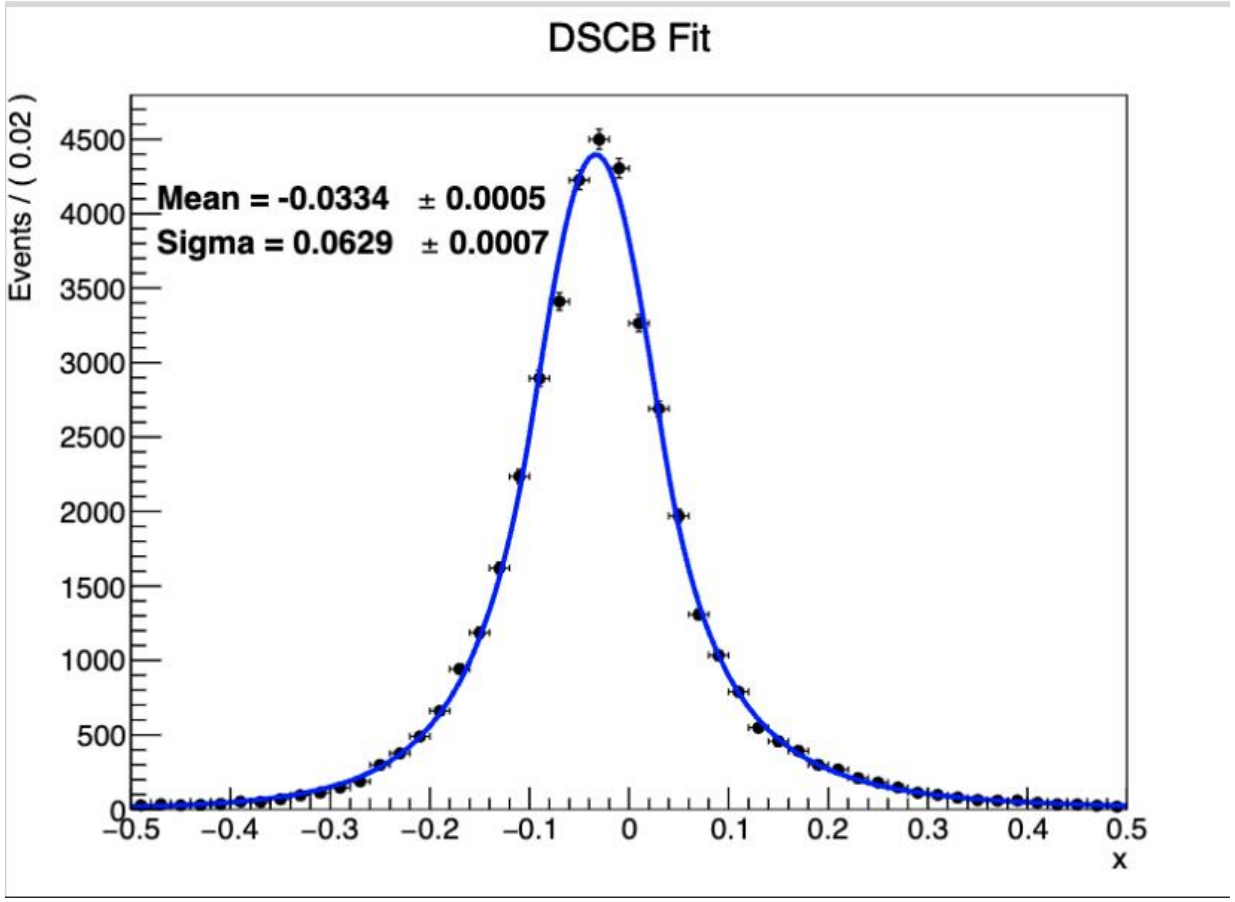


Jet2=50GeV

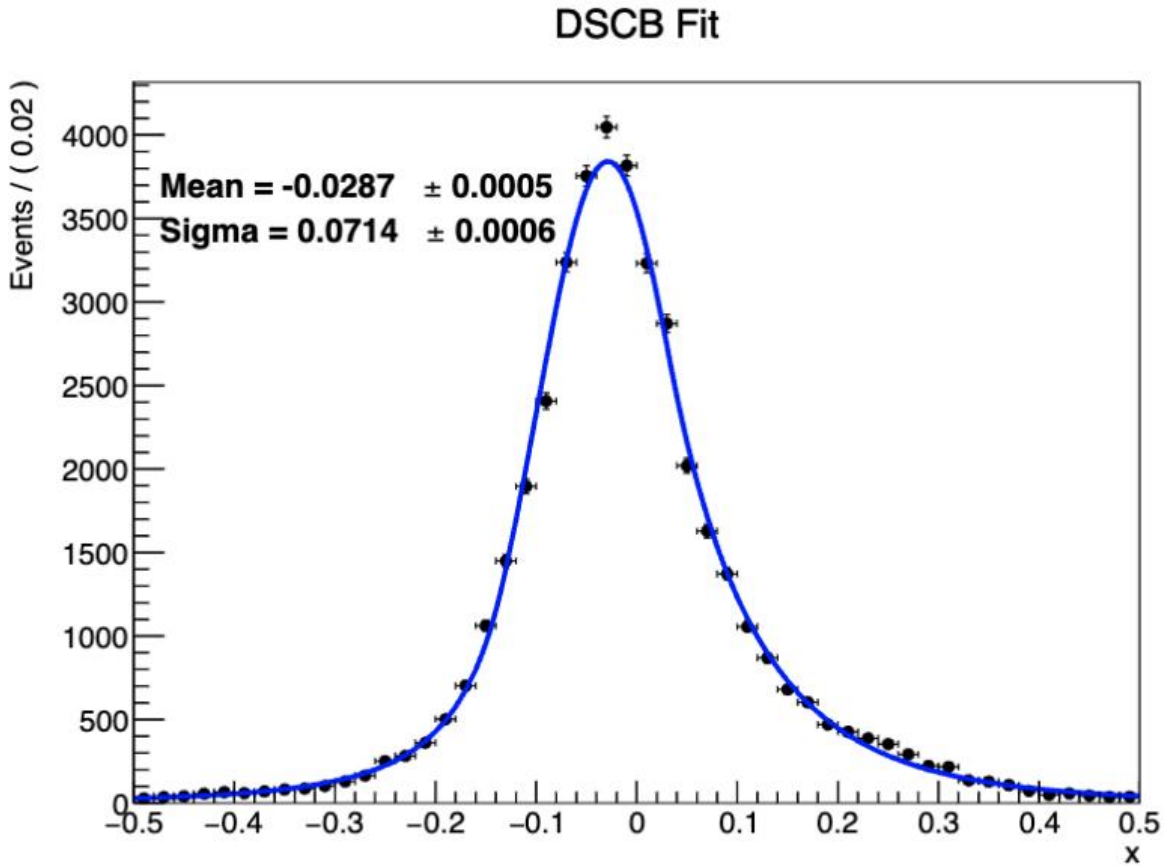


18

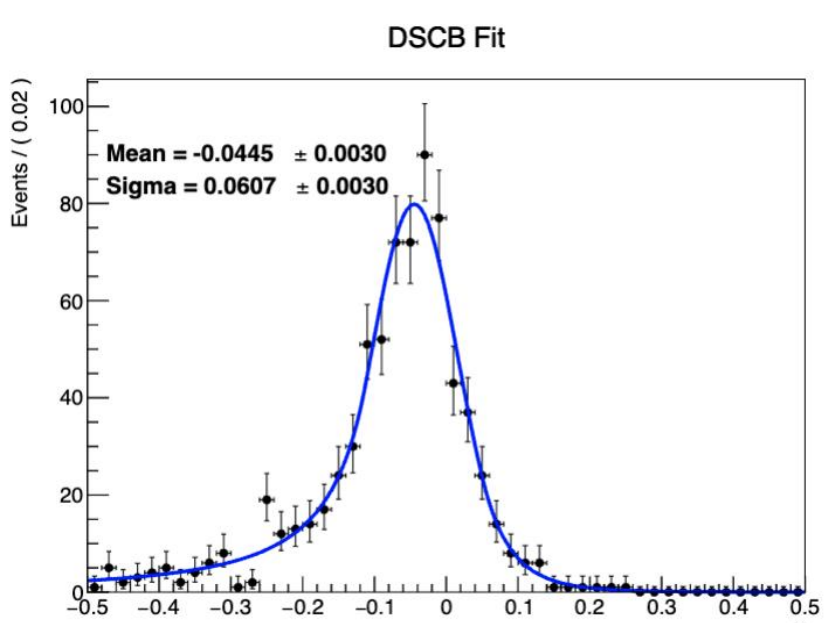
Jet1

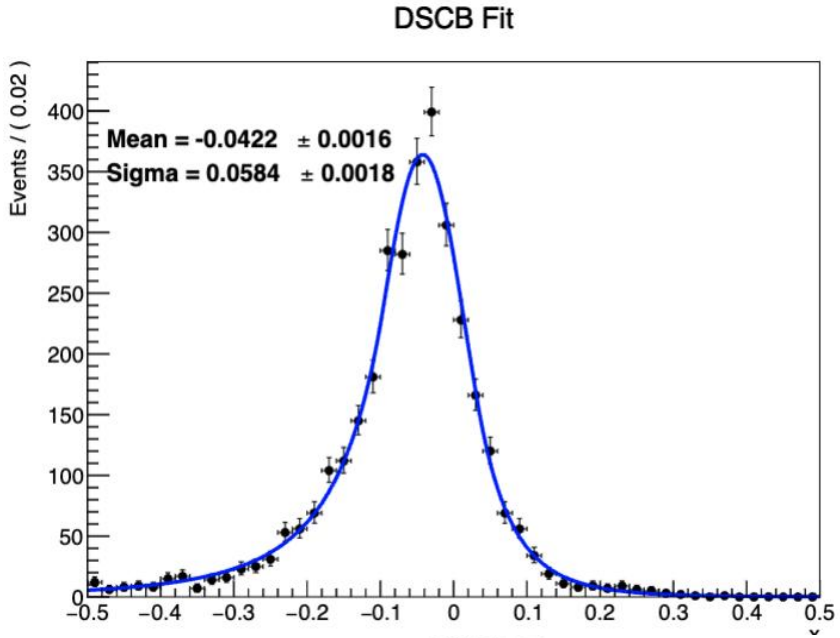

DSCB Fit
Mean = -0.0334 ± 0.0005
Sigma = 0.0629 ± 0.0007
Events / (0.02)
x

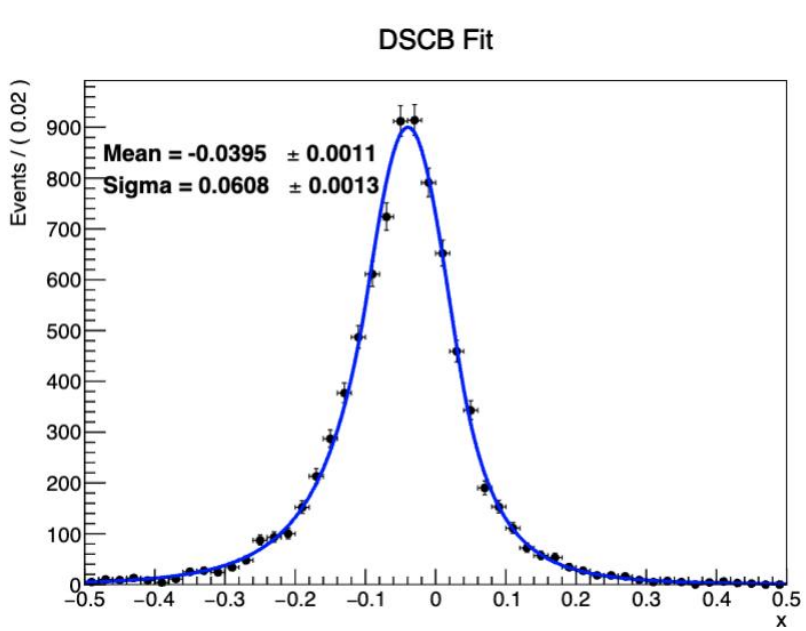
Jet2

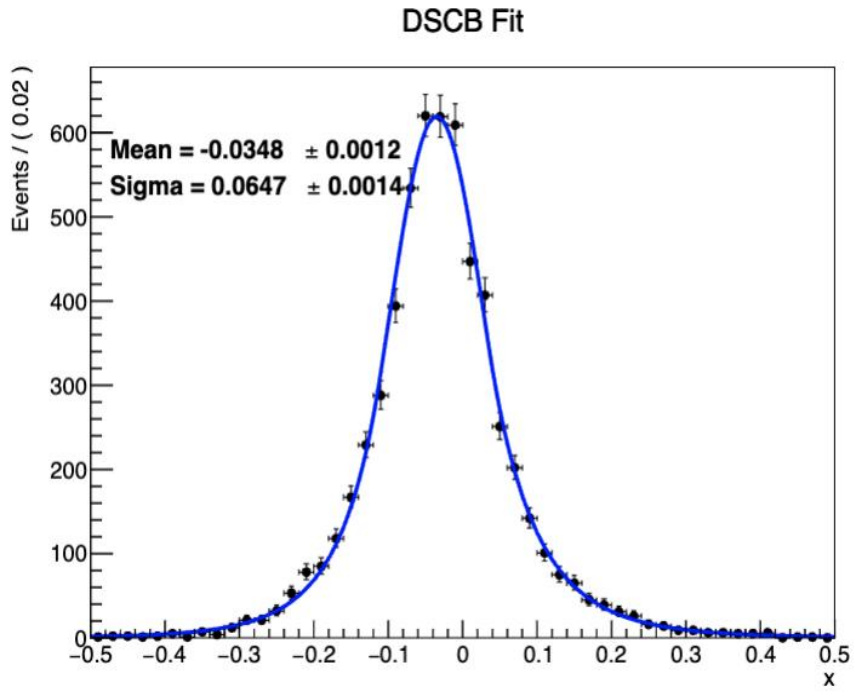

DSCB Fit
Mean = -0.0287 ± 0.0005
Sigma = 0.0714 ± 0.0006
Events / (0.02)
x

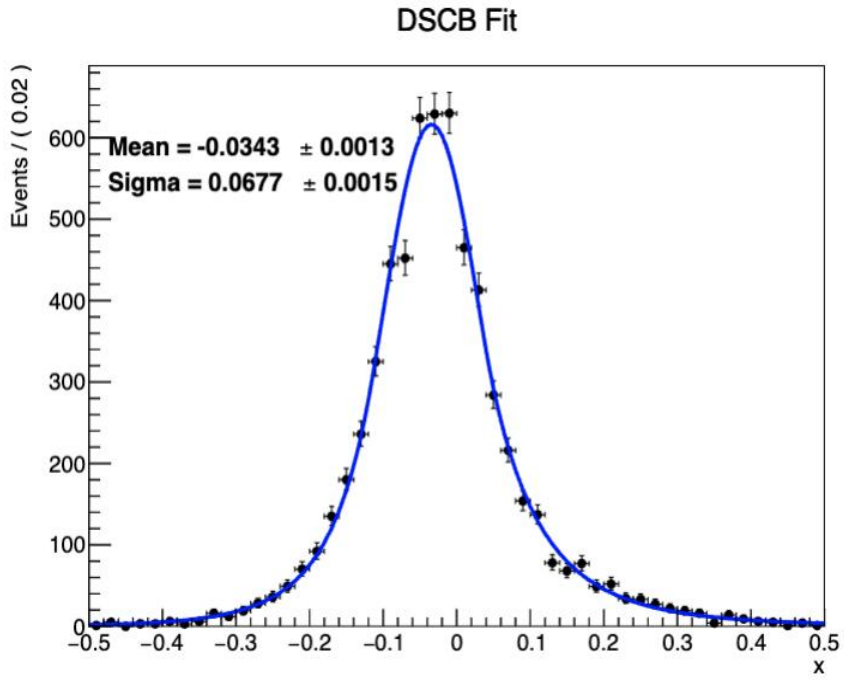
Jet1 `[20,50,60,70,75,80,90,100,110,140]`

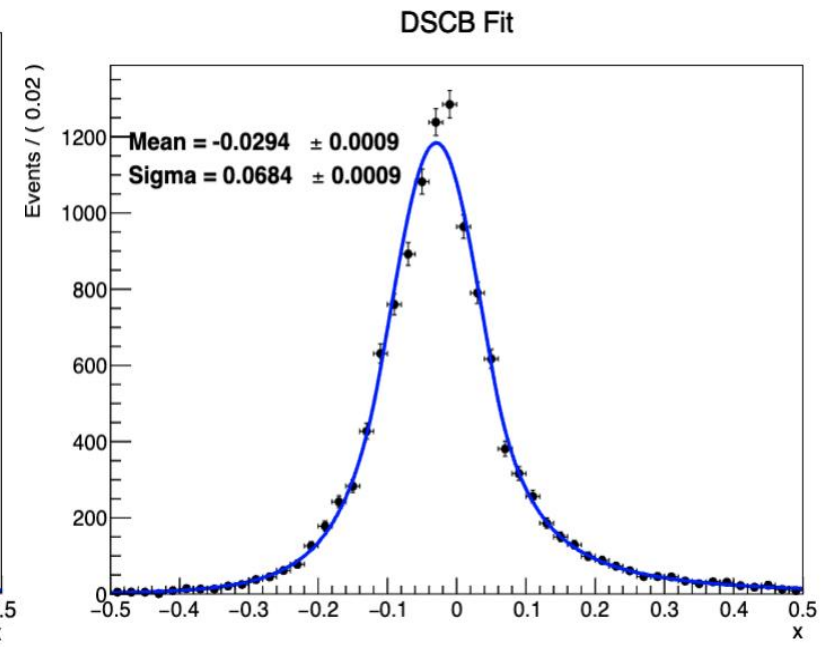


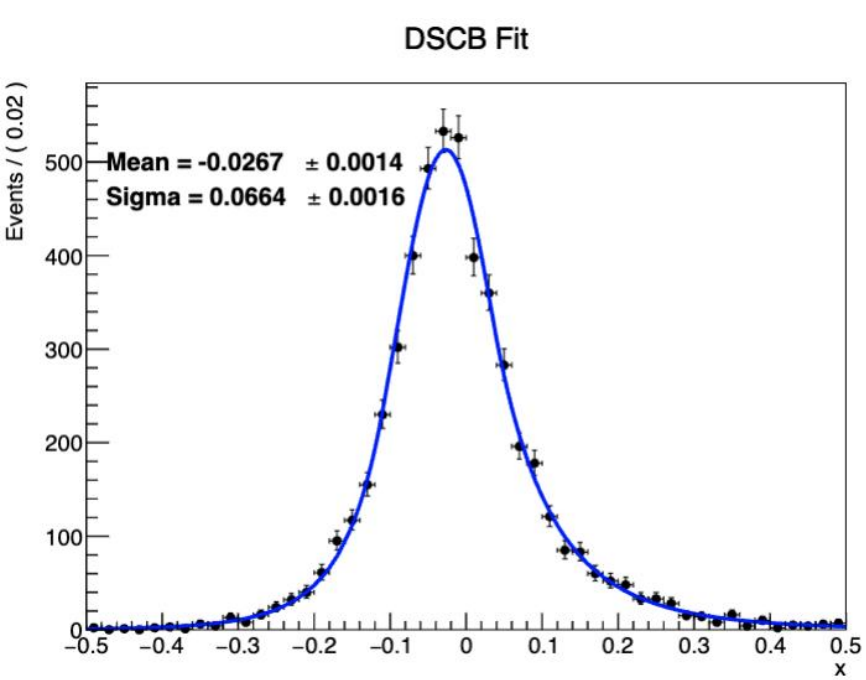


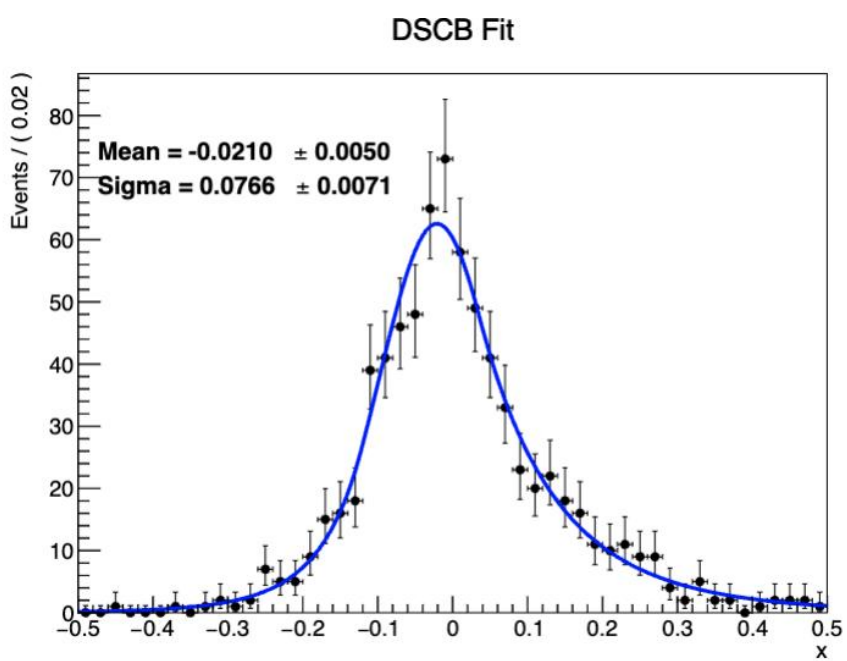


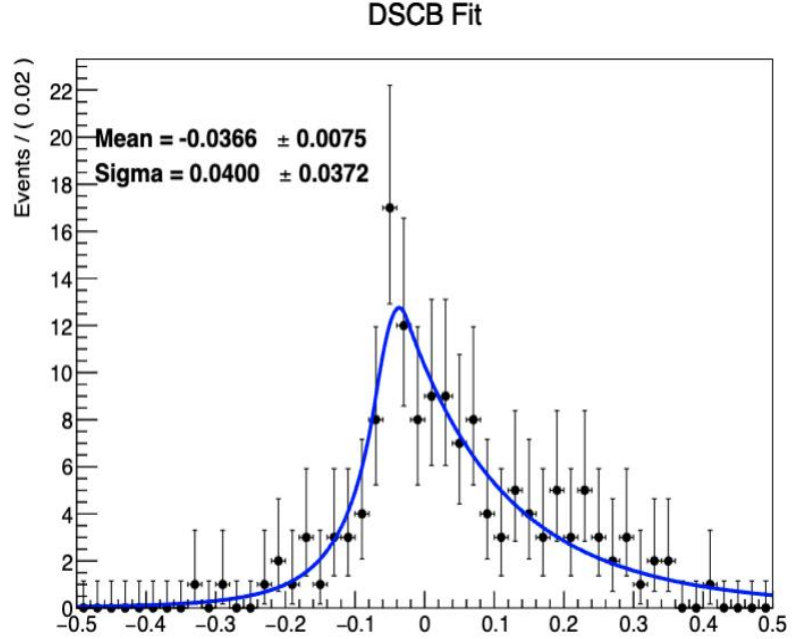




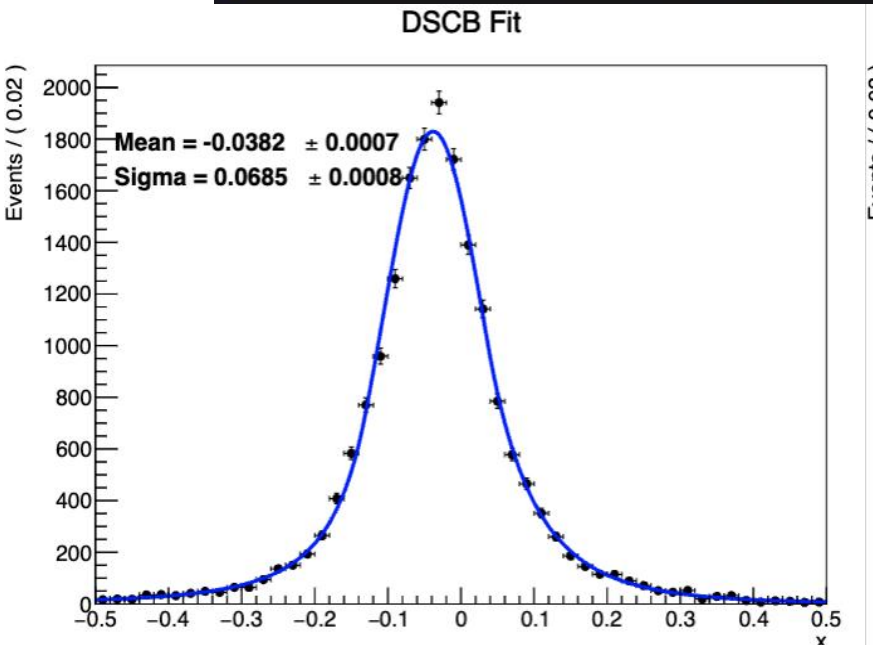


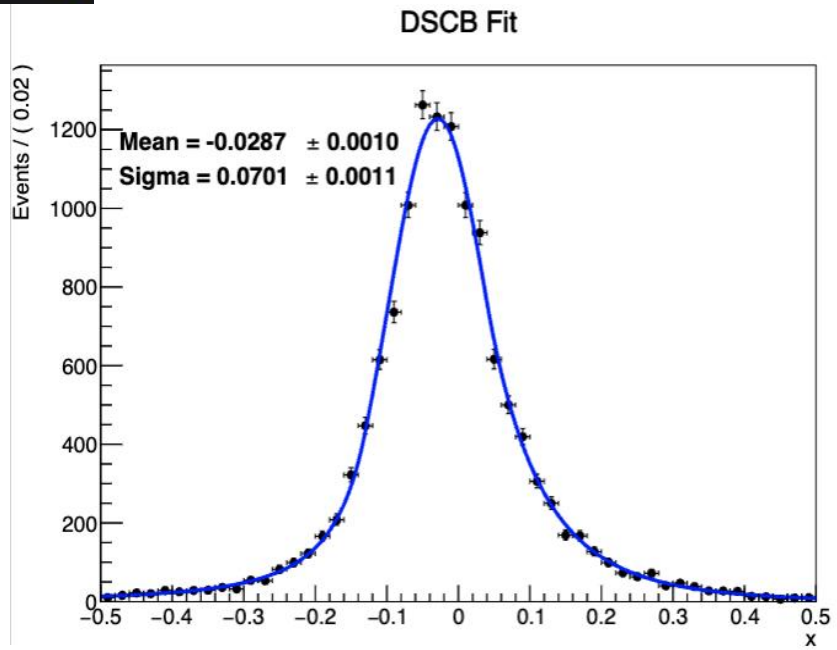

DSCB Fit
Mean = -0.0267 ± 0.0014
Sigma = 0.0664 ± 0.0016
Events / (0.02)
x

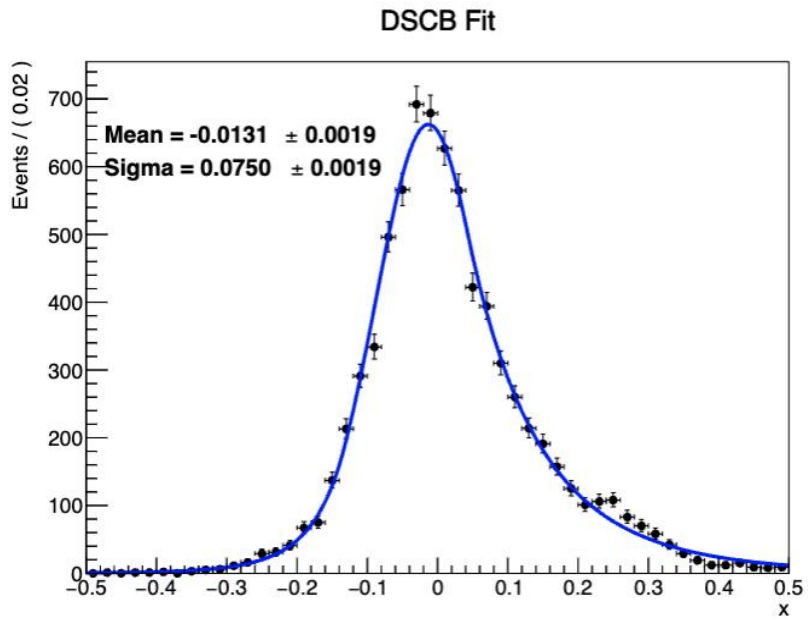

DSCB Fit
Mean = -0.0210 ± 0.0050
Sigma = 0.0766 ± 0.0071
Events / (0.02)
x

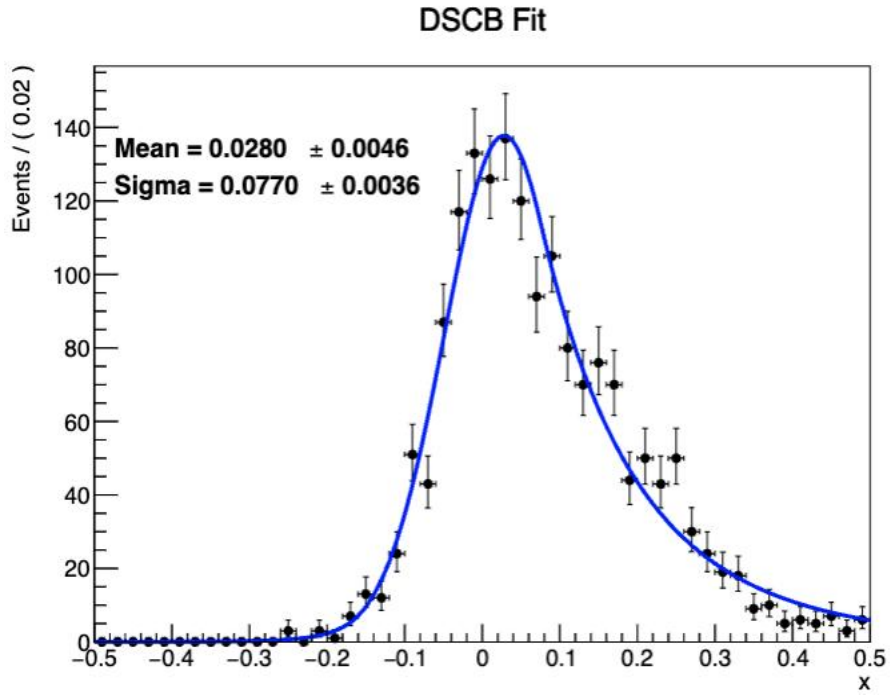

DSCB Fit
Mean = -0.0366 ± 0.0075
Sigma = 0.0400 ± 0.0372
Events / (0.02)
x

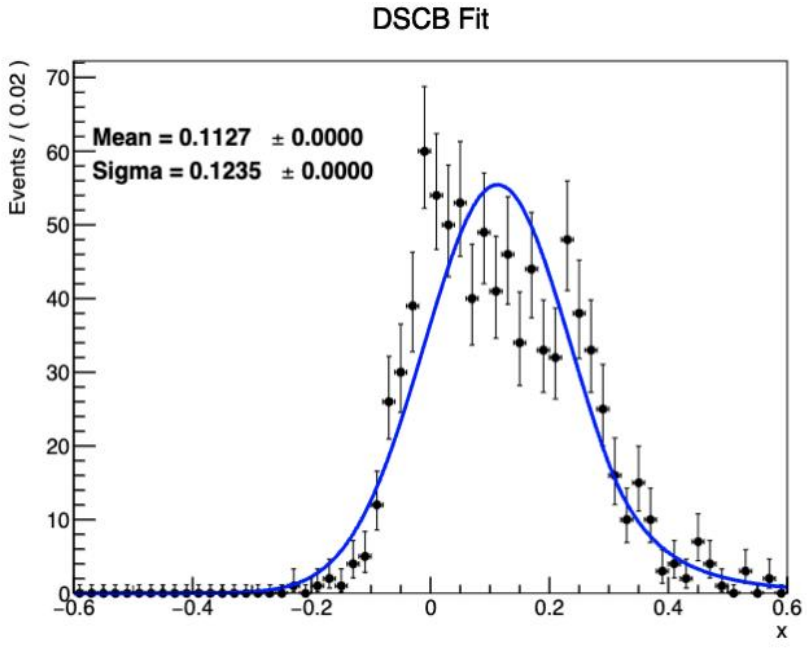
Jet2 `[20,50,60,70,75,80,90,100,110,140]`

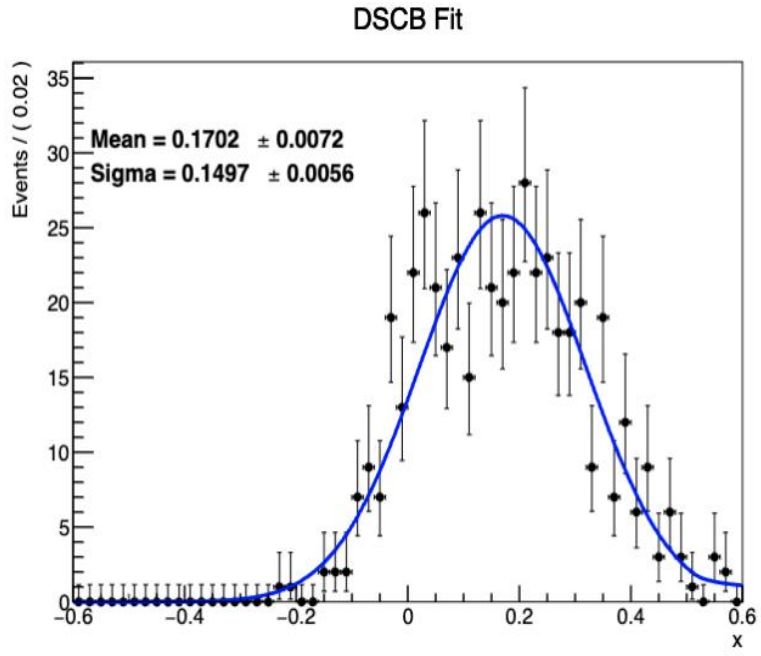


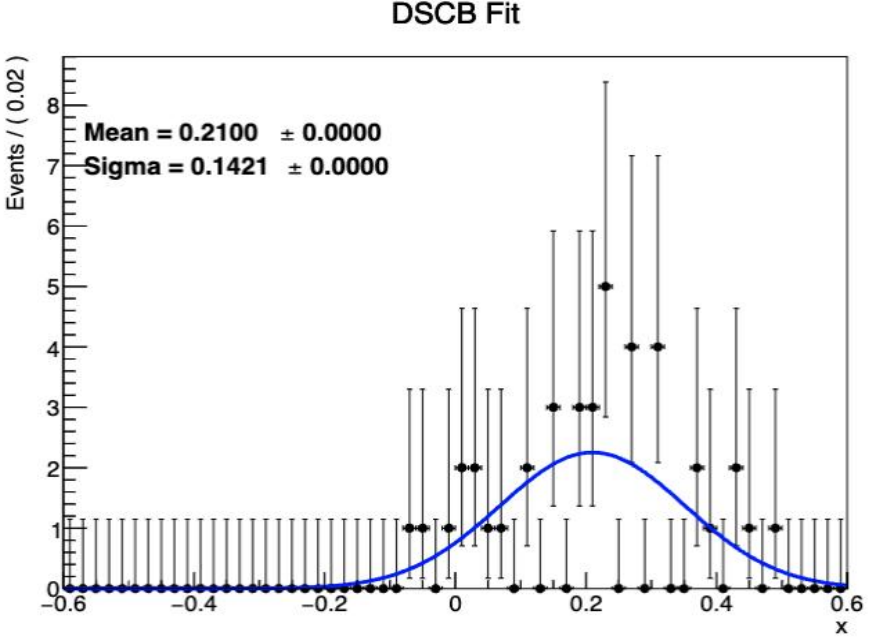


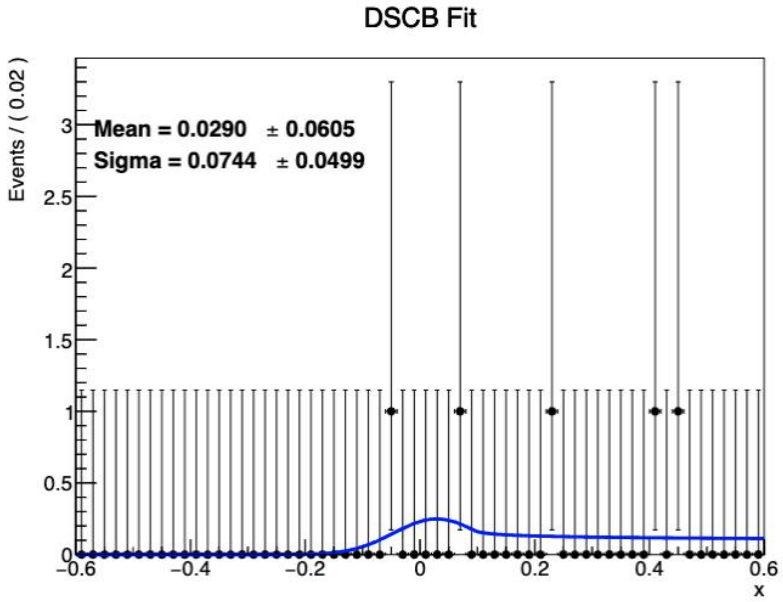


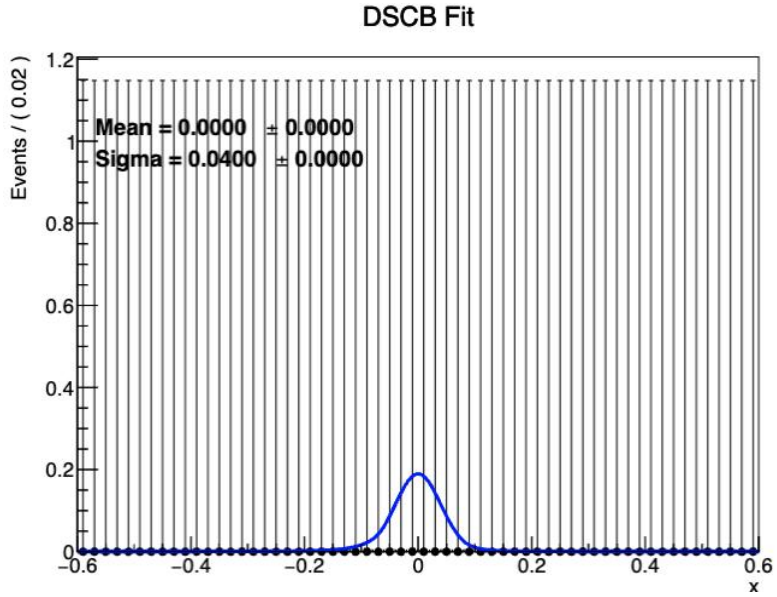












Jet1 has better energy resolution than Jet2.