



# Simulation Statistics

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# Contents

Histograms (true\_vs\_measured values, and resolution for energy, pseudorapidity, and azimuthal angle, as well as energy differences between tower, cluster, and true energies) for the following detector-particle pairs:

- Central Electromagnetic Calorimeter (CEMC): electron
- Endcap Electromagnetic Calorimeter (EEMC): electron
- Forward Electromagnetic Calorimeter (FEMC): electron
- Forward Hadronic Calorimeter (FHCAL): pion
- Inner Hadronic Calorimeter (HCALIN): pion
- Outer Hadronic Calorimeter (HCALOUT): pion

# Simulation Parameters

$e^-$ ,  $\pi^-$  (100k)

$p$ : [0,30] GeV/c

cut:  $e > 0.2$  GeV;  
detector-wise  
eta cuts

Eta: [-4,4]

phi: [- $\pi$ , $\pi$ ]

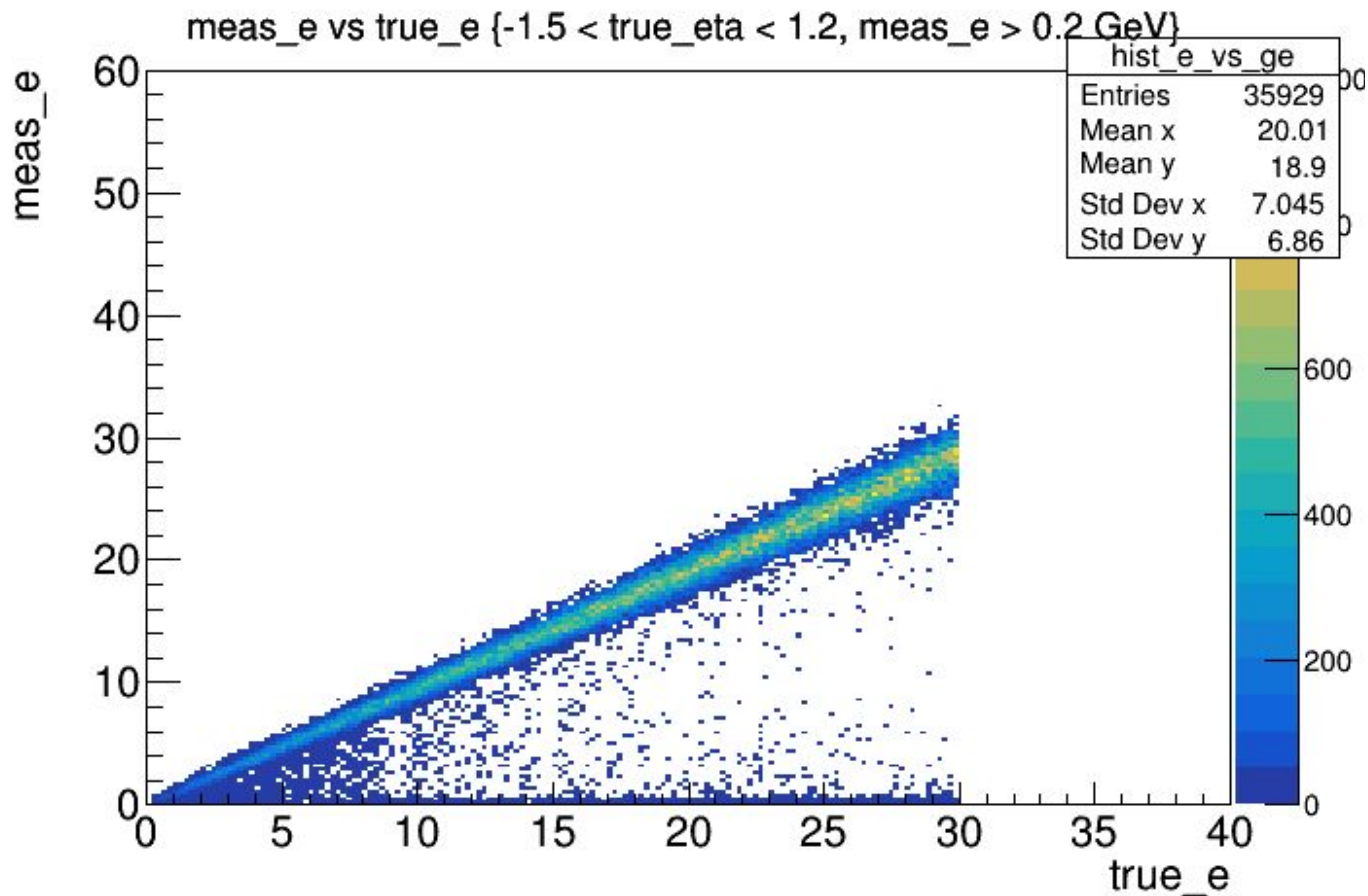
default units



**CEMC**

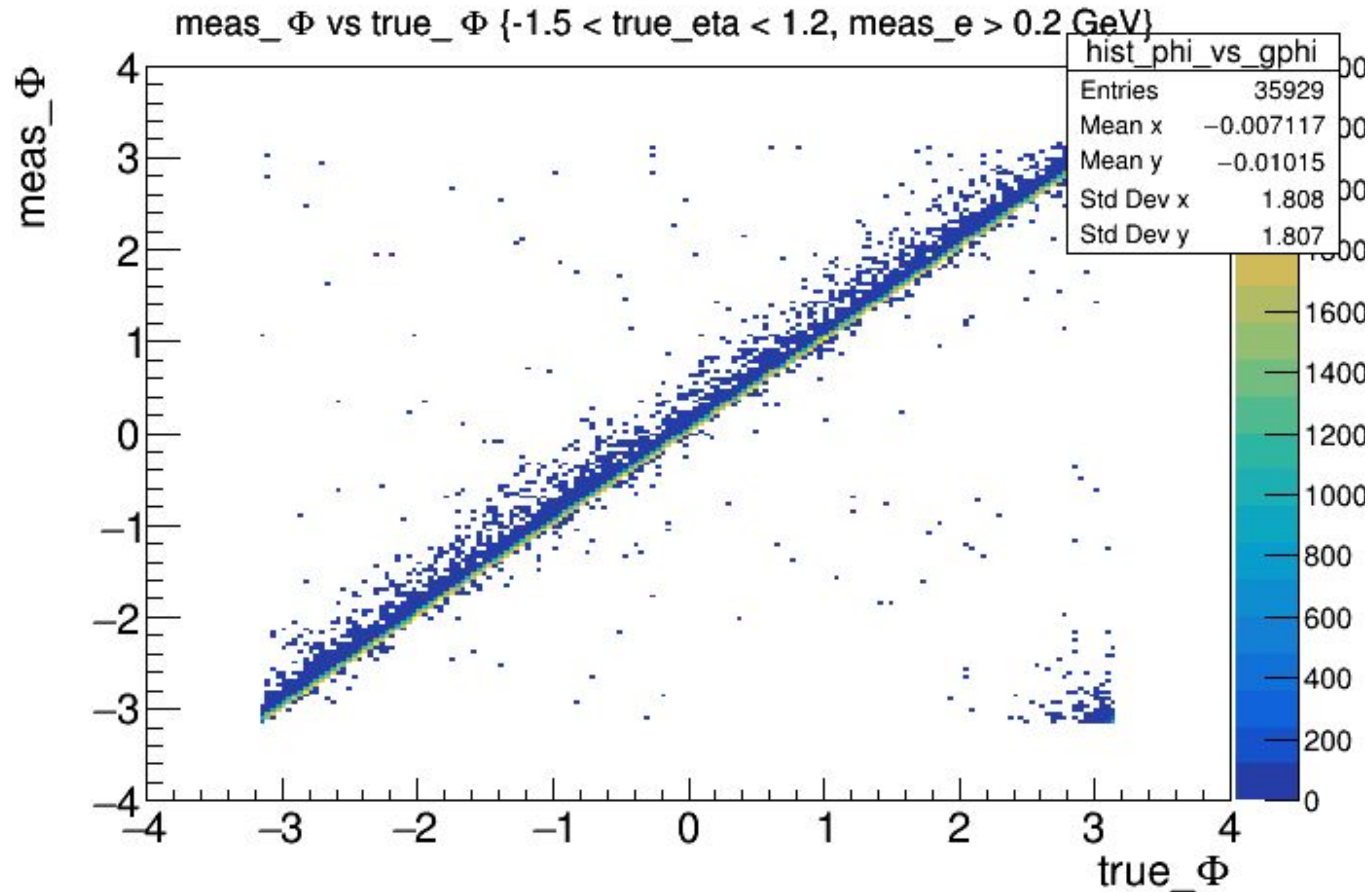
# CEMC ( $e^-$ )

e vs ge  
Explicit  $\eta$  cut: -1.5 to 1.2  
Energy Cut: 0.2GeV



# CEMC ( $e^-$ )

phi vs gphi  
Explicit  $\eta$  cut: -1.5 to 1.2  
Energy Cut: 0.2GeV

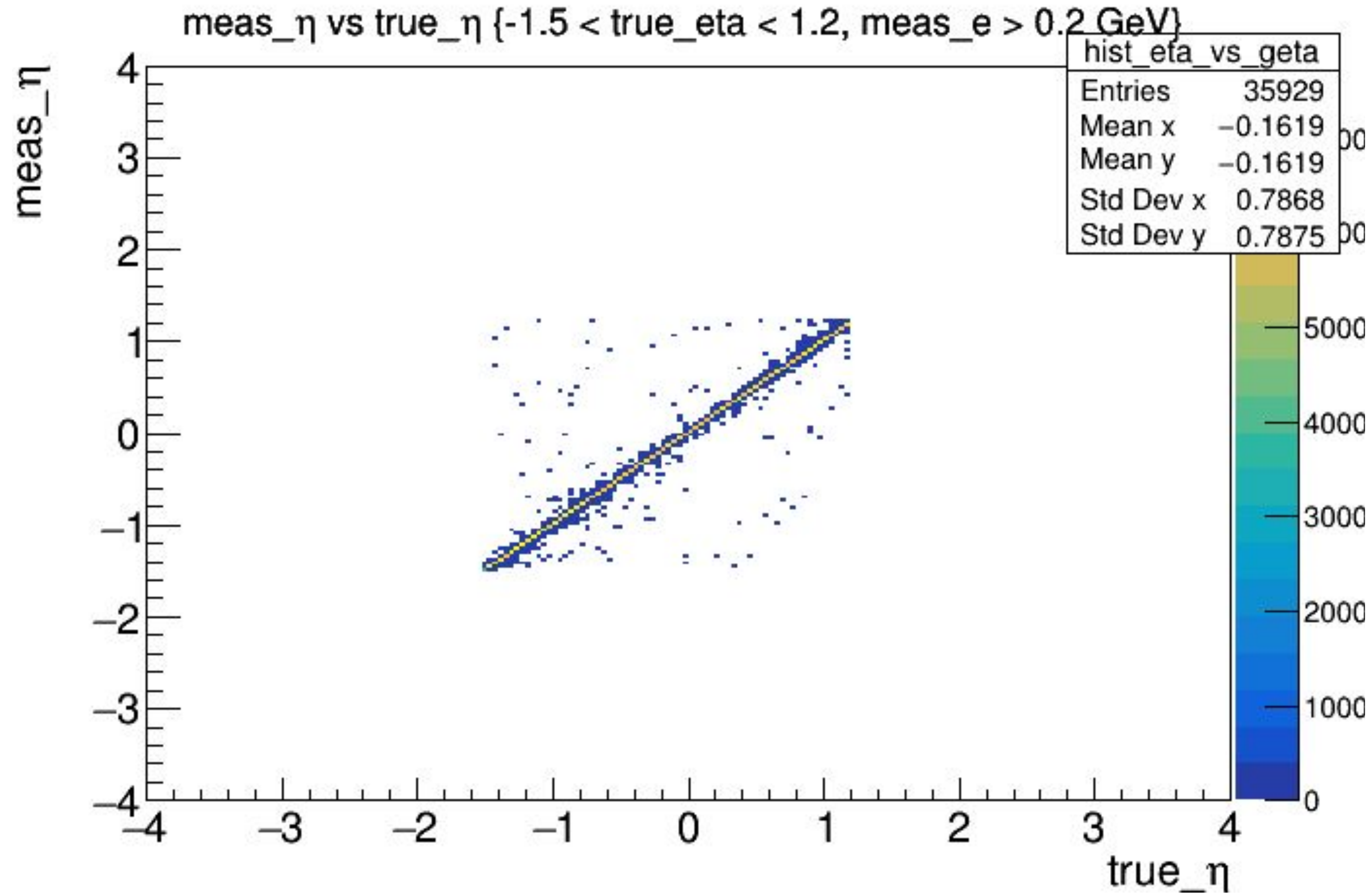


# CEMC ( $e^-$ )

eta vs geta

Explicit  $\eta$  cut: -1.5 to 1.2

Energy Cut: 0.2GeV

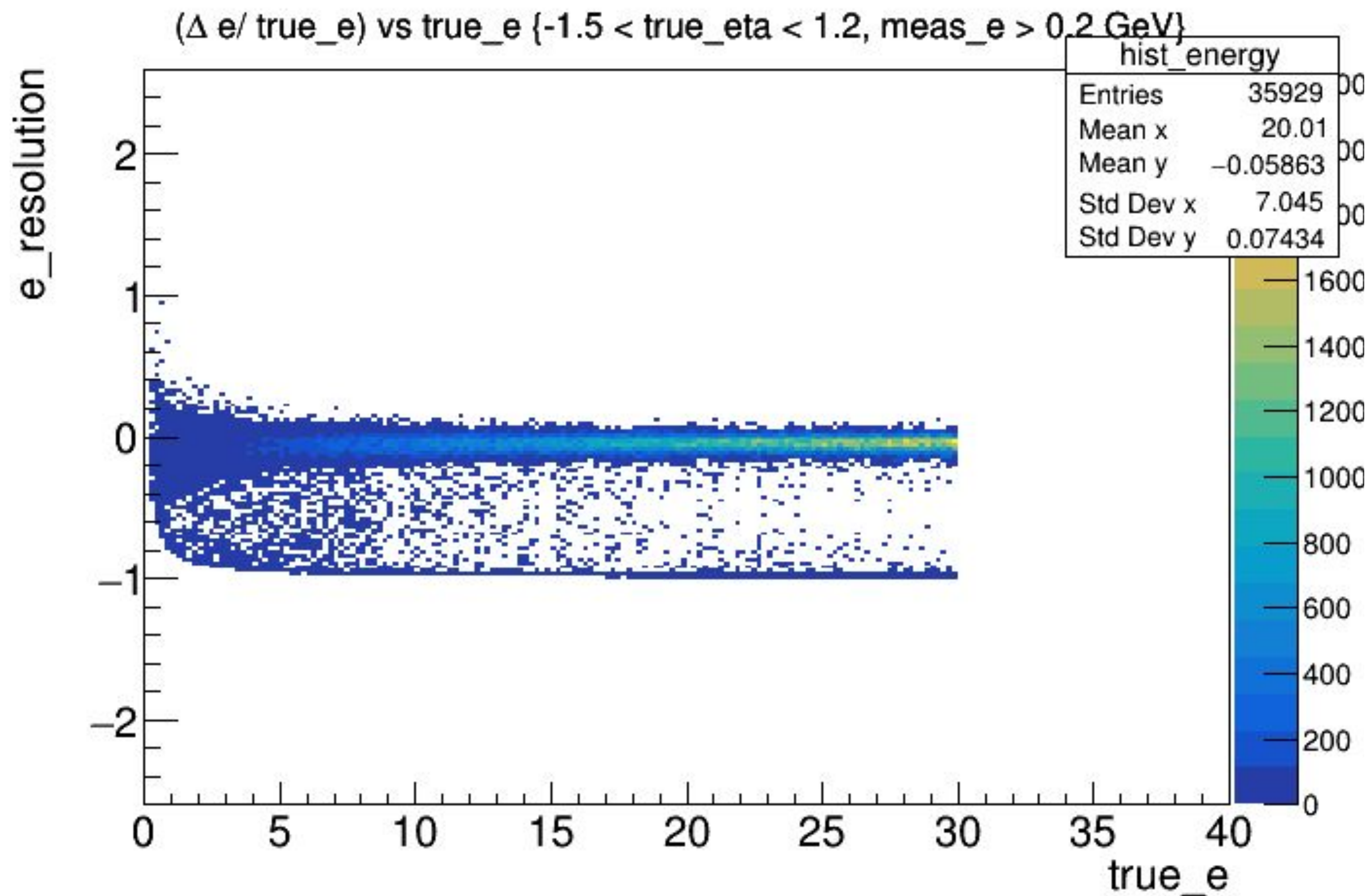


# CEMC ( $e^-$ )

$\Delta e/ge$  vs  $ge$

Explicit  $\eta$  cut: -1.5 to 1.2

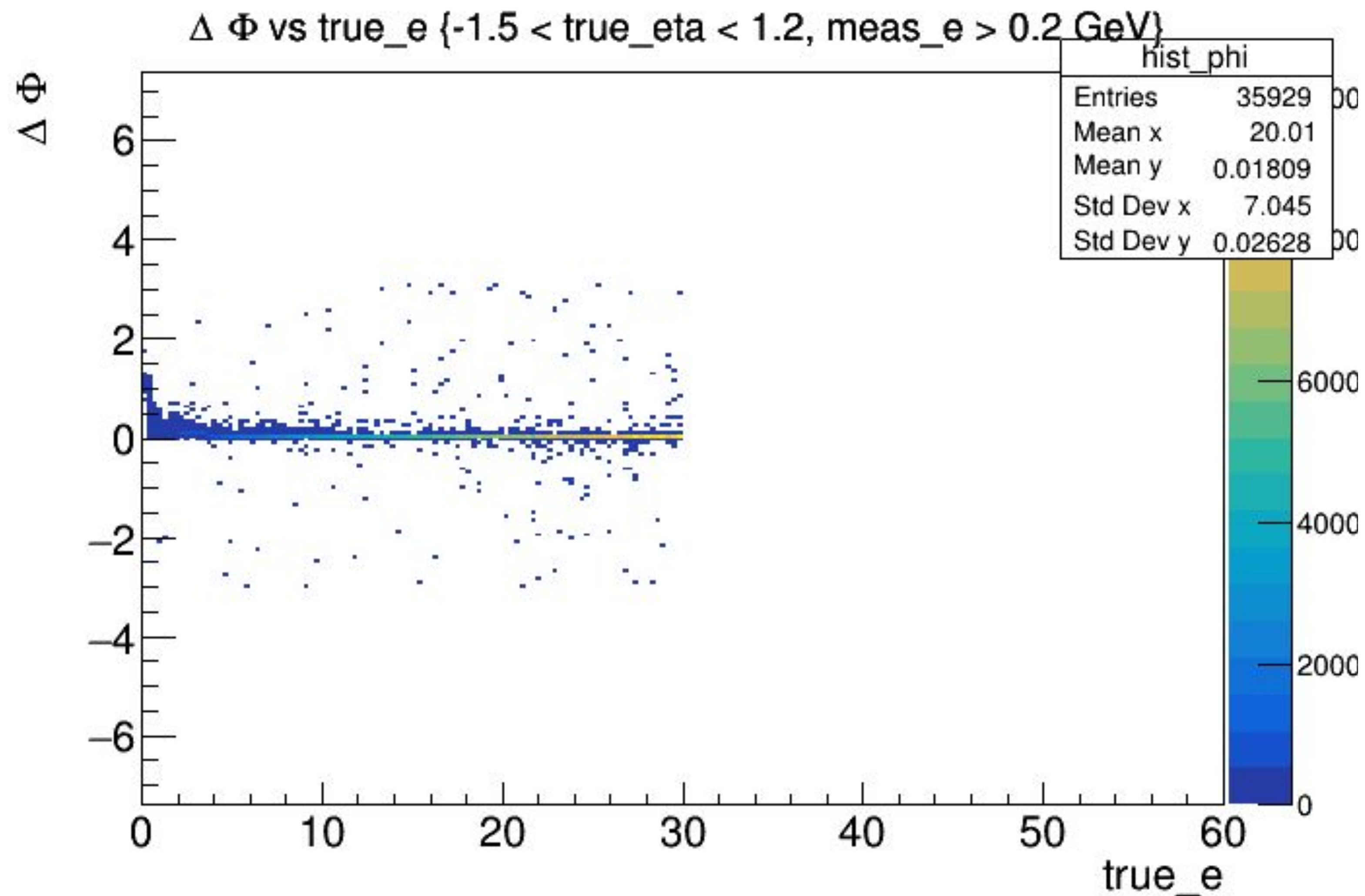
Energy Cut: 0.2GeV





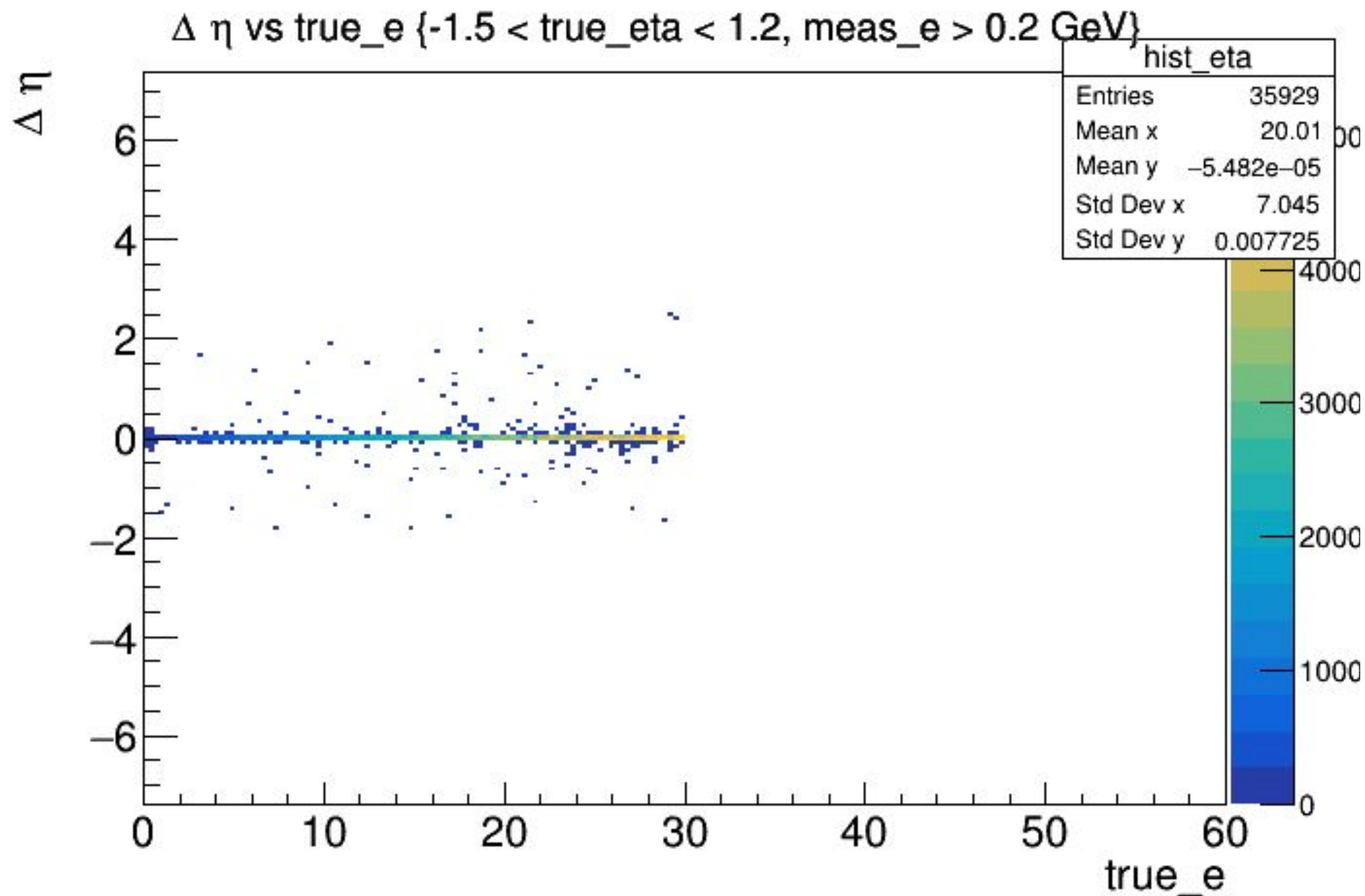
# CEMC ( $e^-$ )

$\Delta\phi$  vs  $g_e$   
Explicit  $\eta$  cut: -1.5 to 1.2  
Energy Cut: 0.2 GeV



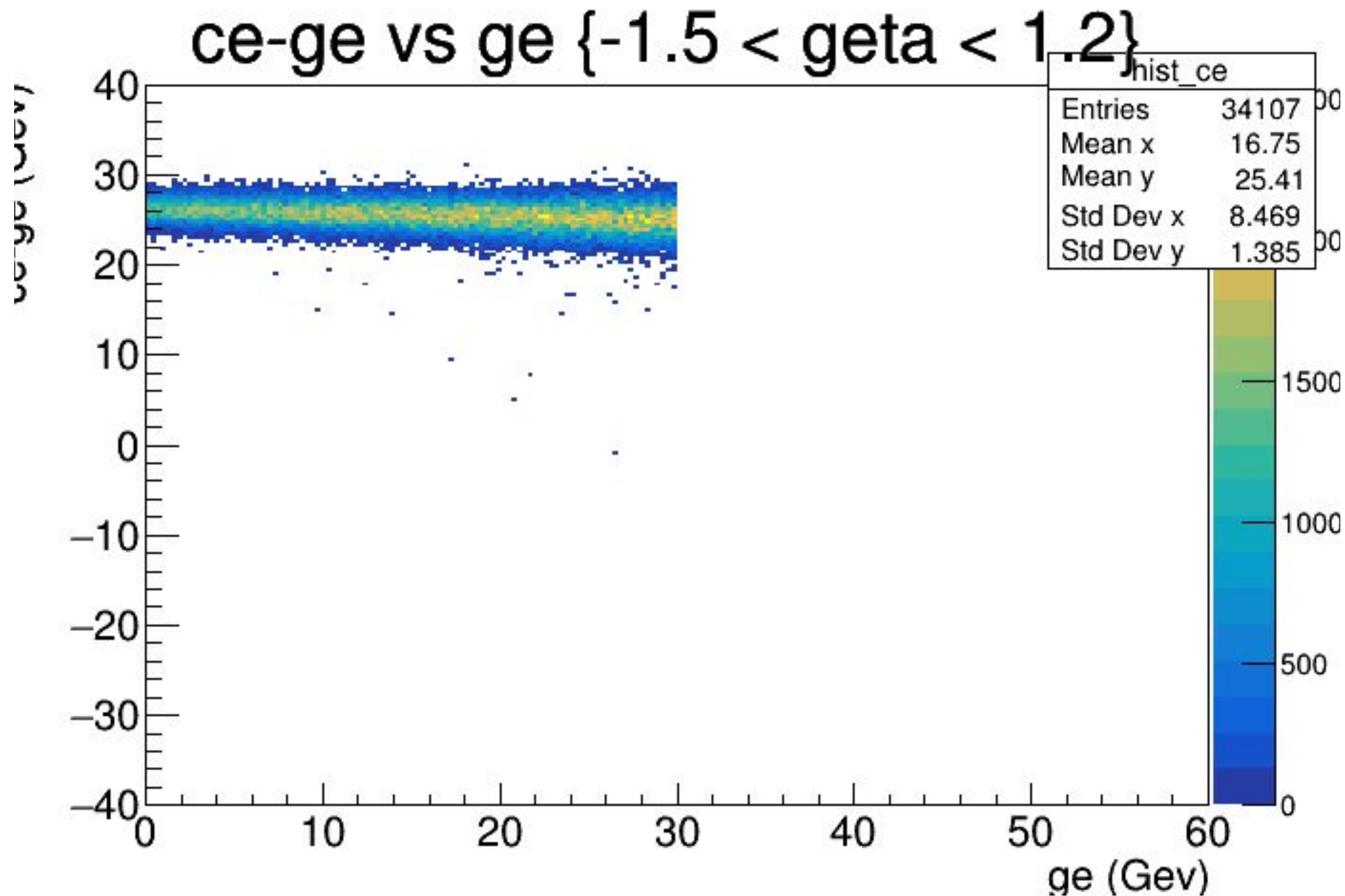
# CEMC ( $e^-$ )

$\Delta\eta$  vs  $g_e$   
Explicit  $\eta$  cut: -1.5 to 1.2  
Energy Cut: 0.2GeV



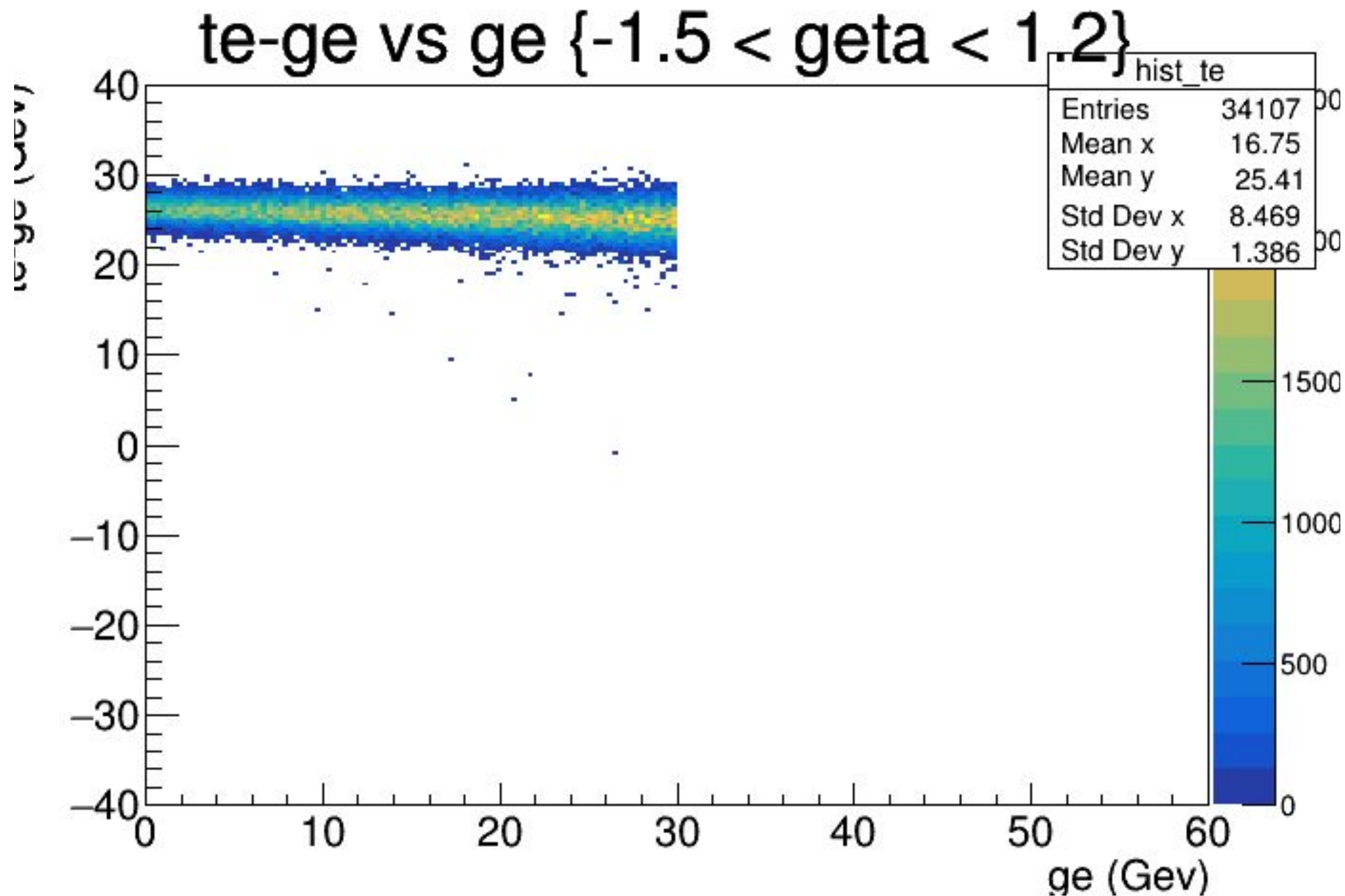
# CEMC ( $e^-$ )

(ce-ge) vs ge  
Explicit  $\eta$  cut: -1.5 to 1.2



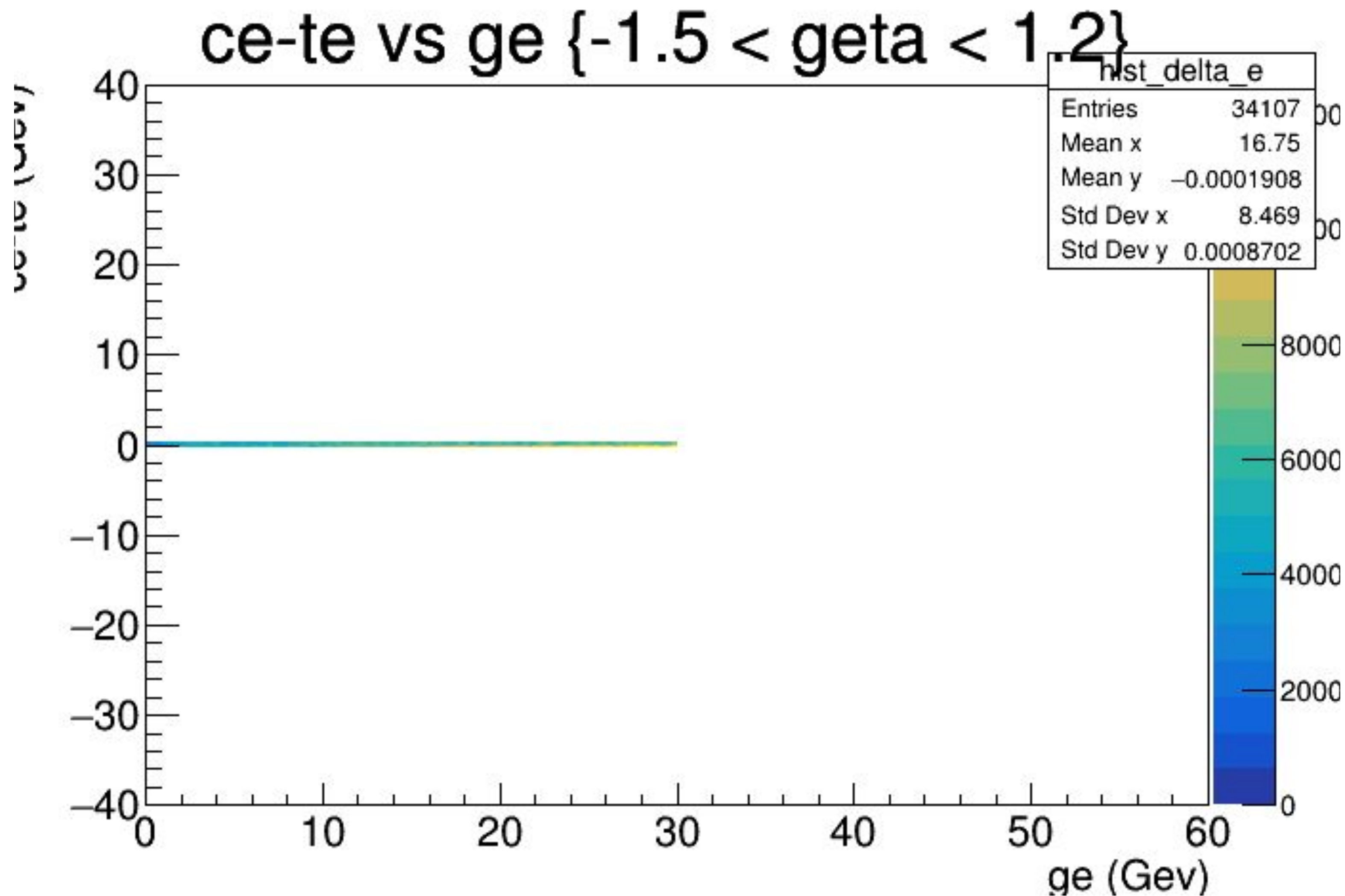
# CEMC ( $e^-$ )

( $t_e - g_e$ ) vs  $g_e$   
Explicit  $\eta$  cut: -1.5 to 1.2



# CEMC ( $e^-$ )

(ce-te) vs ge  
Explicit  $\eta$  cut: -1.5 to 1.2



# CEMC ( $e^-$ )

Total Energy Counts  
Explicit  $\eta$  cut: -1.5 to 1.2

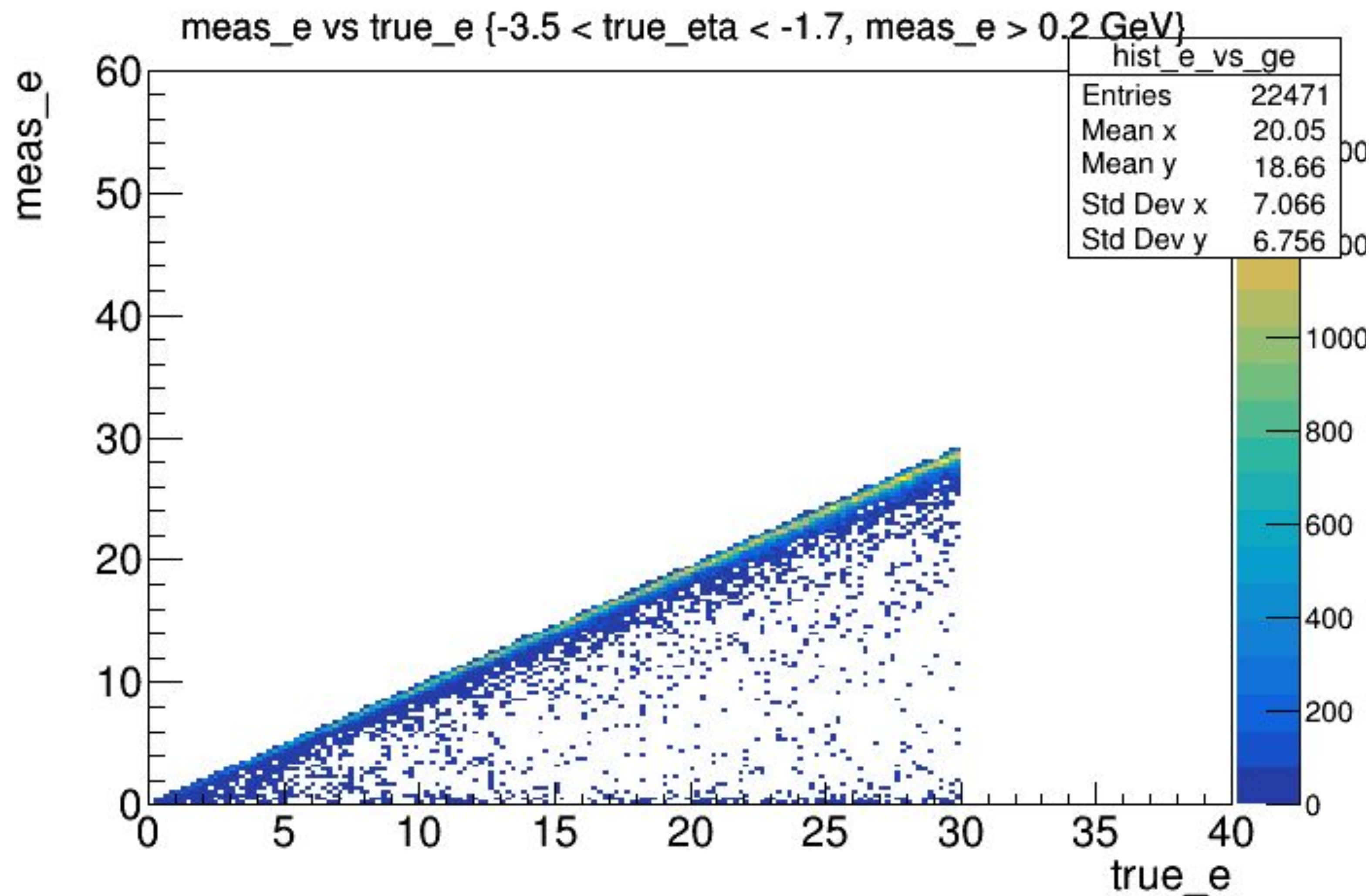
The total ce is:	1.37864e+06	GeV
The total te is:	1.37865e+06	GeV
The total ge is:	510836	GeV



**EEMC**

# EEMC ( $e^-$ )

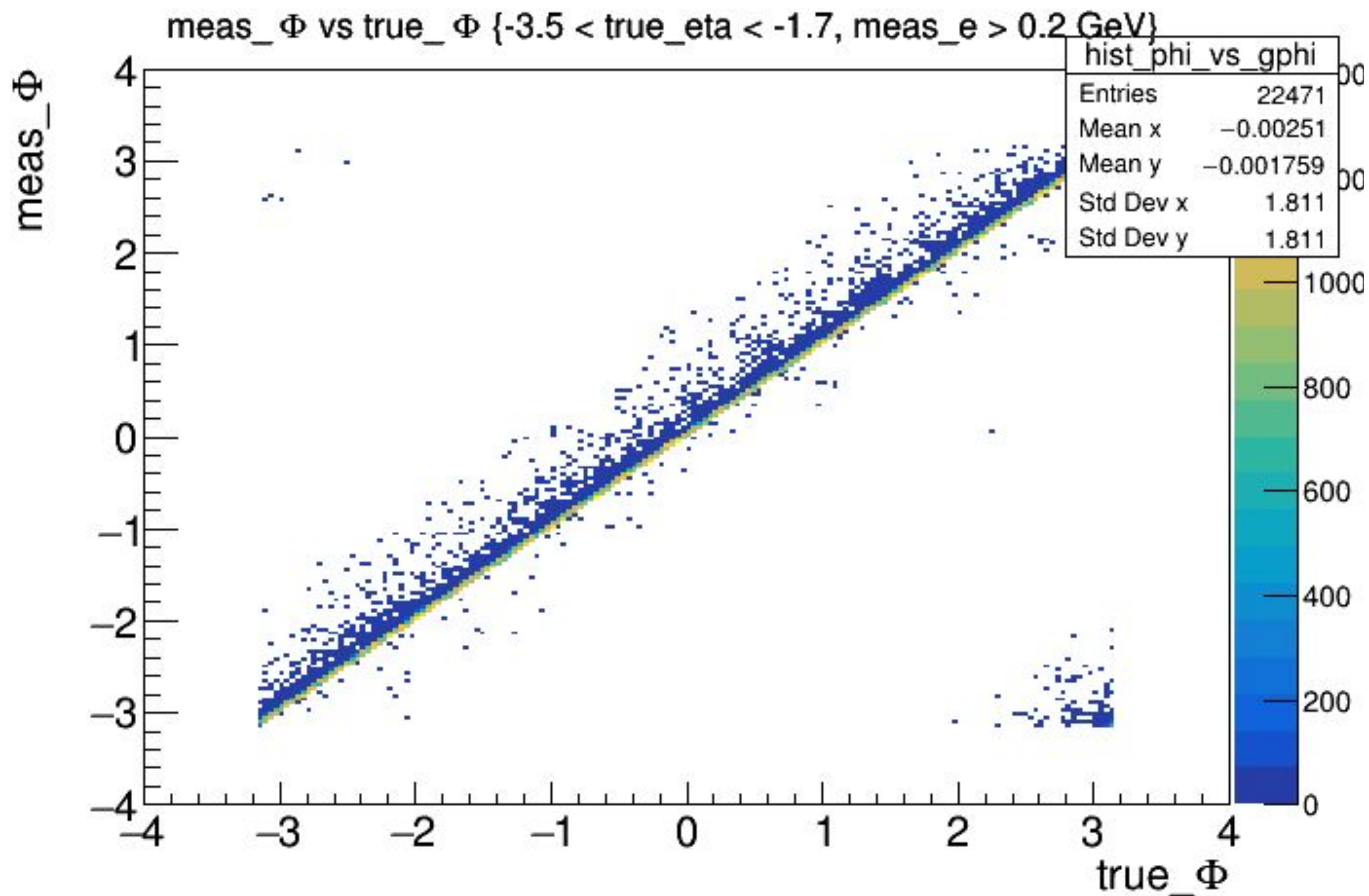
e vs ge  
Explicit  $\eta$  cut: -3.5 to -1.7  
Energy Cut: 0.2GeV





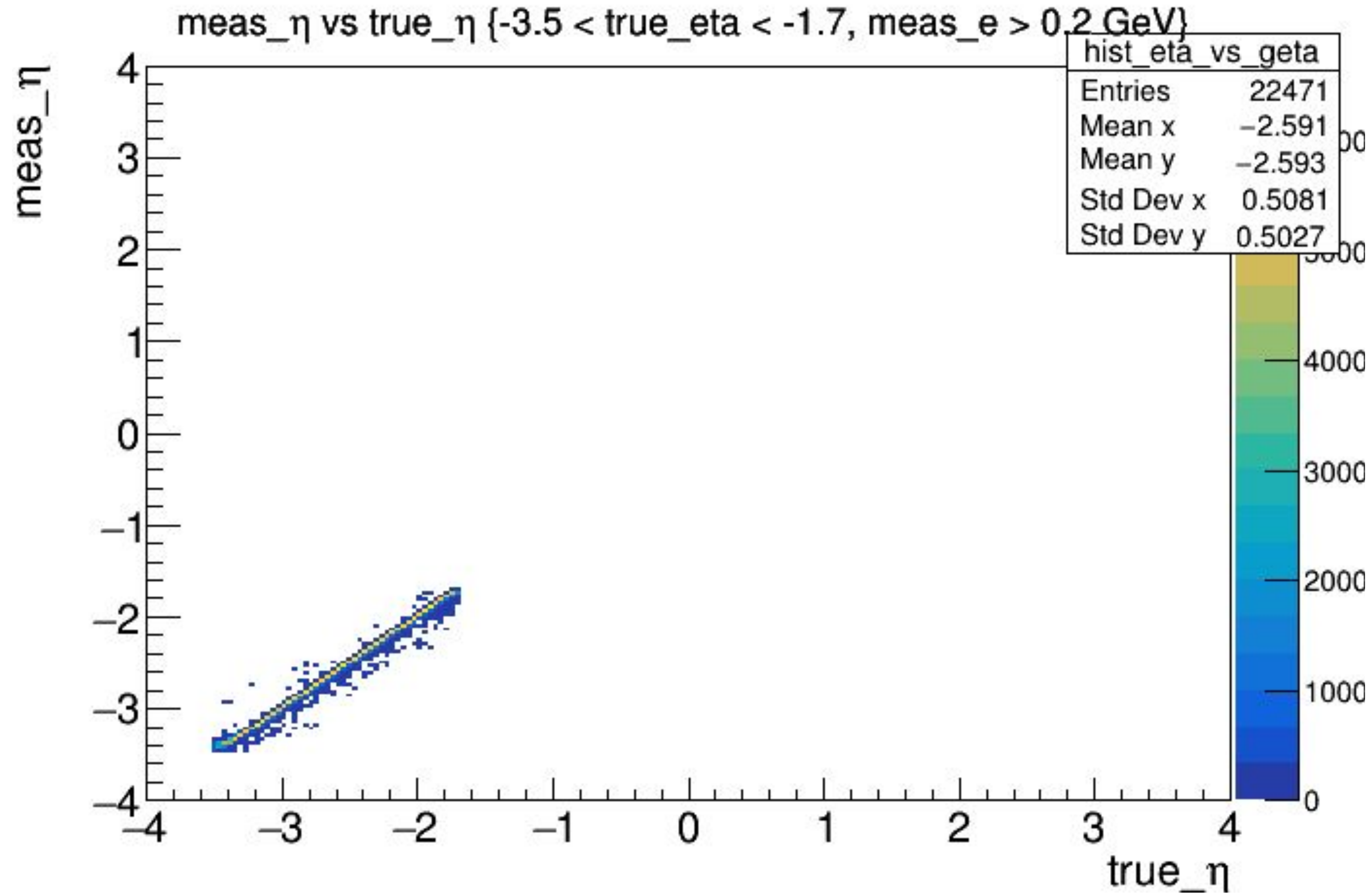
# EEMC ( $e^-$ )

phi vs gphi  
Explicit  $\eta$  cut: -3.5 to -1.7  
Energy Cut: 0.2GeV



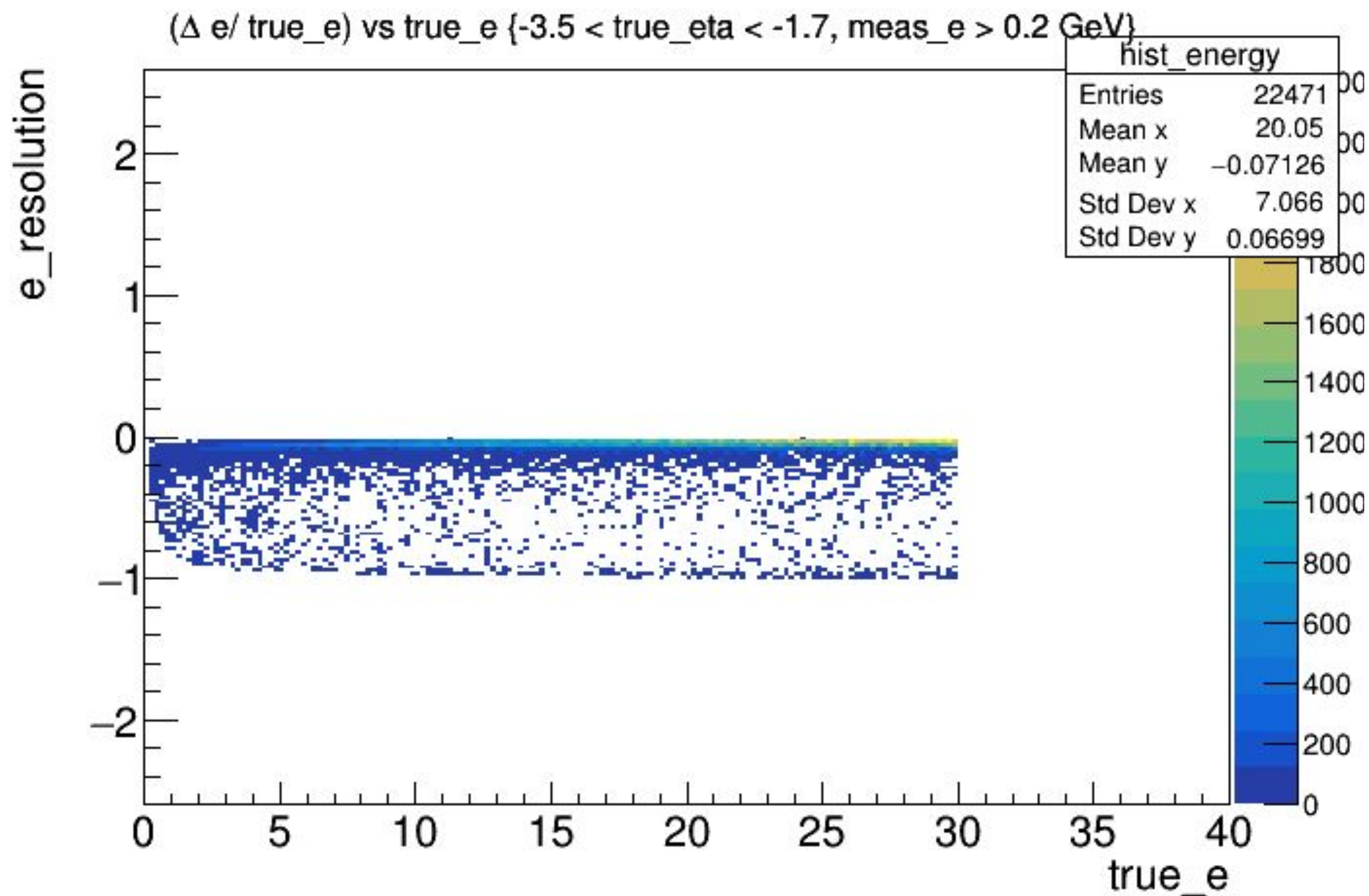
# EEMC ( $e^-$ )

eta vs geta  
Explicit  $\eta$  cut: -3.5 to -1.7  
Energy Cut: 0.2GeV



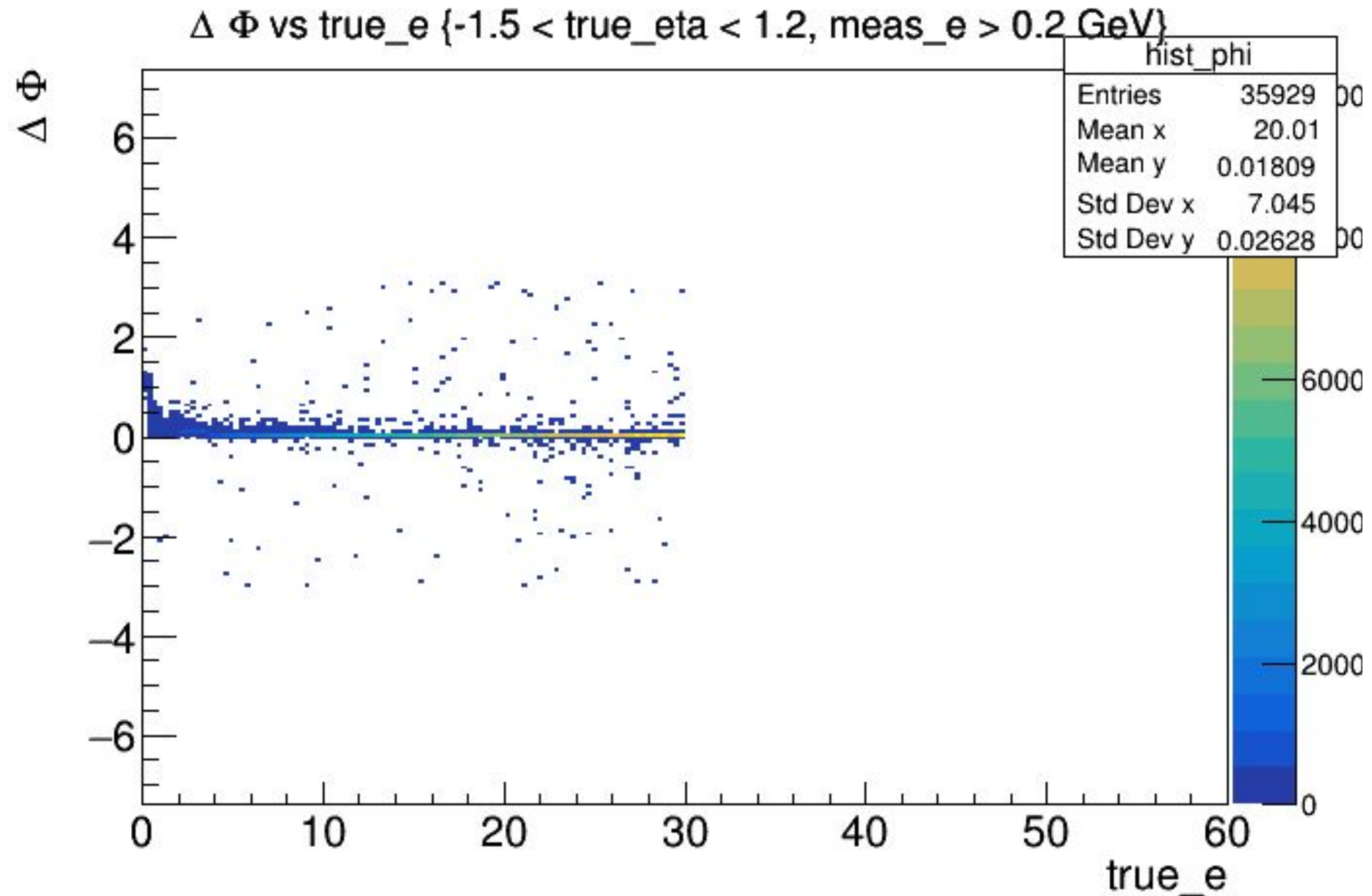
# EEMC ( $e^-$ )

$\Delta e/ge$  vs  $ge$   
Explicit  $\eta$  cut: -3.5 to -1.7  
Energy Cut: 0.2GeV



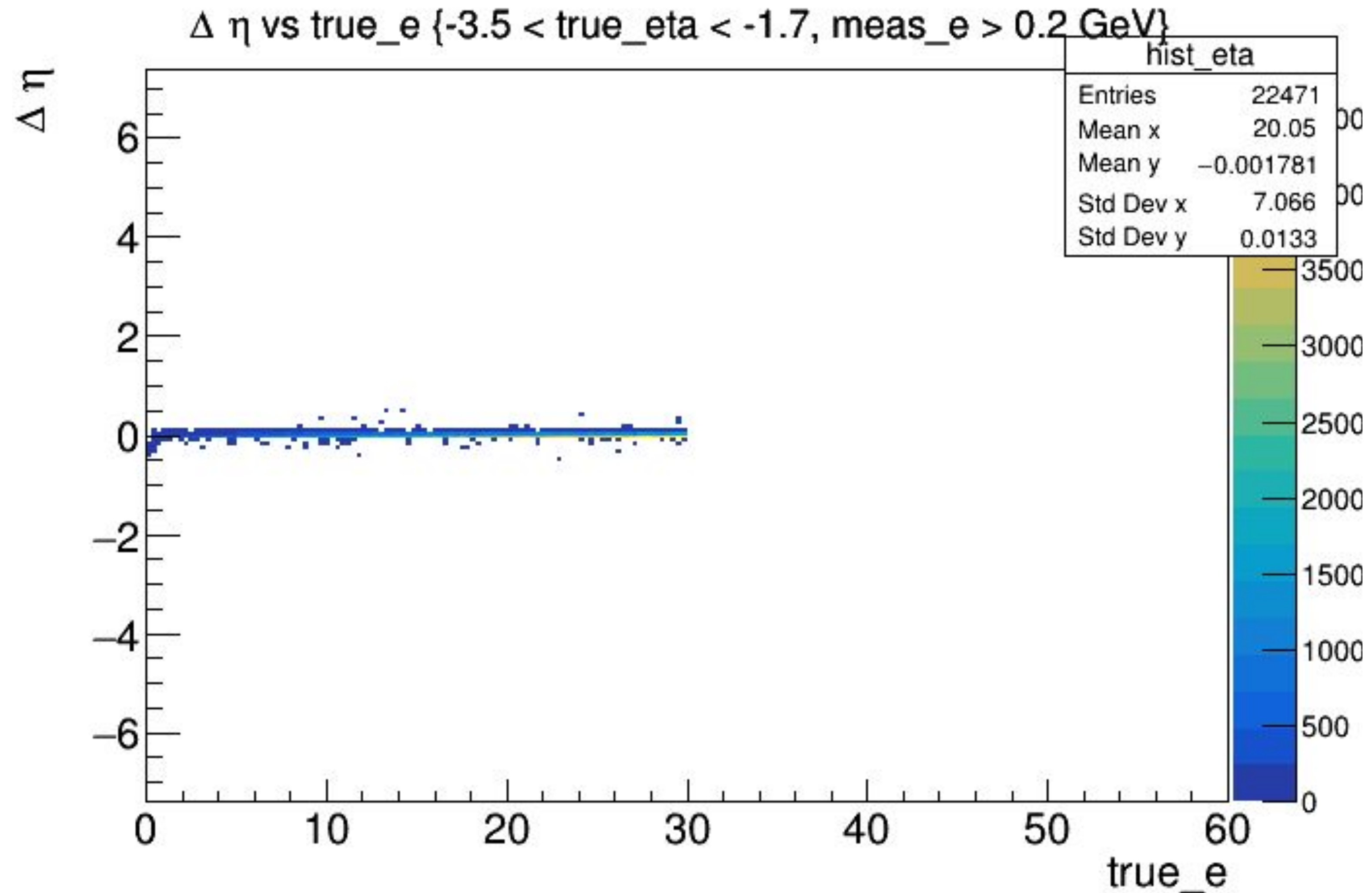
# EEMC ( $e^-$ )

$\Delta\phi$  vs  $g_e$   
Explicit  $\eta$  cut: -3.5 to -1.7  
Energy Cut: 0.2GeV



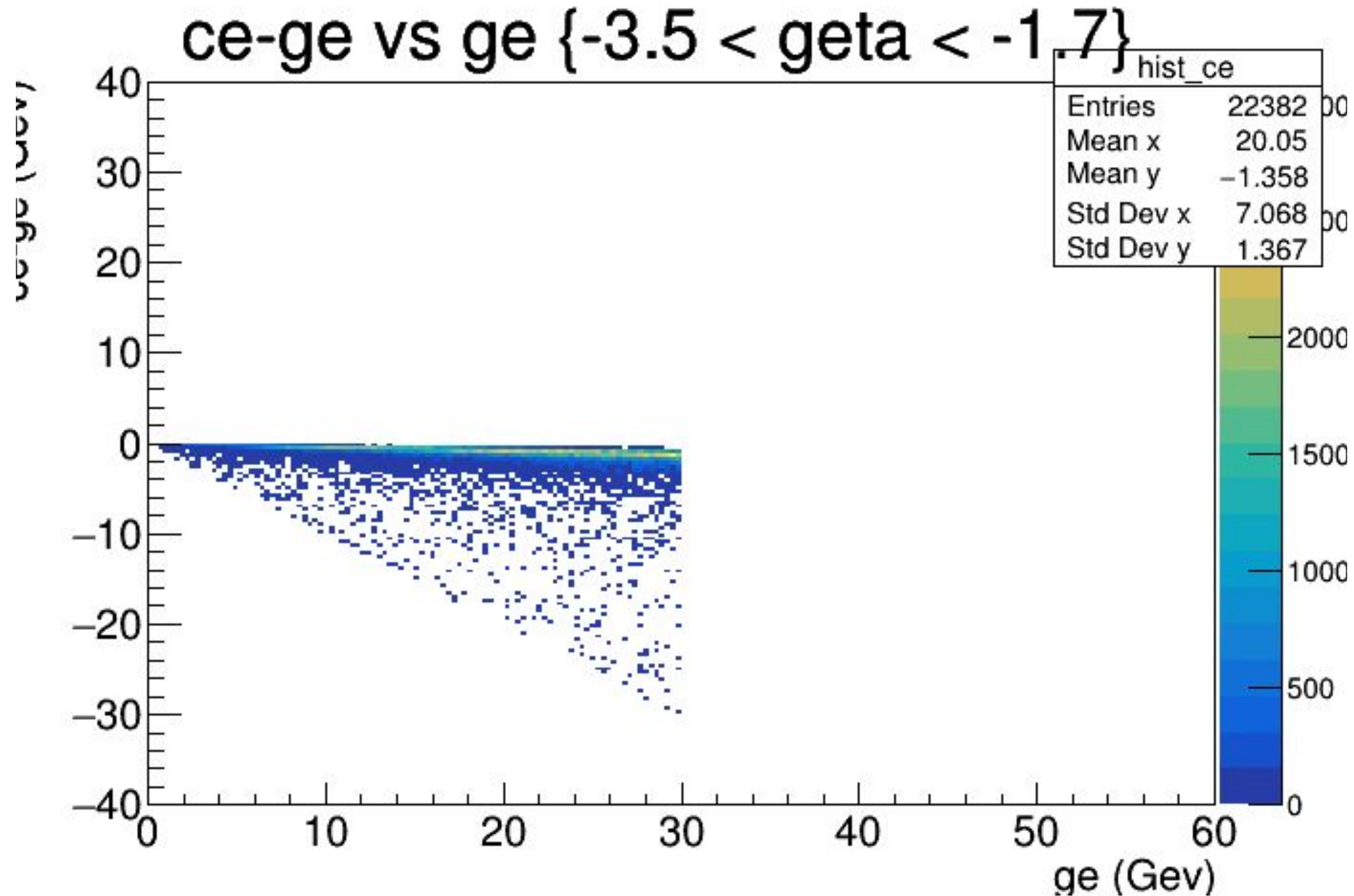
# EEMC ( $e^-$ )

$\Delta\eta$  vs  $g_e$   
Explicit  $\eta$  cut: -3.5 to -1.7  
Energy Cut: 0.2 GeV



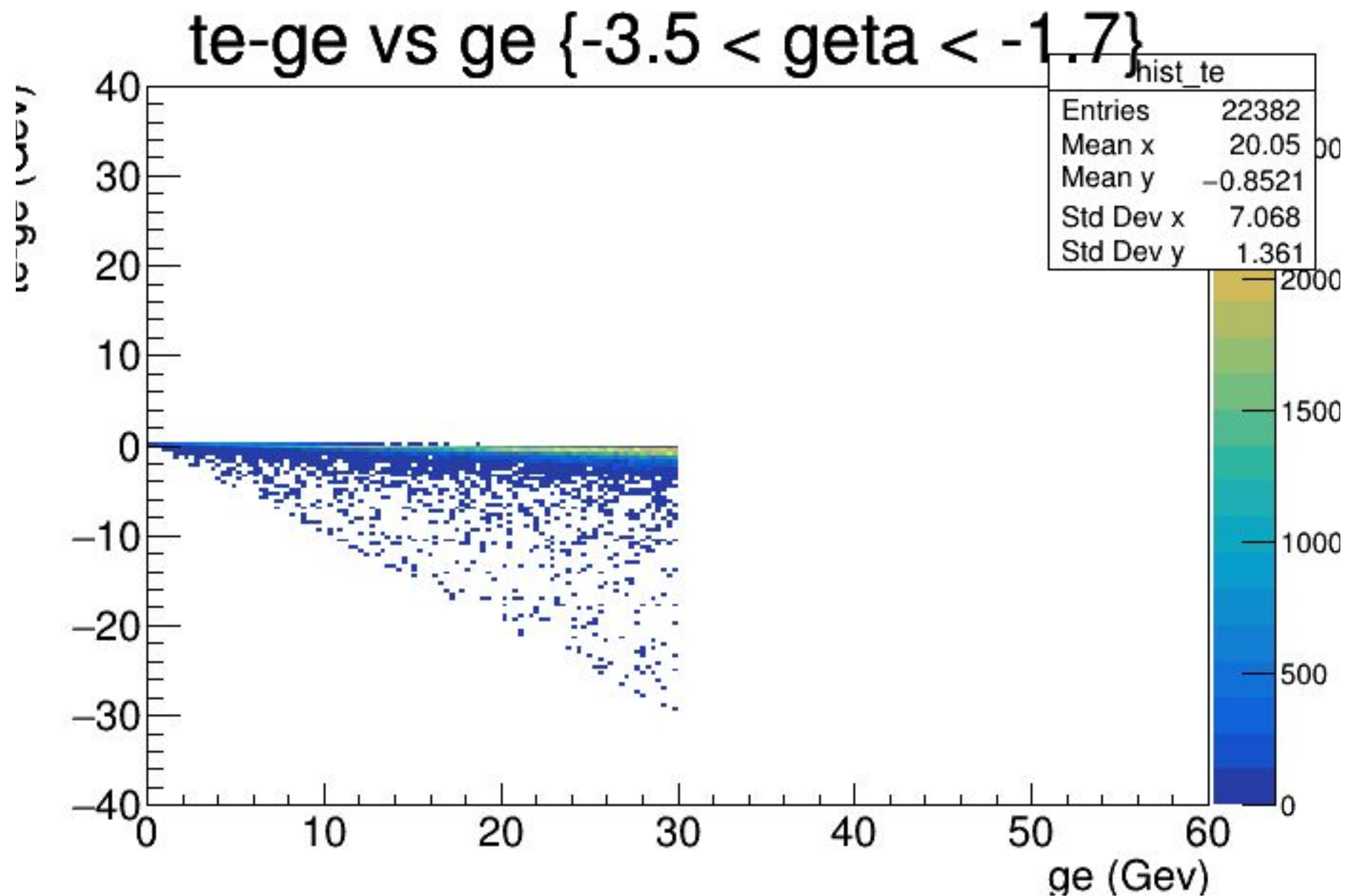
# EEMC ( $e^-$ )

(ce-ge) vs ge  
Explicit  $\eta$  cut: -3.5 to -1.7



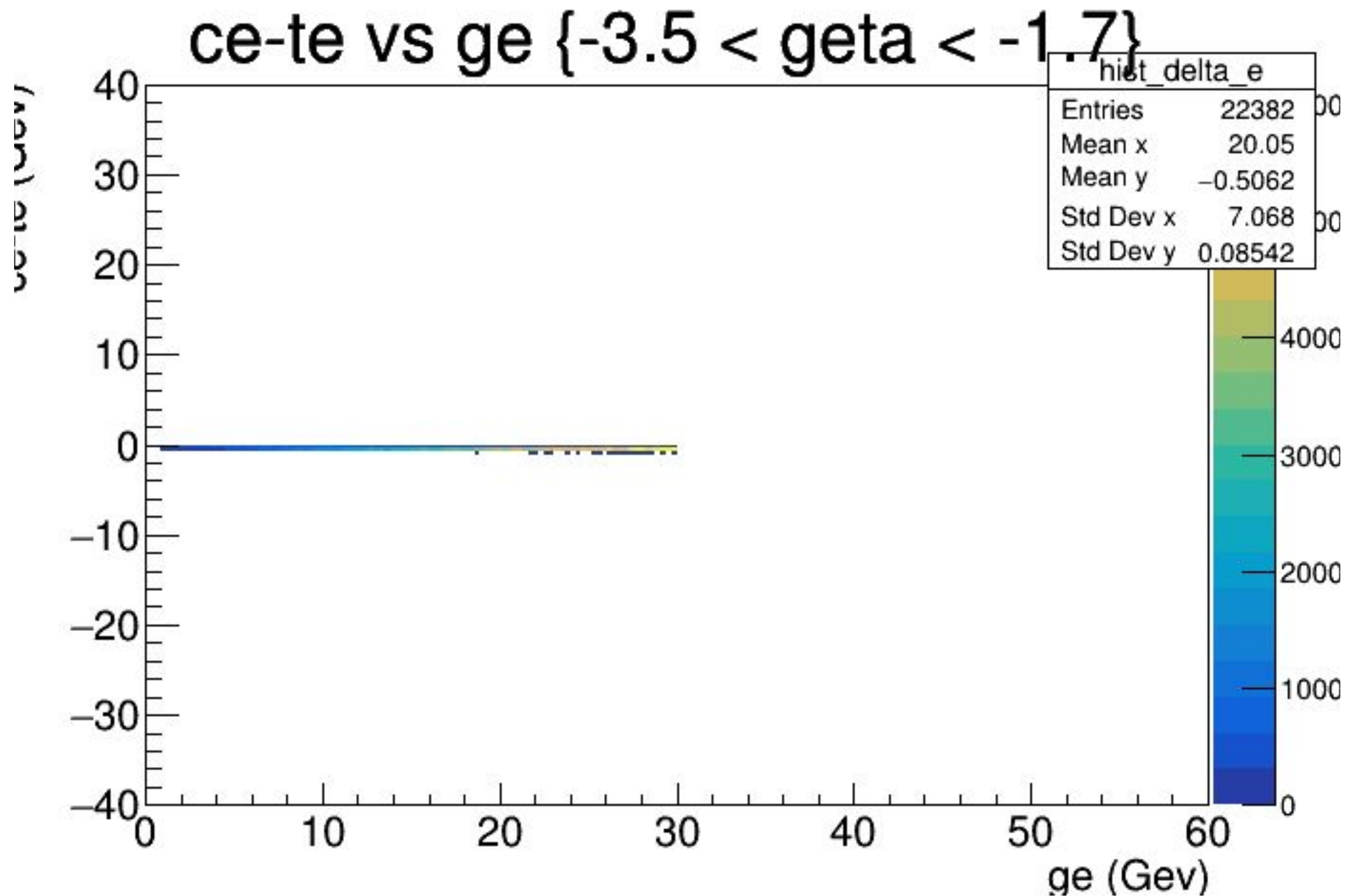
# EEMC ( $e^-$ )

( $t_e - g_e$ ) vs  $g_e$   
Explicit  $\eta$  cut: -3.5 to -1.7



# EEMC ( $e^-$ )

(ce-te) vs  $g_e$   
Explicit  $\eta$  cut: -3.5 to -1.7





# EEMC ( $e^-$ )

Total Energy Counts  
Explicit  $\eta$  cut: -3.5 to -1.7

The total ce is:

308486 GeV

The total te is:

318776 GeV

The total ge is:

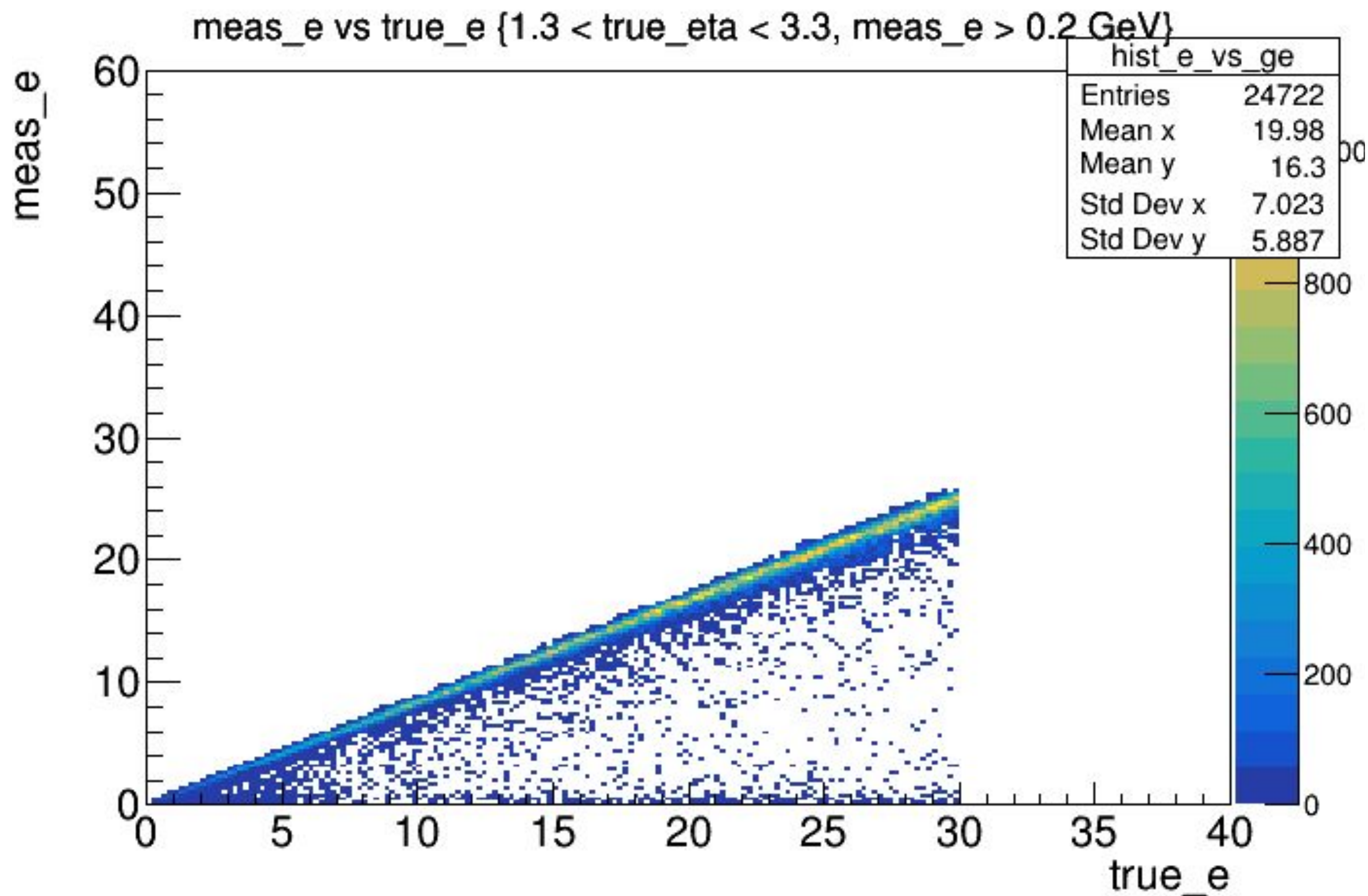
336252 GeV



**FEMC**

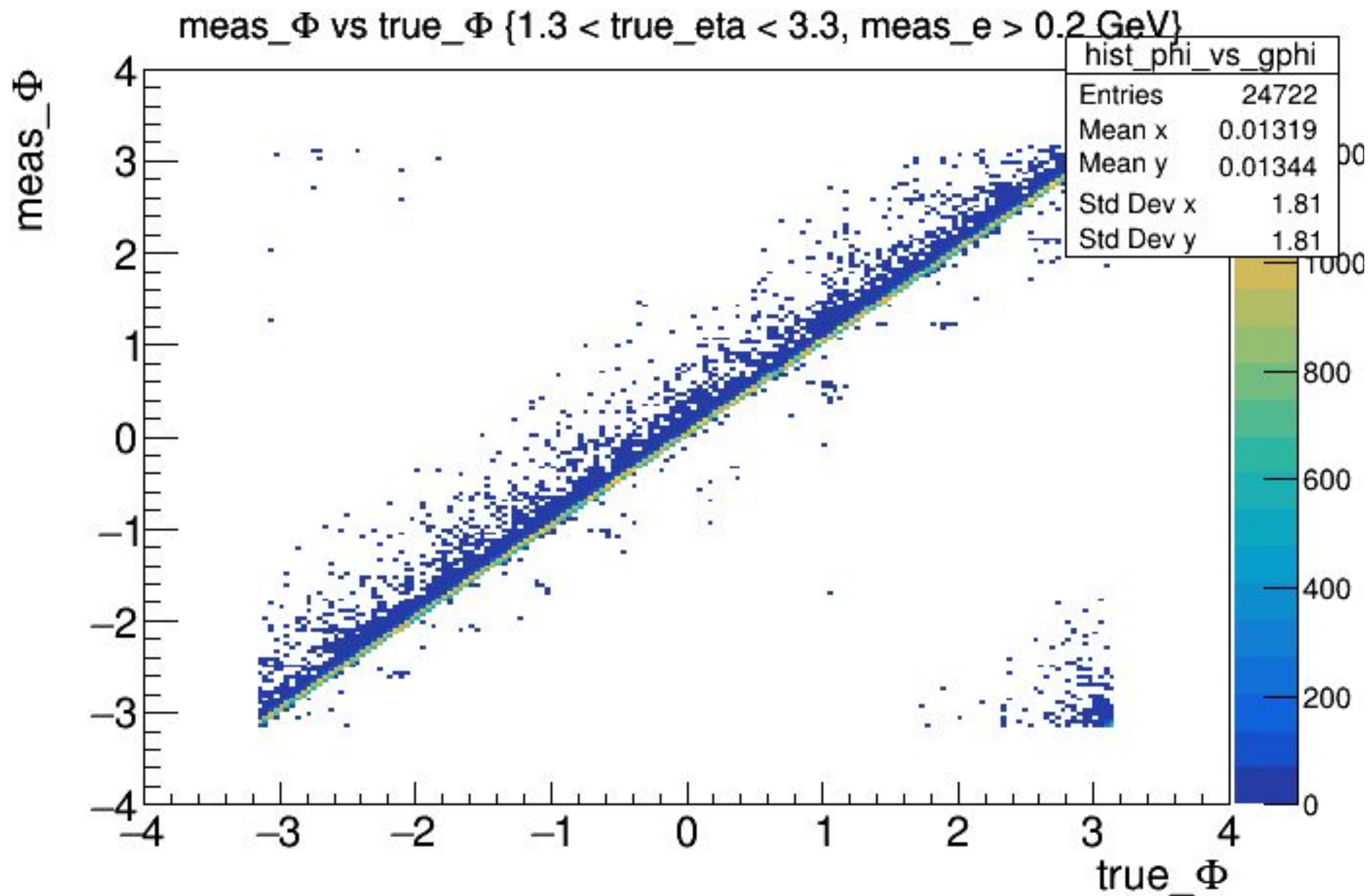
# FEMC ( $e^-$ )

e vs ge  
Explicit  $\eta$  cut: 1.3 to 3.3  
Energy Cut: 0.2GeV



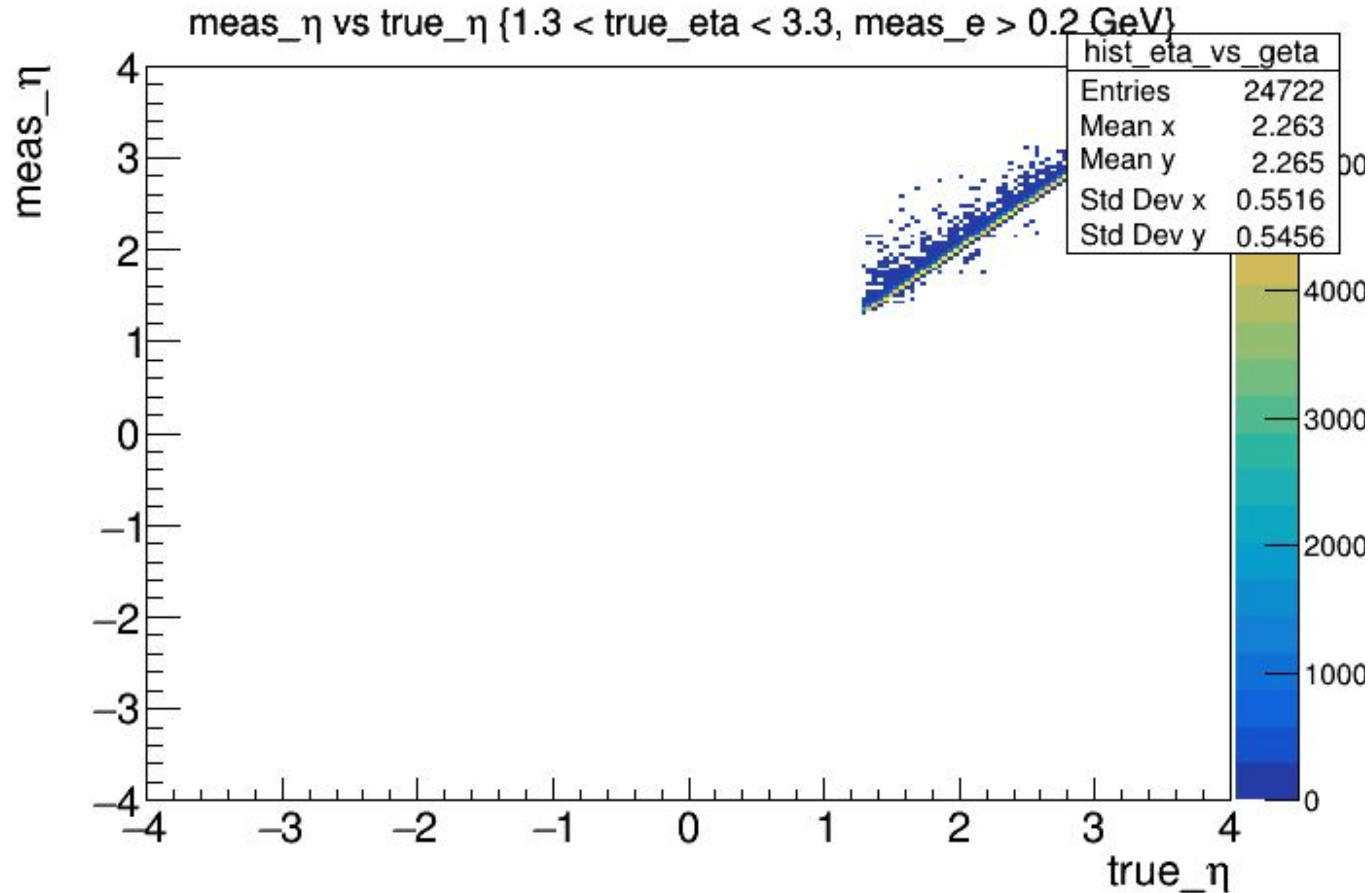
# FEMC ( $e^-$ )

phi vs gphi  
Explicit  $\eta$  cut: 1.3 to 3.3  
Energy Cut: 0.2GeV



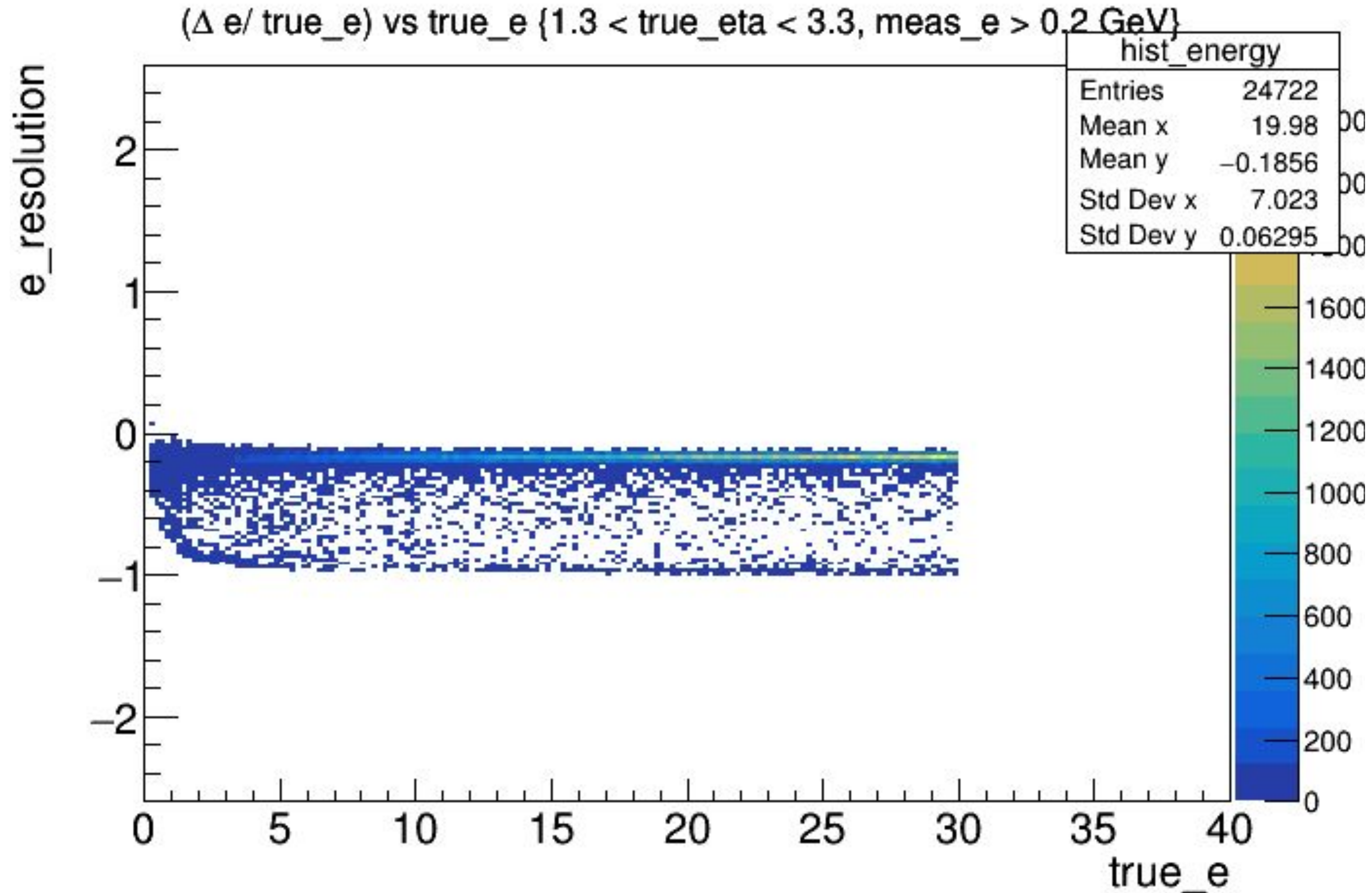
# FEMC ( $e^-$ )

eta vs geta  
Explicit  $\eta$  cut: 1.3 to 3.3  
Energy Cut: 0.2GeV



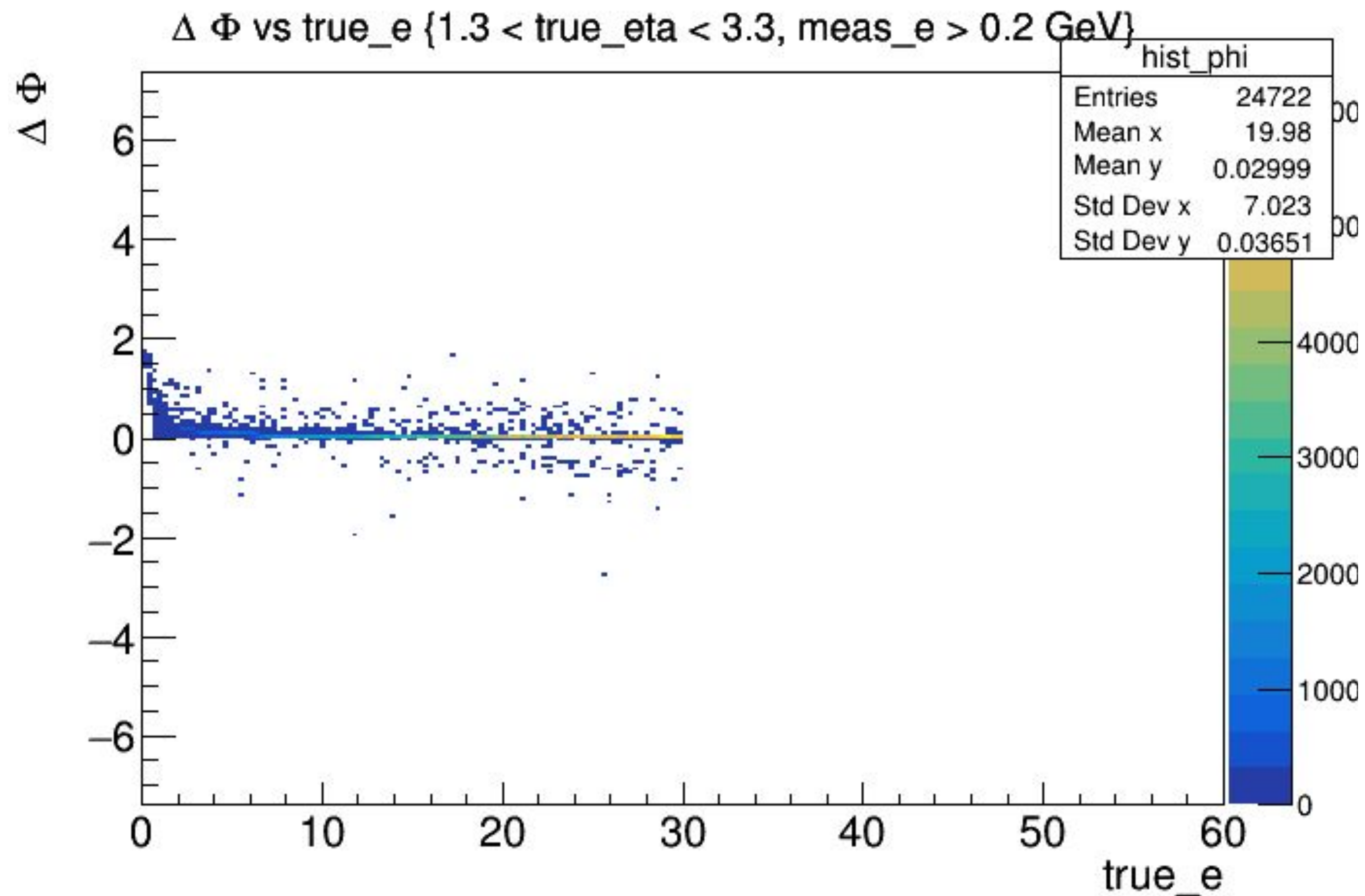
# FEMC ( $e^-$ )

$\Delta e/ge$  vs  $ge$   
Explicit  $\eta$  cut: 1.3 to 3.3  
Energy Cut: 0.2GeV



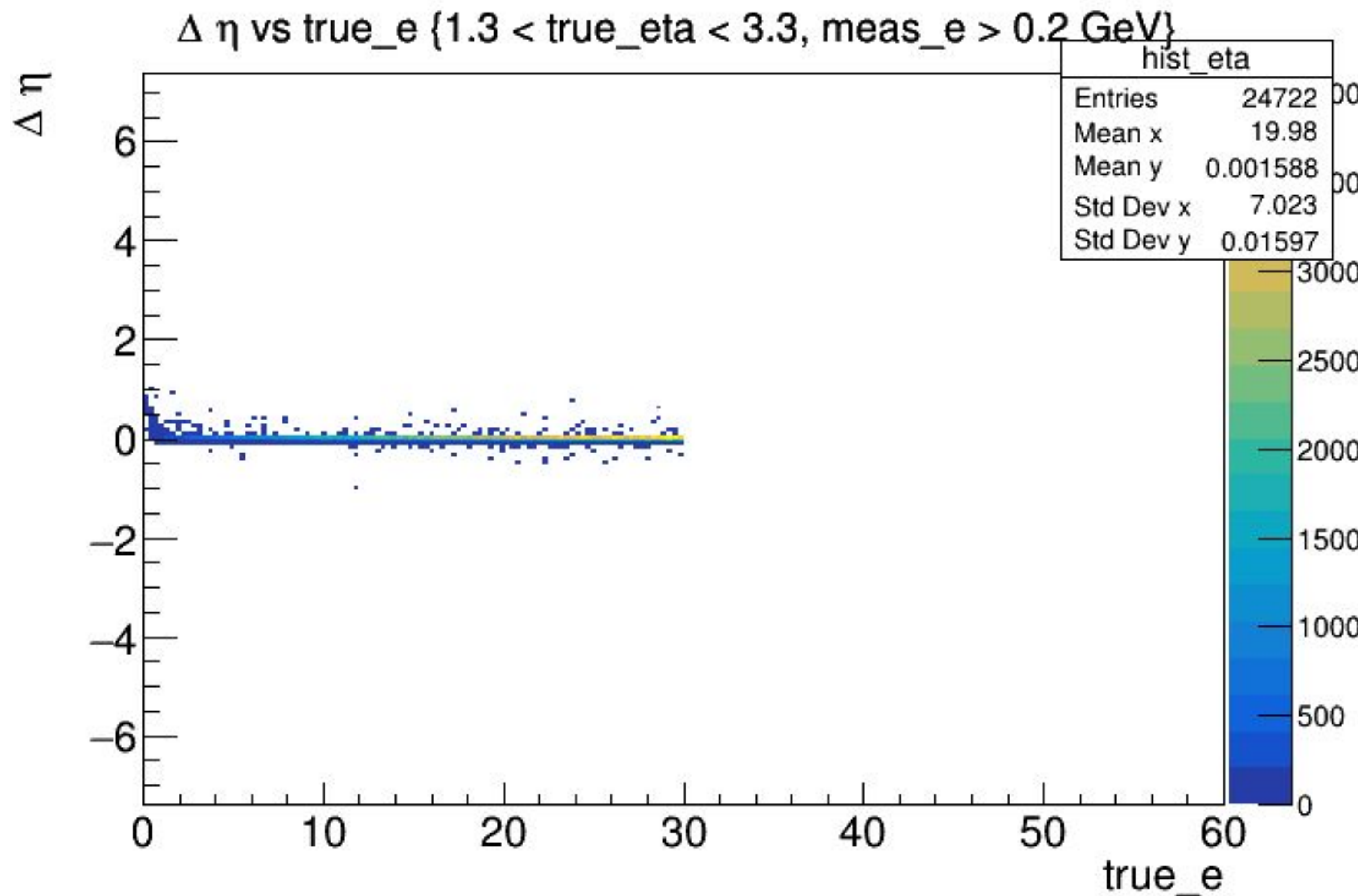
# FEMC ( $e^-$ )

$\Delta\phi$  vs  $g_e$   
Explicit  $\eta$  cut: 1.3 to 3.3  
Energy Cut: 0.2GeV



# FEMC ( $e^-$ )

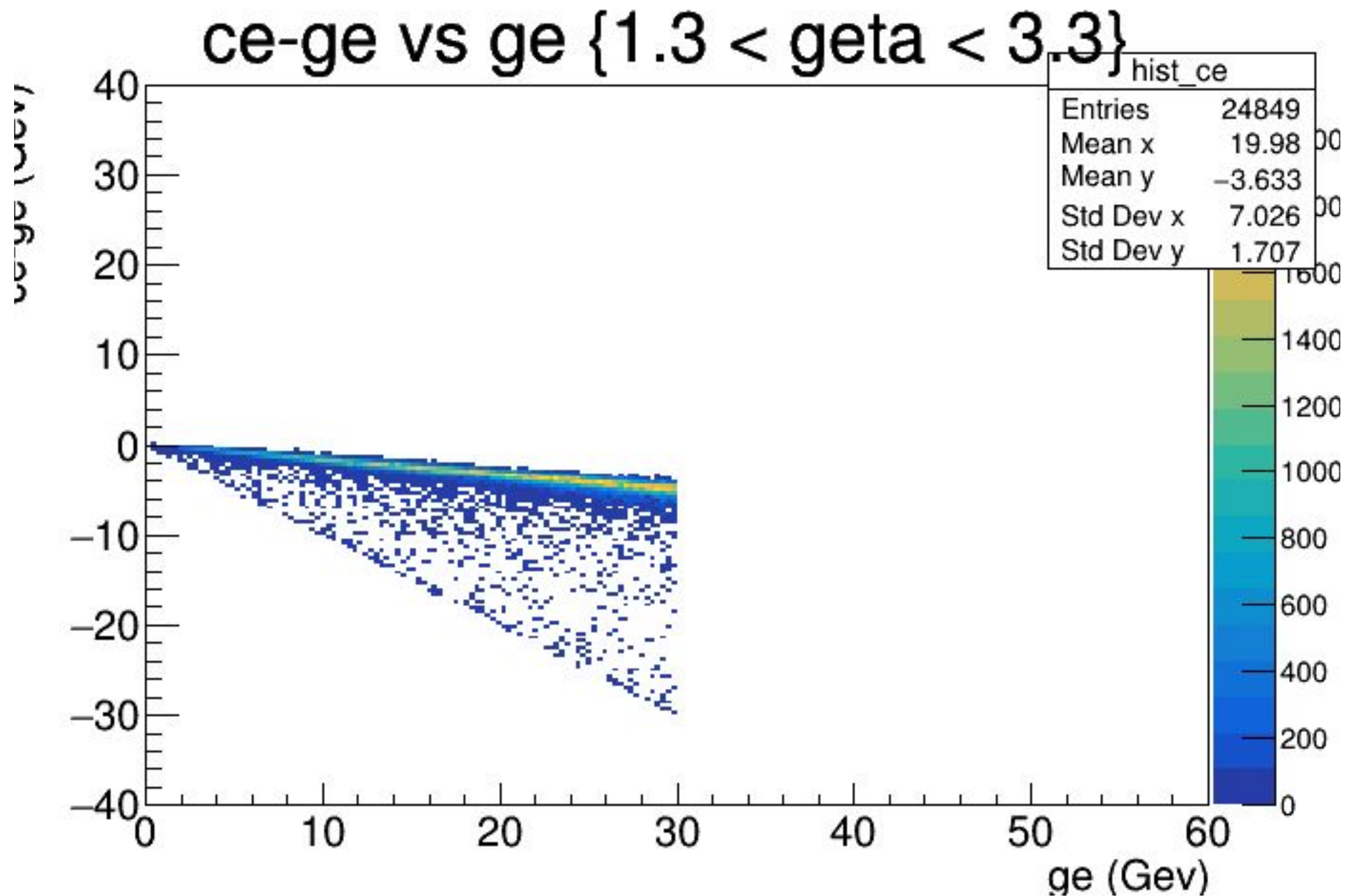
$\Delta\eta$  vs  $g_e$   
Explicit  $\eta$  cut: 1.3 to 3.3  
Energy Cut: 0.2GeV





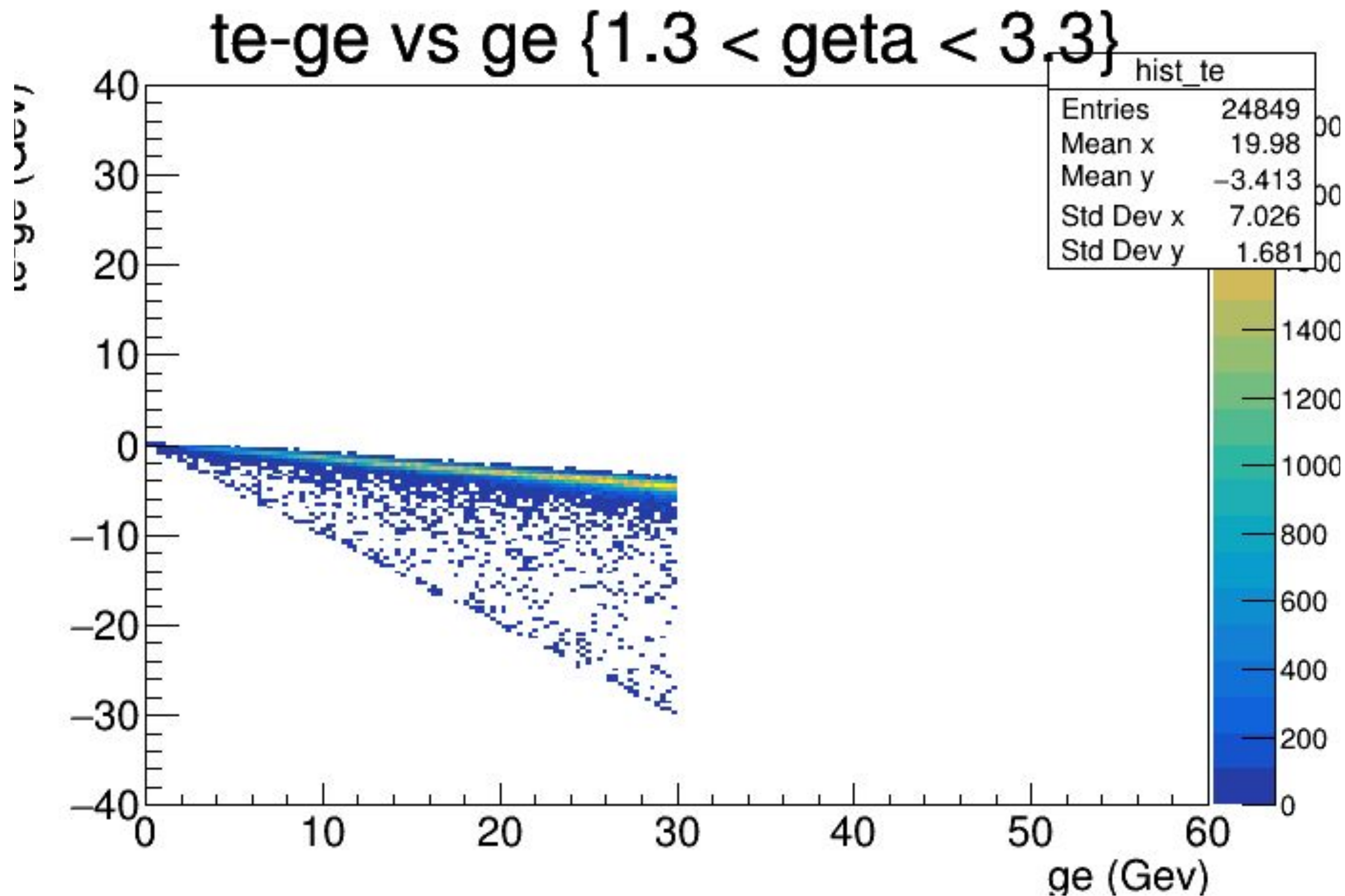
# FEMC ( $e^-$ )

(ce-ge) vs ge  
Explicit  $\eta$  cut: 1.3 to 3.3



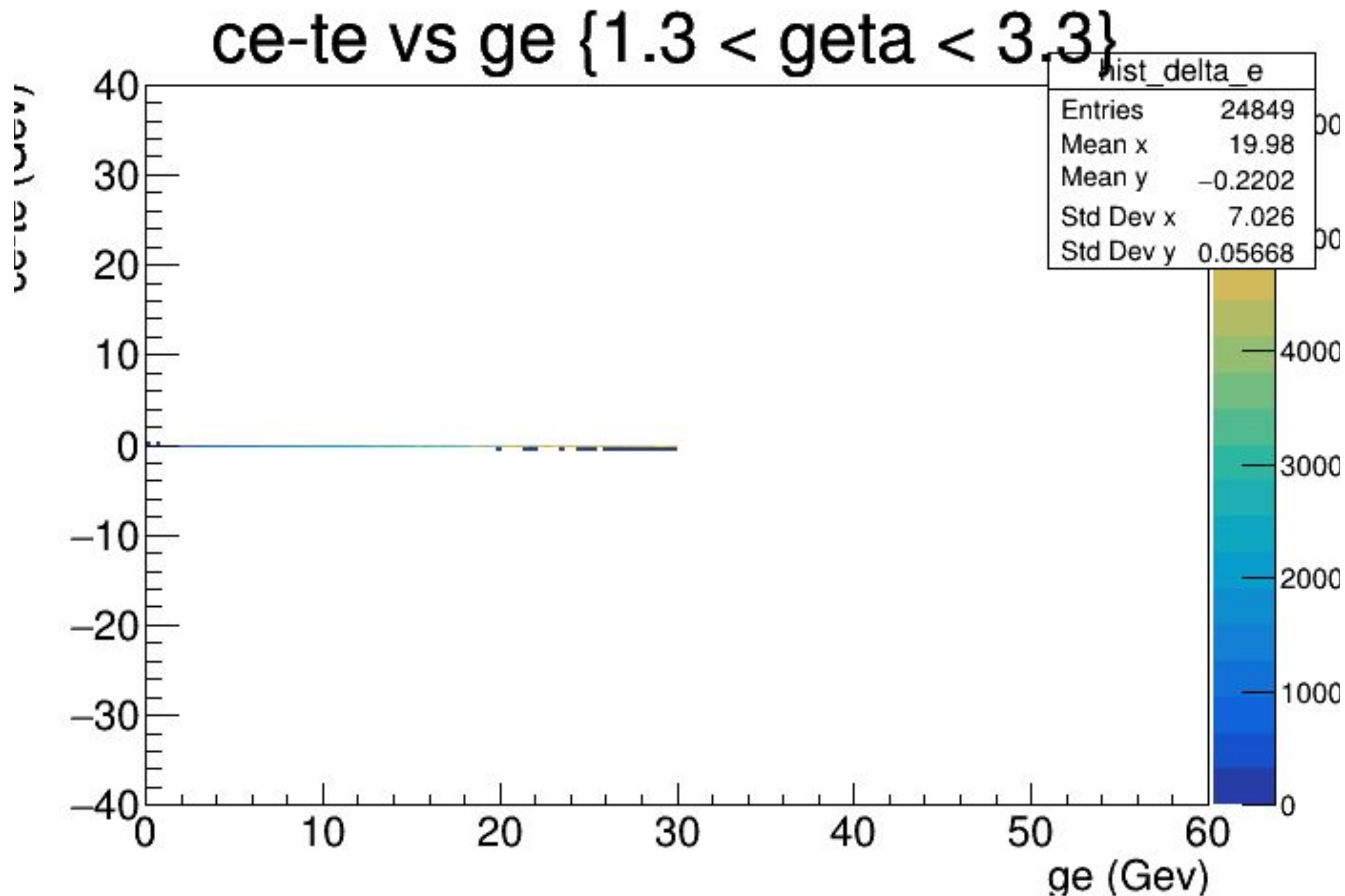
# FEMC ( $e^-$ )

( $t_e$ - $g_e$ ) vs  $g_e$   
Explicit  $\eta$  cut: 1.3 to 3.3



# FEMC ( $e^-$ )

(ce-te) vs  $g_e$   
Explicit  $\eta$  cut: 1.3 to 3.3



# FEMC ( $e^-$ )

Total Energy Counts  
Explicit  $\eta$  cut: 1.3 to 3.3

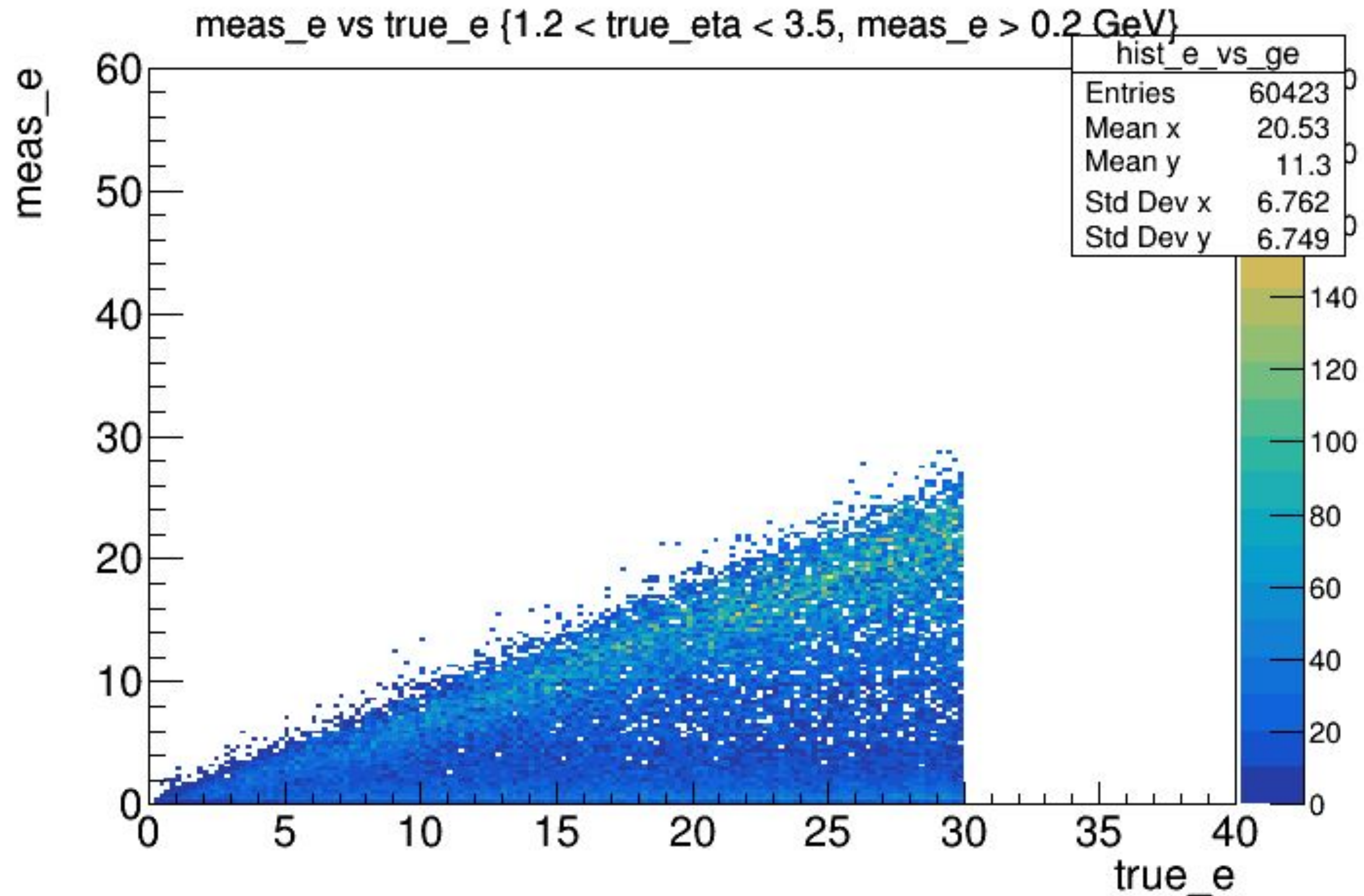
The total ce is:	308486 GeV
The total te is:	318776 GeV
The total ge is:	336252 GeV



**FHCAL**

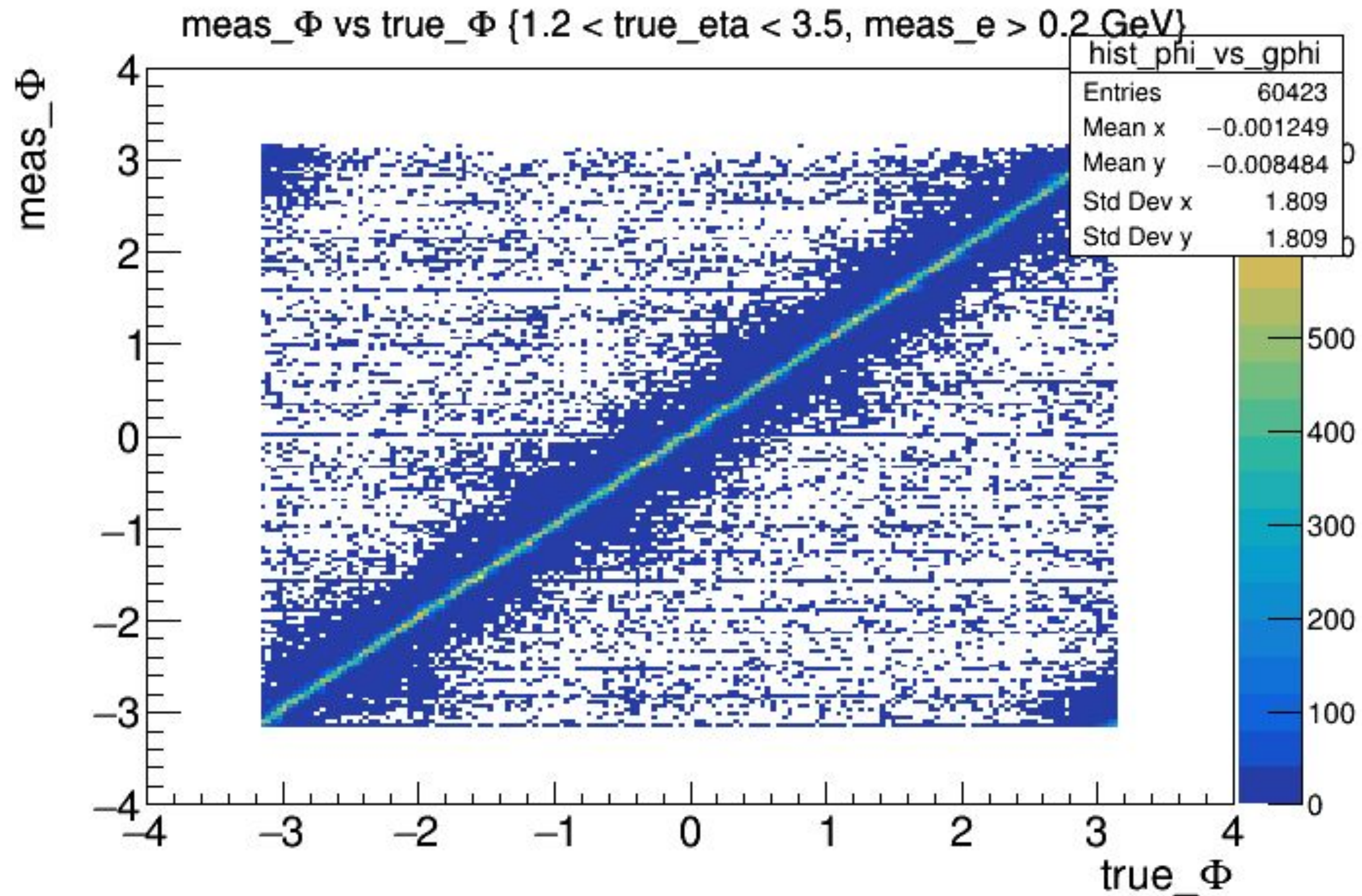
# FHCAL ( $\pi^-$ )

e vs ge  
Explicit  $\eta$  cut: 1.2 to 3.5  
Energy Cut: 0.2GeV



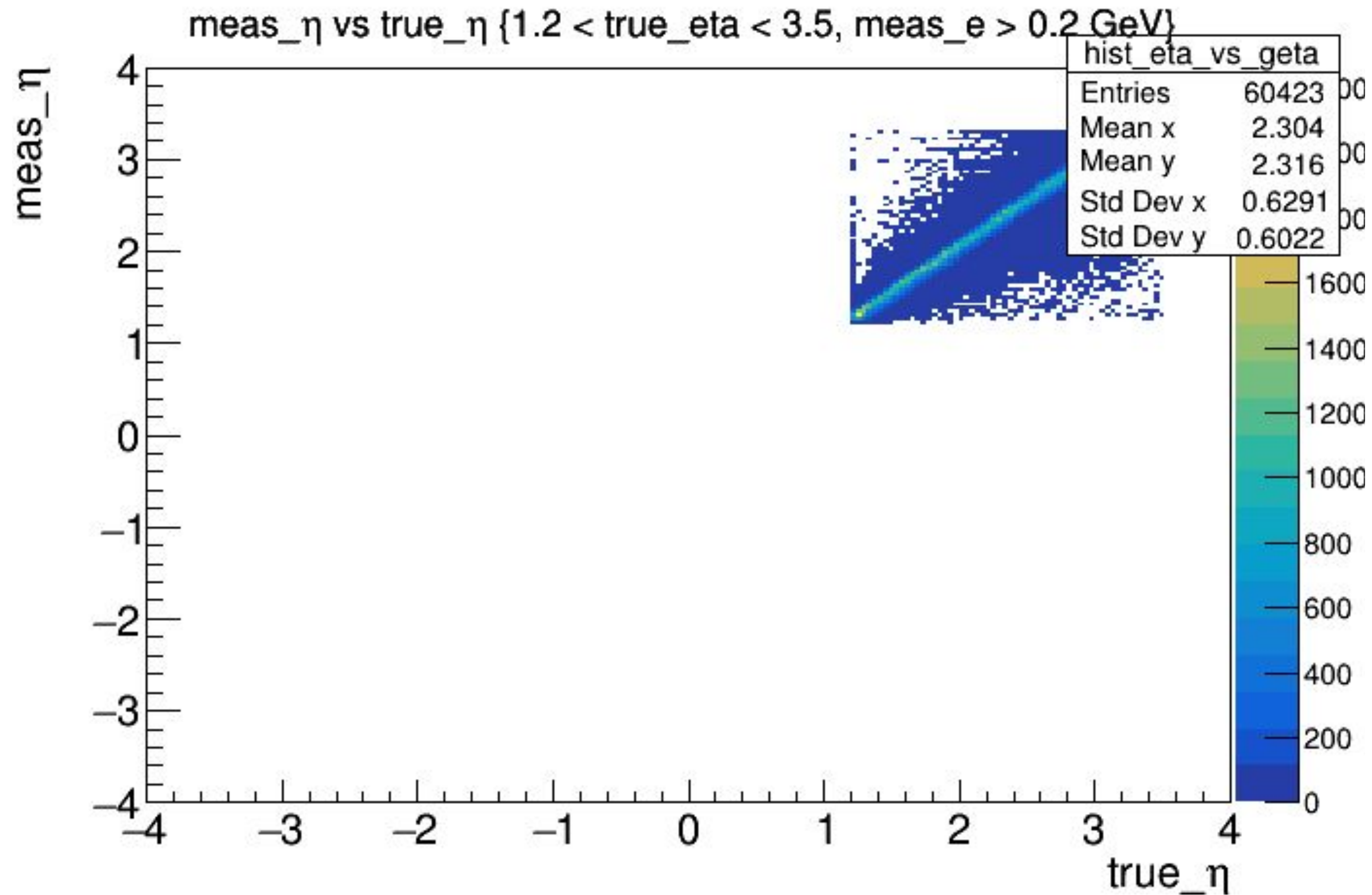
# FHCAL ( $\pi^-$ )

phi vs gphi  
Explicit  $\eta$  cut: 1.2 to 3.5  
Energy Cut: 0.2GeV



# FHCAL ( $\pi^-$ )

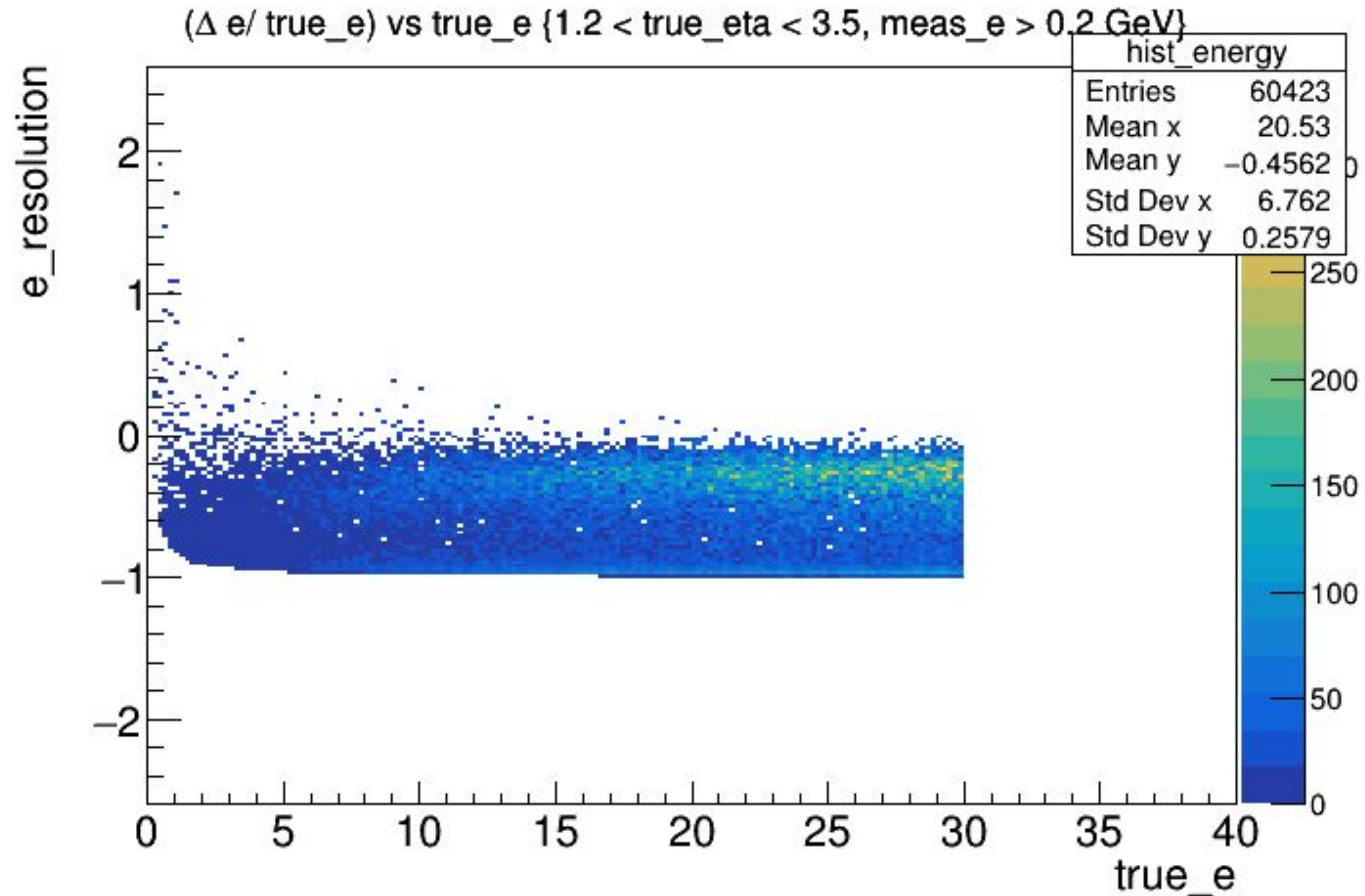
eta vs geta  
Explicit  $\eta$  cut: 1.2 to 3.5  
Energy Cut: 0.2GeV





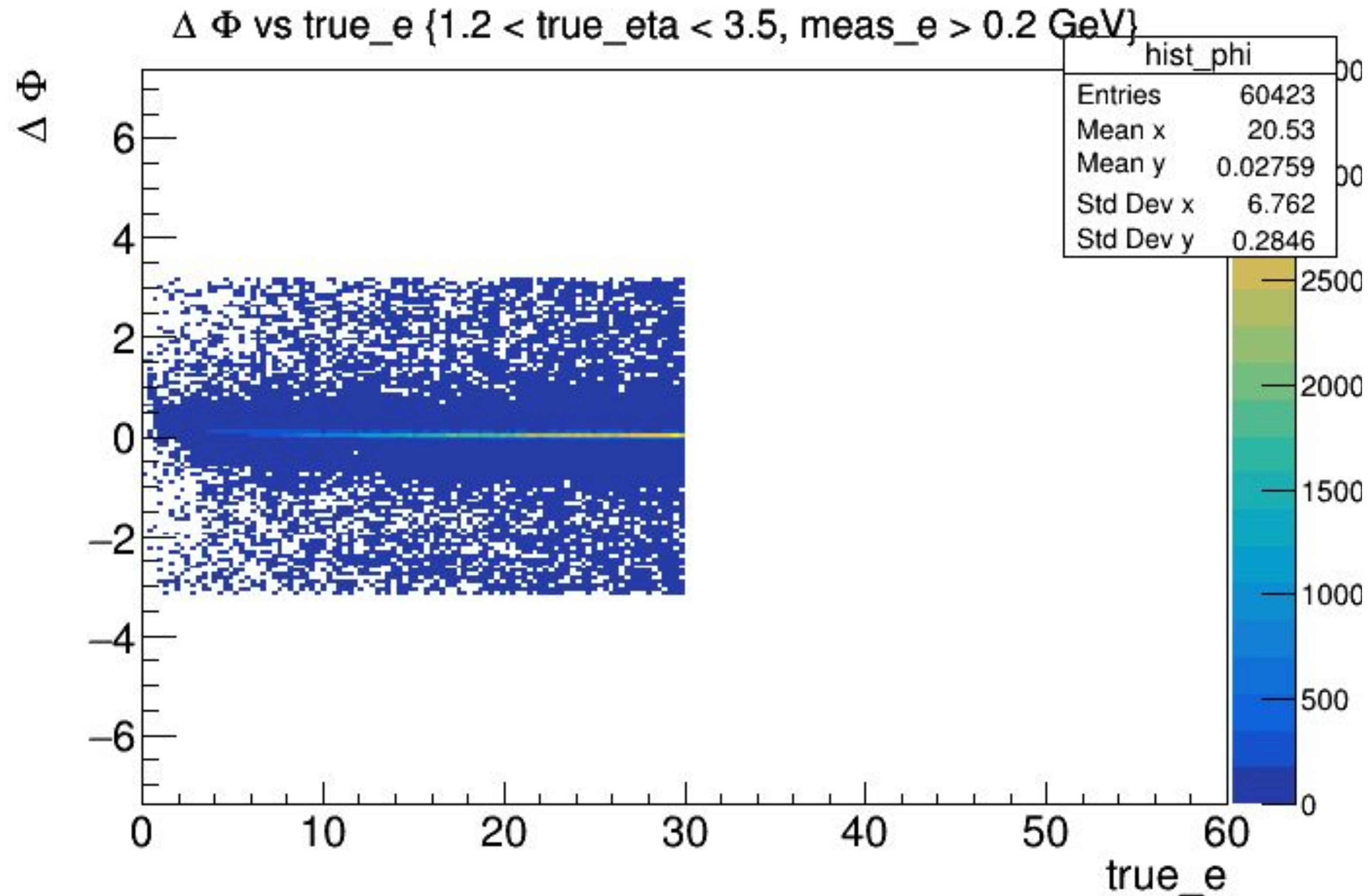
# FHCAL ( $\pi^-$ )

$\Delta e/ge$  vs  $ge$   
Explicit  $\eta$  cut: 1.2 to 3.5  
Energy Cut: 0.2GeV



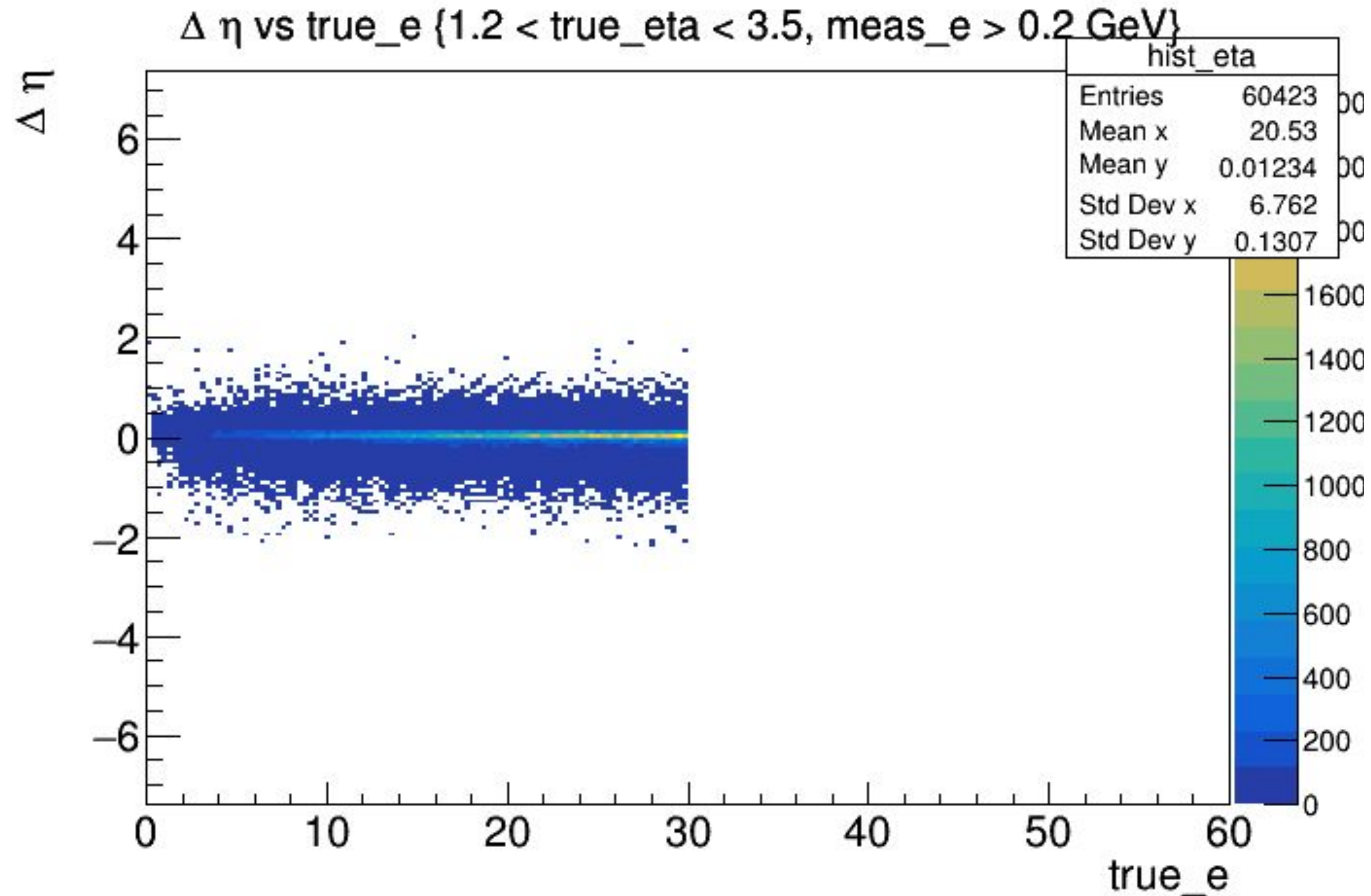
# FHCAL ( $\pi^-$ )

$\Delta\phi$  vs  $g_e$   
Explicit  $\eta$  cut: 1.2 to 3.5  
Energy Cut: 0.2 GeV



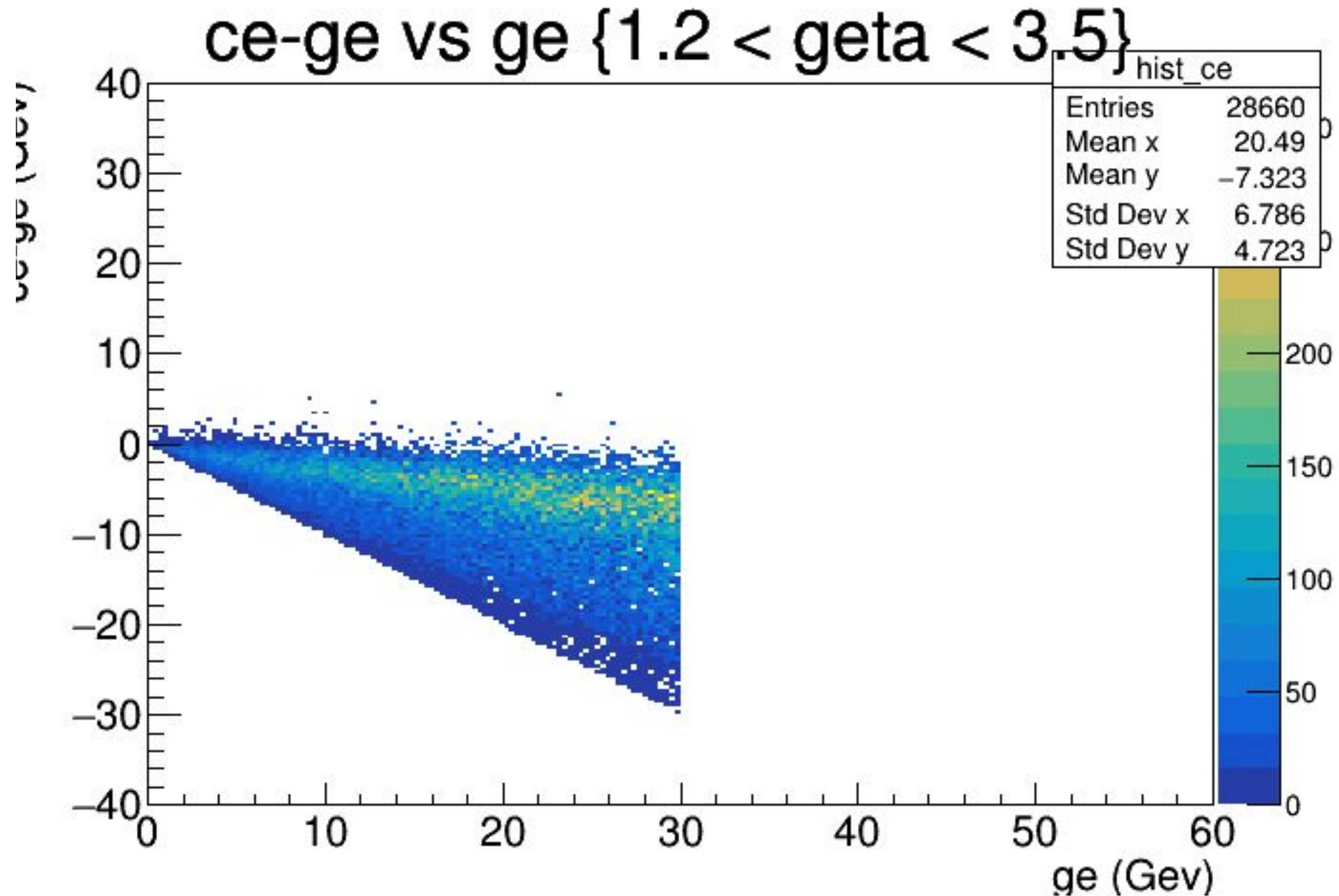
# FHCAL ( $\pi^-$ )

$\Delta\eta$  vs  $g_e$   
Explicit  $\eta$  cut: 1.2 to 3.5  
Energy Cut: 0.2GeV



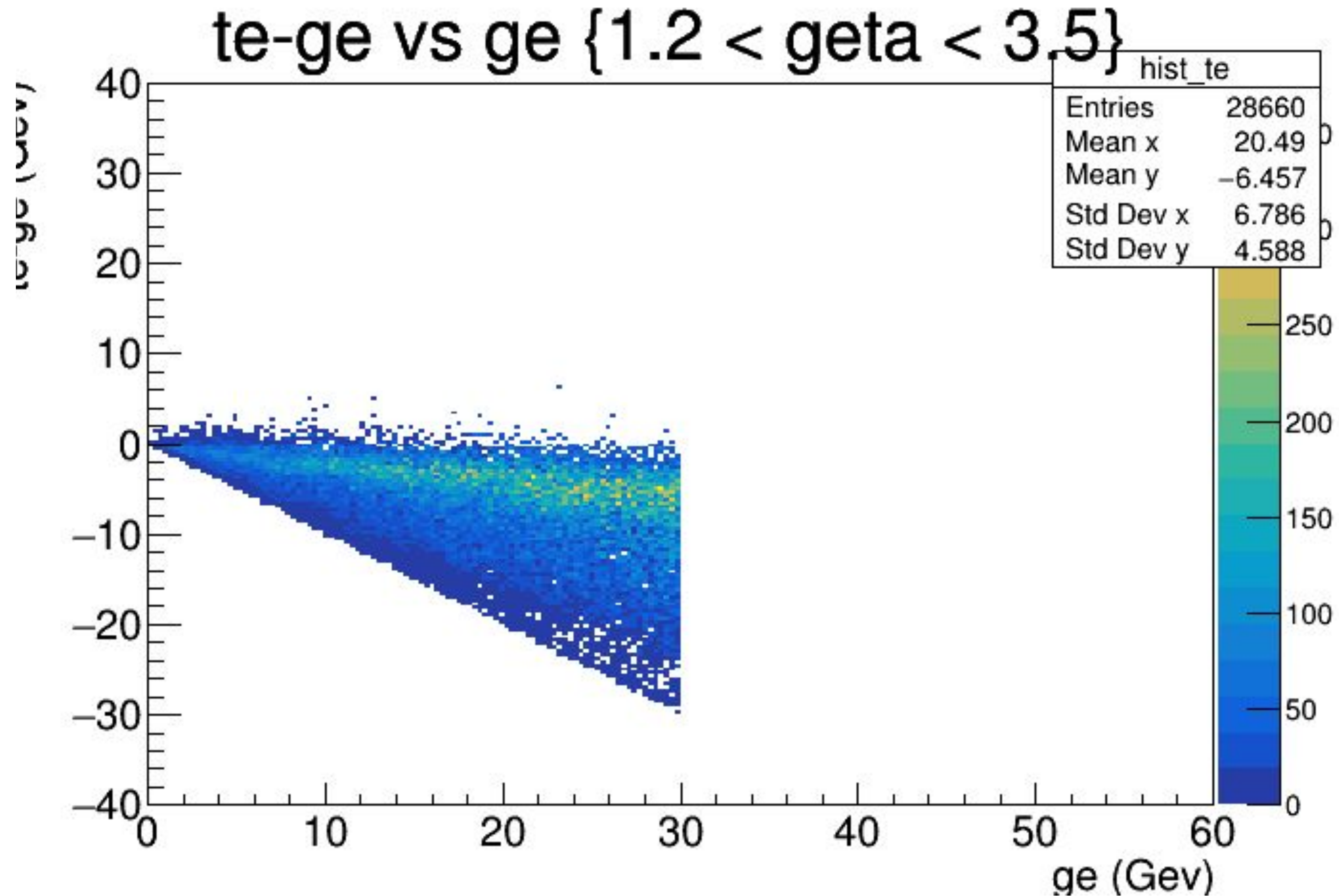
# FHCAL ( $\pi^-$ )

(ce-ge) vs ge  
Explicit  $\eta$  cut: 1.2 to 3.5



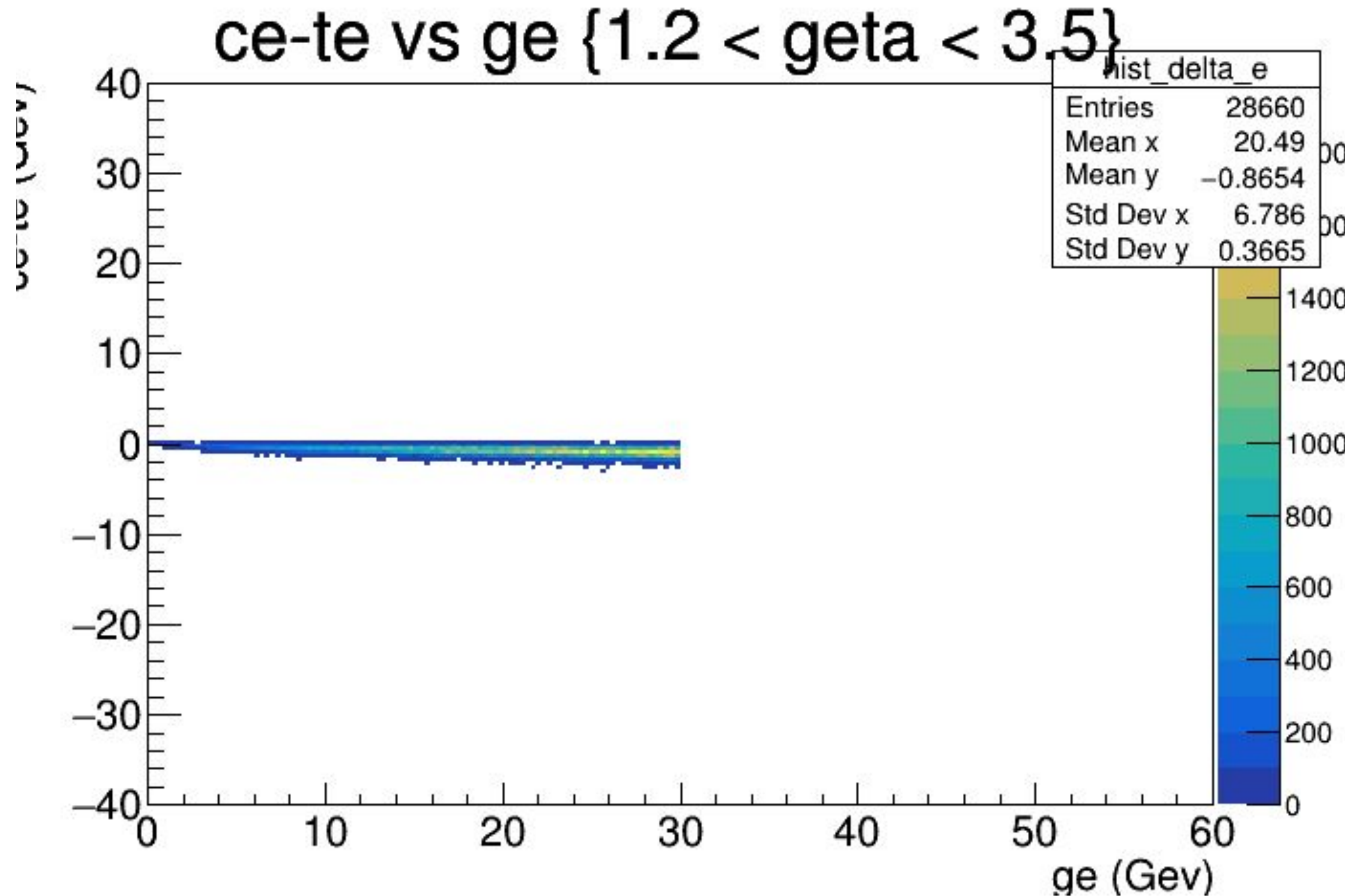
# FHCAL ( $\pi^-$ )

(te-ge) vs ge  
Explicit  $\eta$  cut: 1.2 to 3.5



# FHCAL ( $\pi^-$ )

(ce-te) vs ge  
Explicit  $\eta$  cut: 1.2 to 3.5



# FHCAL

## ( $\pi^-$ )

Total Energy Counts  
Explicit  $\eta$  cut: 1.2 to 3.5

The total ce is:

211896 GeV

The total te is:

231138 GeV

The total ge is:

428538 GeV

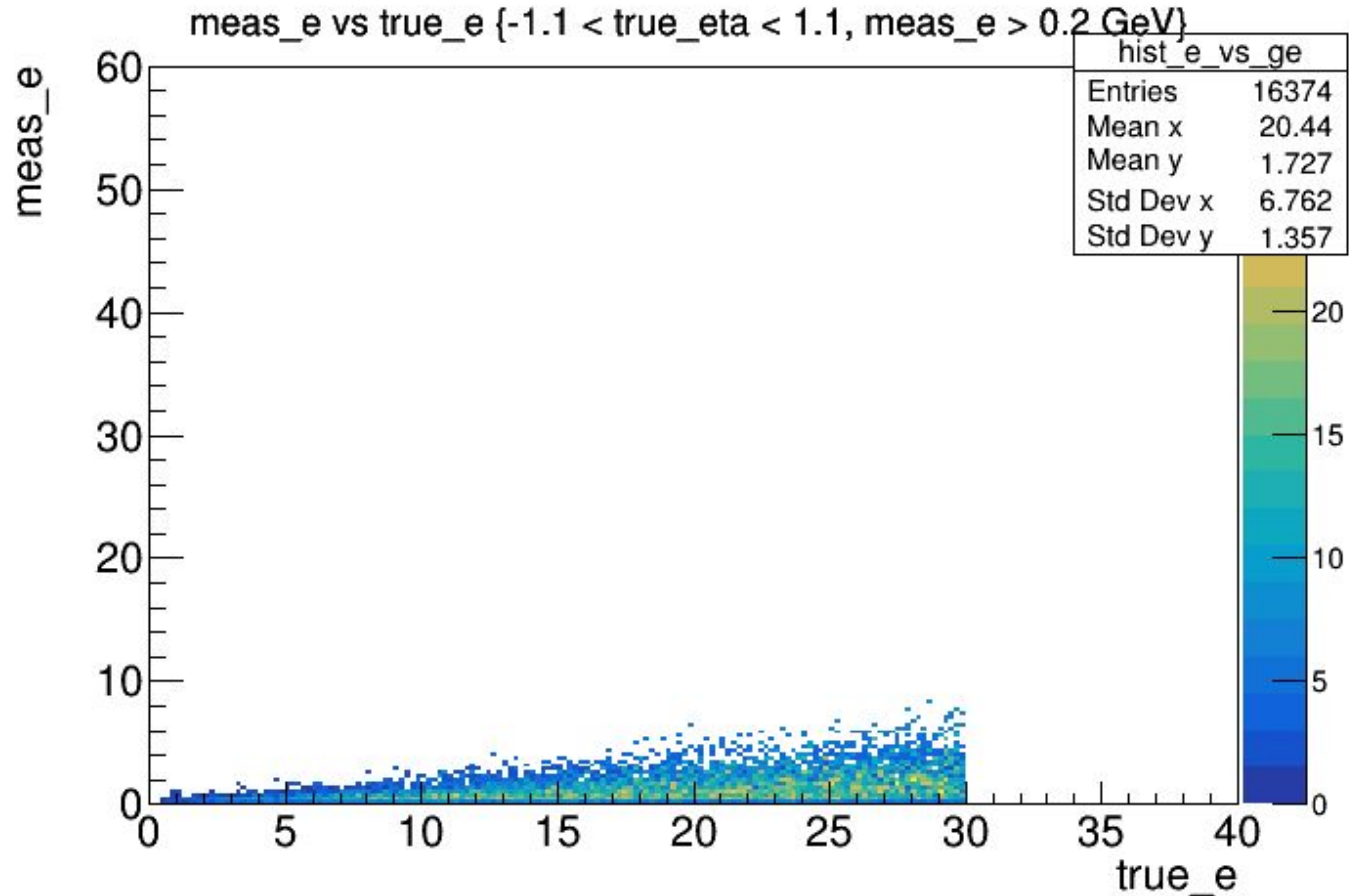


**HCALIN**



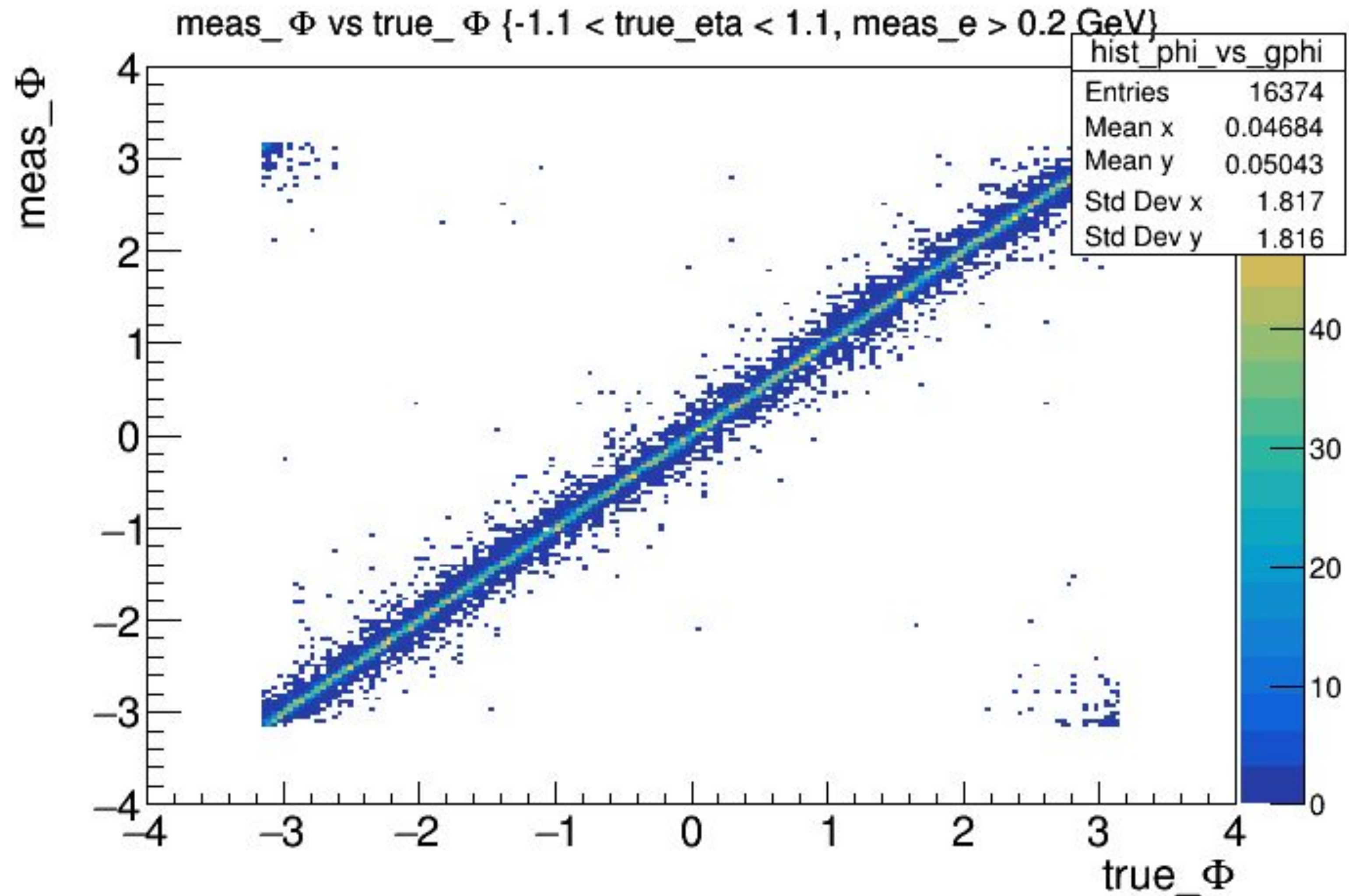
# HCALIN ( $\pi^-$ )

e vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



# HCALIN ( $\pi^-$ )

phi vs gphi  
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV

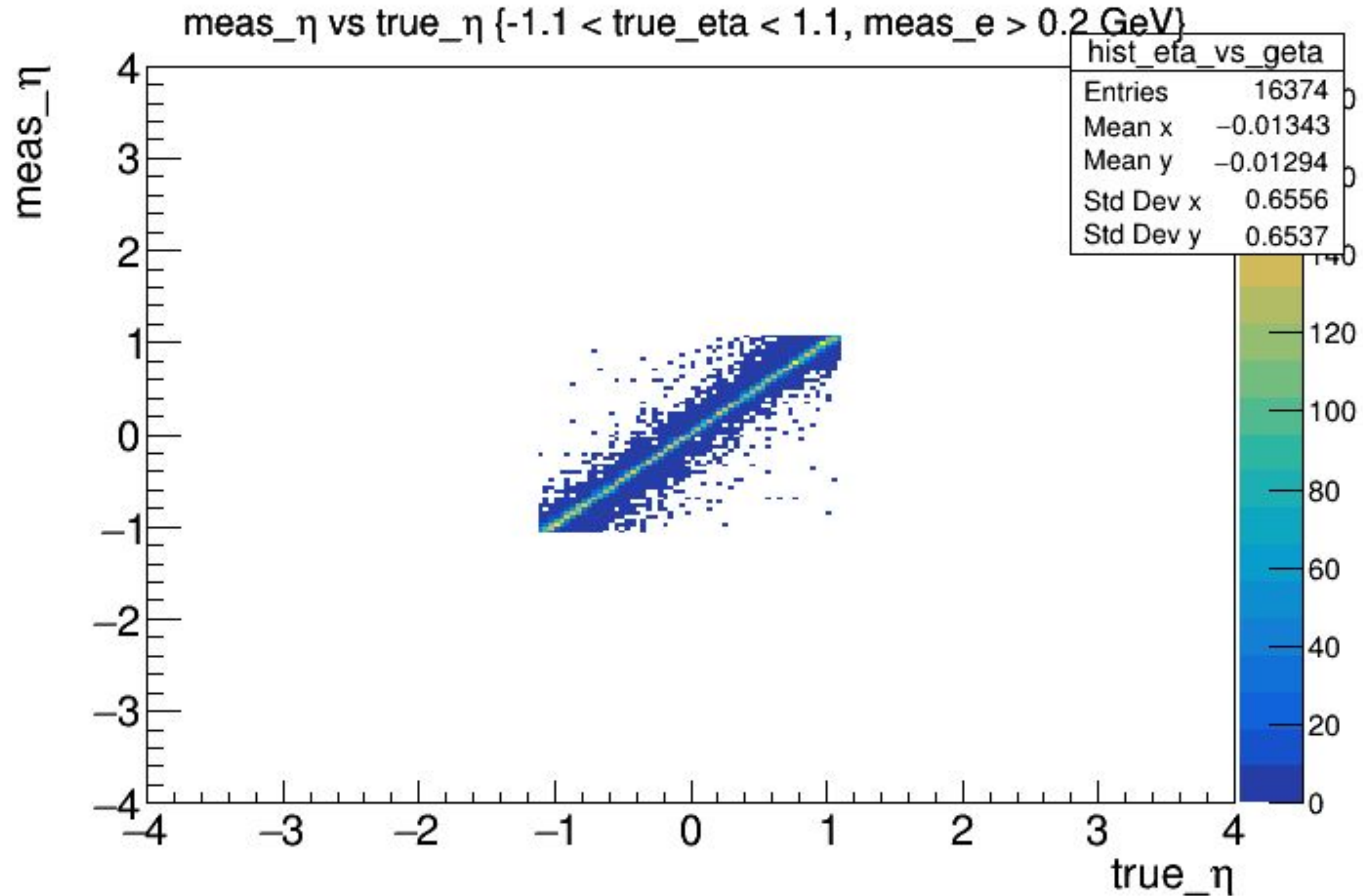


# HCALIN ( $\pi^-$ )

eta vs geta

Explicit  $\eta$  cut: -1.1 to 1.1

Energy Cut: 0.2GeV

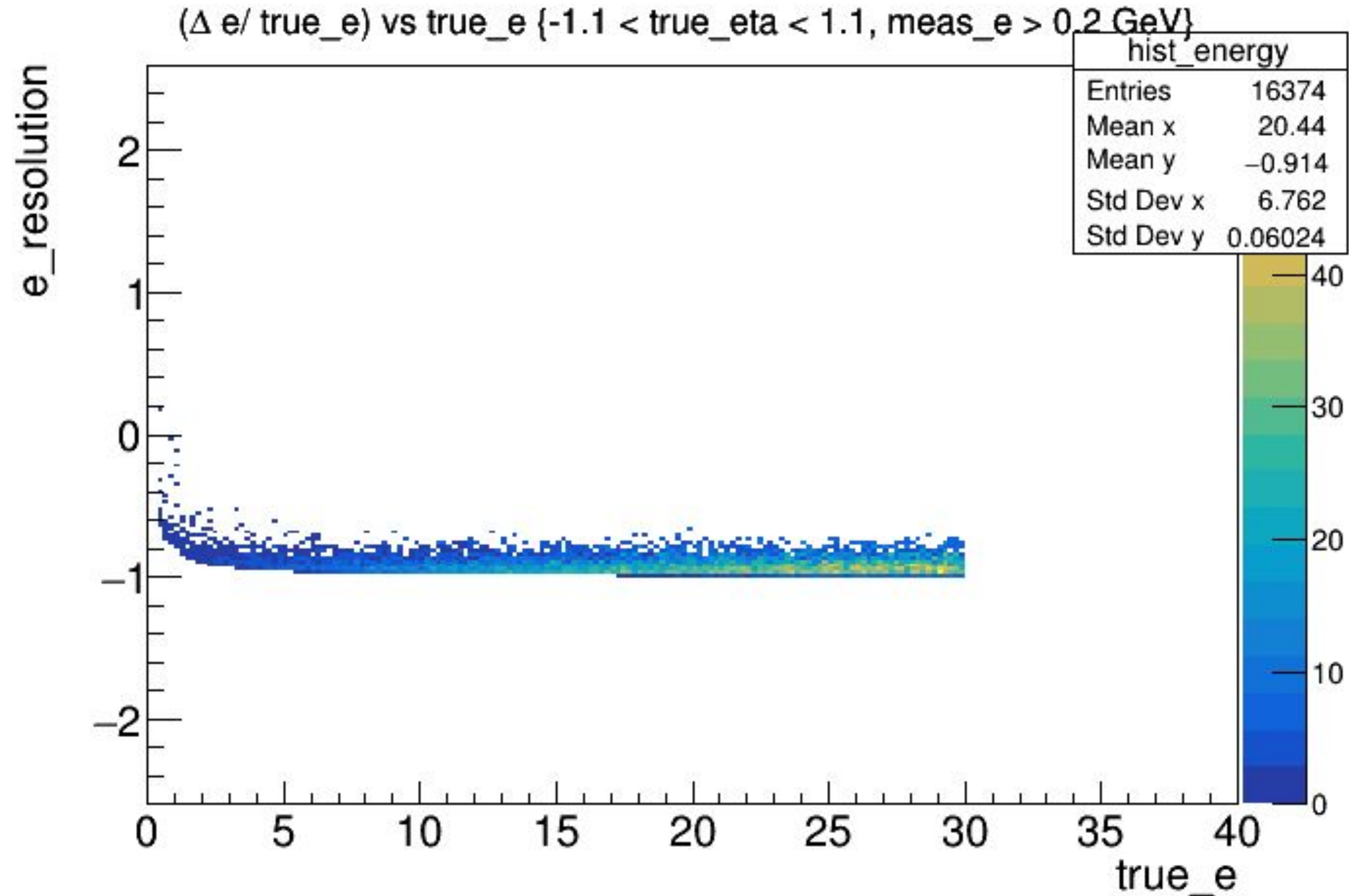


# HCALIN ( $\pi^-$ )

$\Delta e/ge$  vs  $ge$

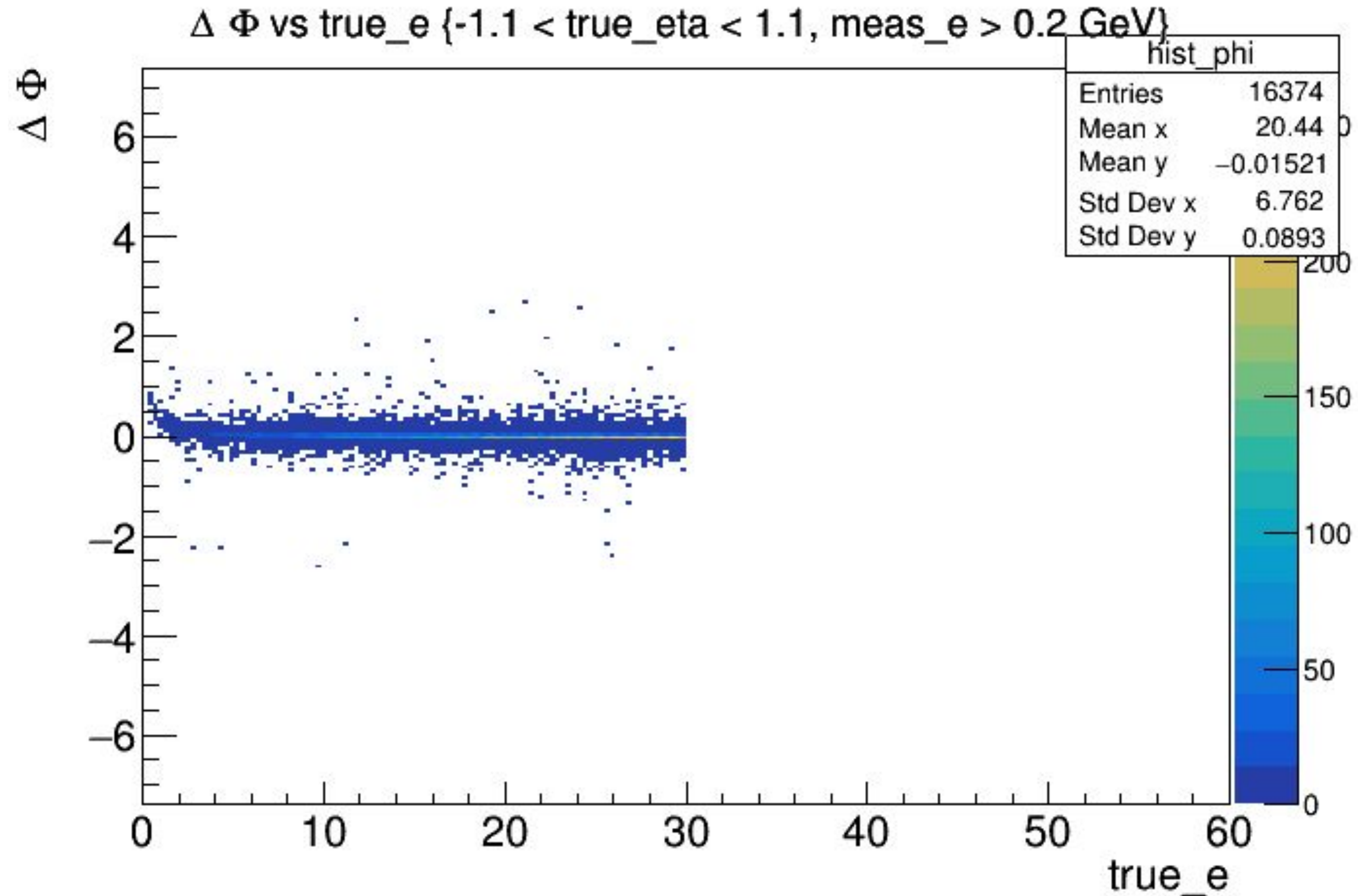
Explicit  $\eta$  cut: -1.1 to 1.1

Energy Cut: 0.2GeV



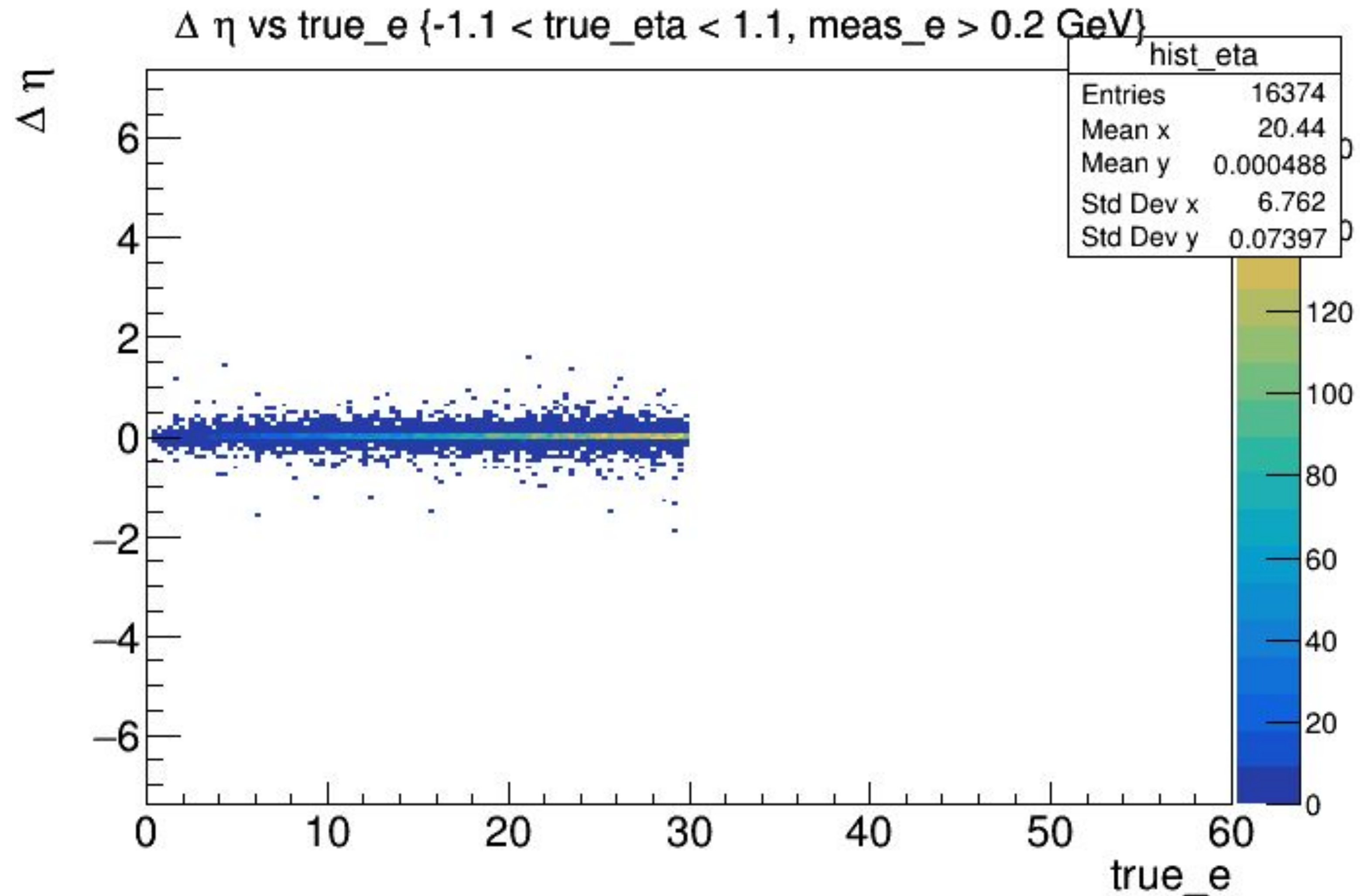
# HCALIN ( $\pi^-$ )

$\Delta\phi$  vs  $g_e$   
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2 GeV



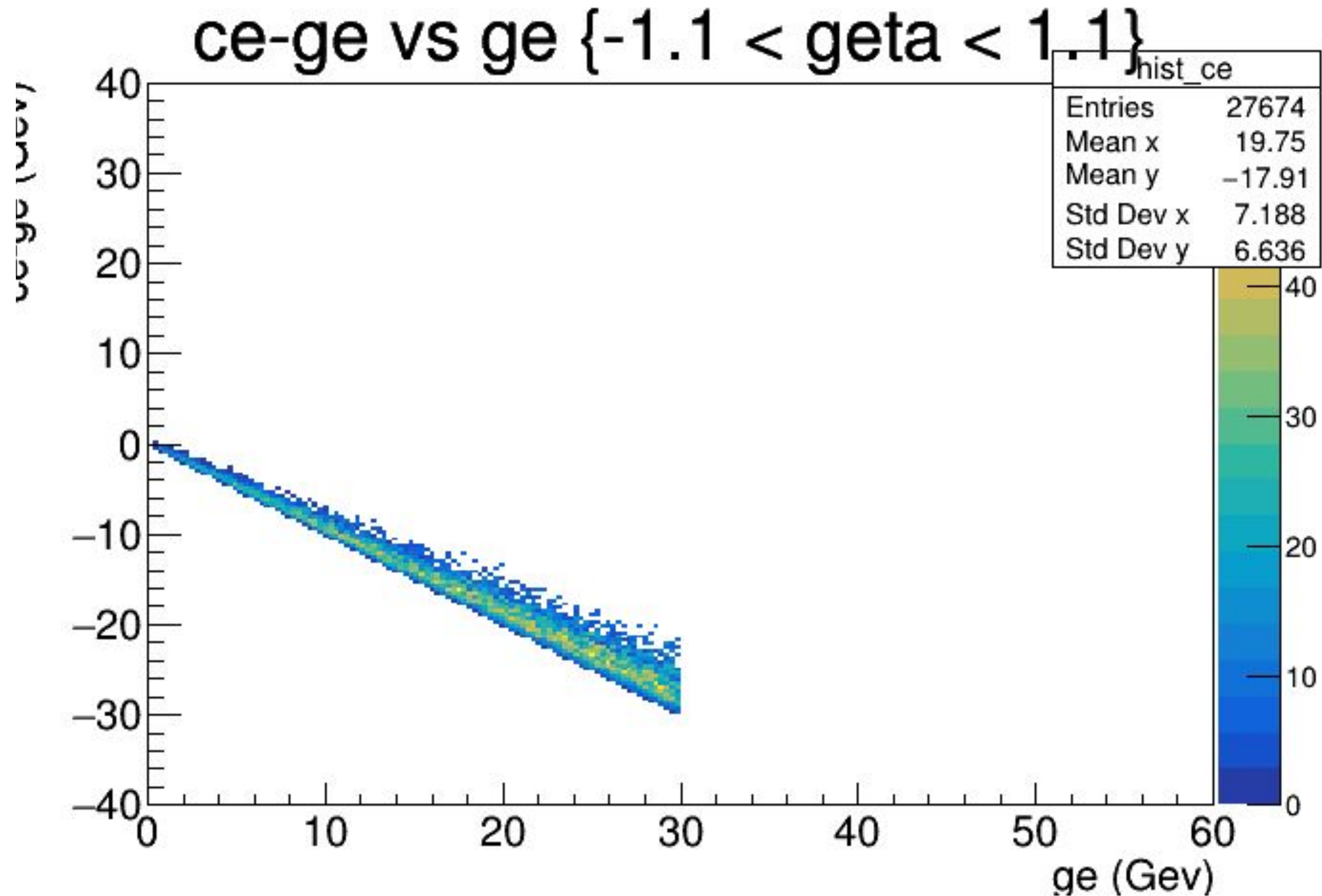
# HCALIN ( $\pi^-$ )

$\Delta\eta$  vs  $g_e$   
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



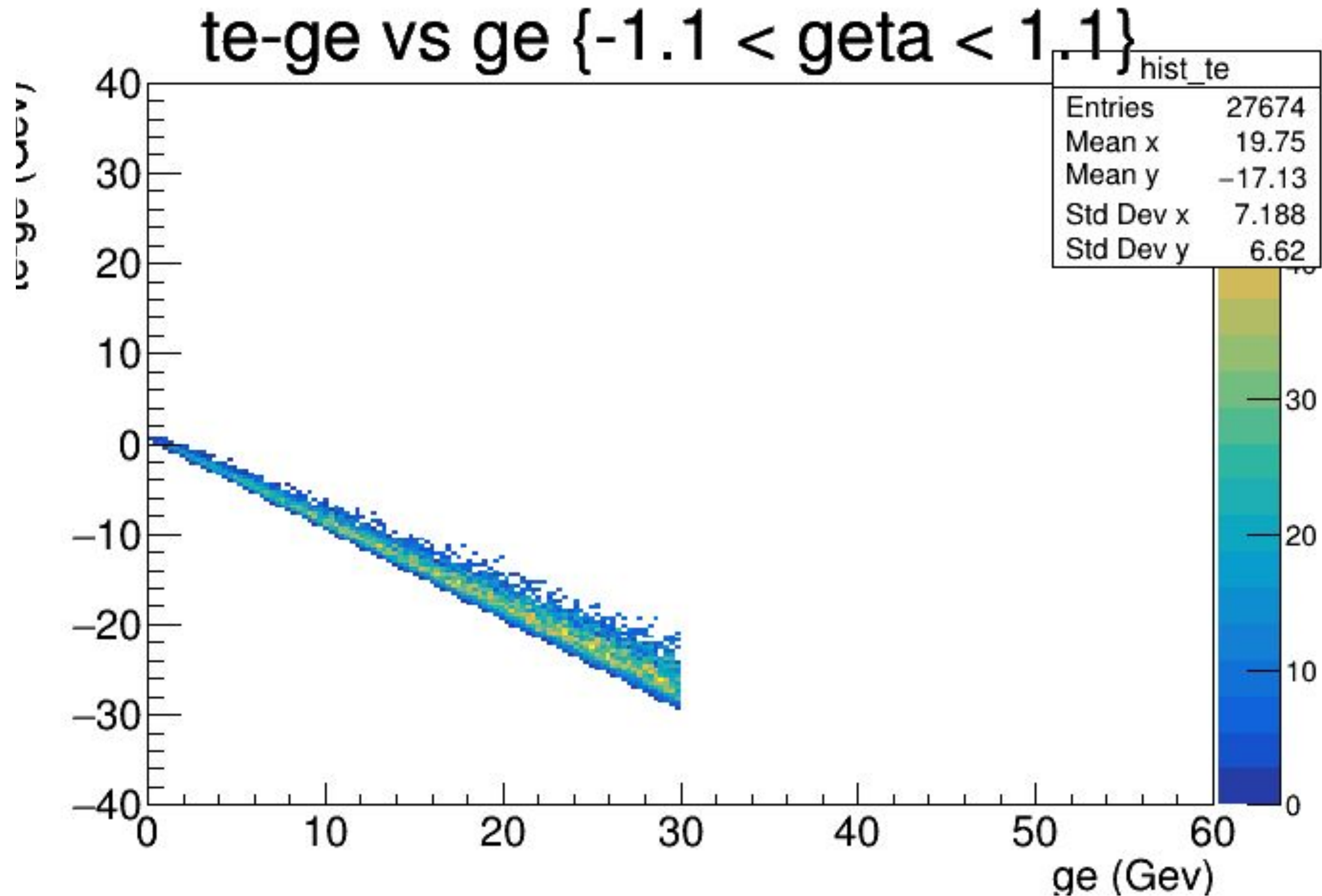
# HCALIN ( $\pi^-$ )

(ce-ge) vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1



# HCALIN ( $\pi^-$ )

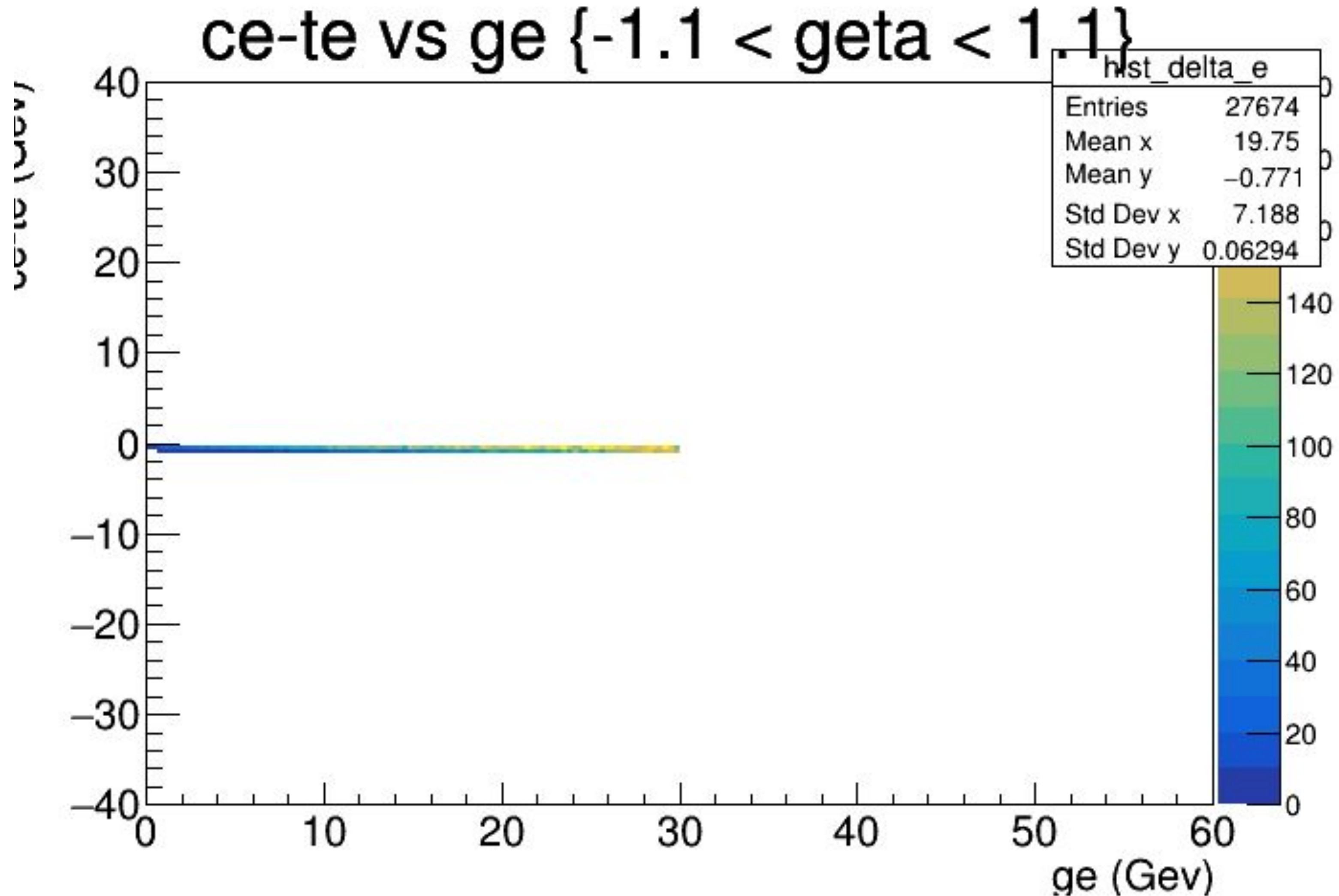
(te-ge) vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1





# HCALIN ( $\pi^-$ )

(ce-te) vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1



# HCALIN ( $\pi^-$ )

Total Energy Counts  
Explicit  $\eta$  cut: -1.1 to 1.1

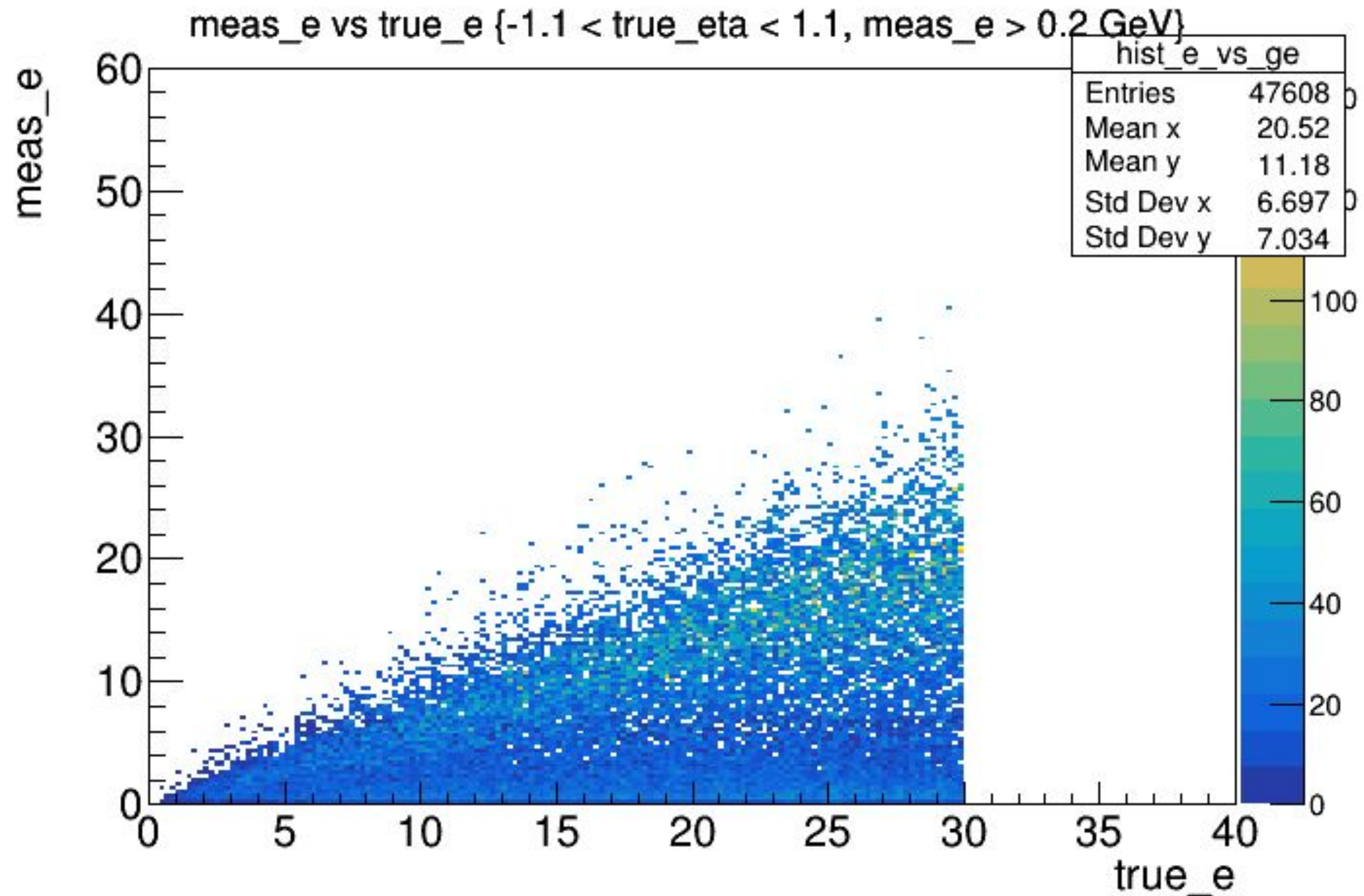
The total ce is:	16842.3	GeV
The total te is:	37116.9	GeV
The total ge is:	414236	GeV



**HCAALOUT**

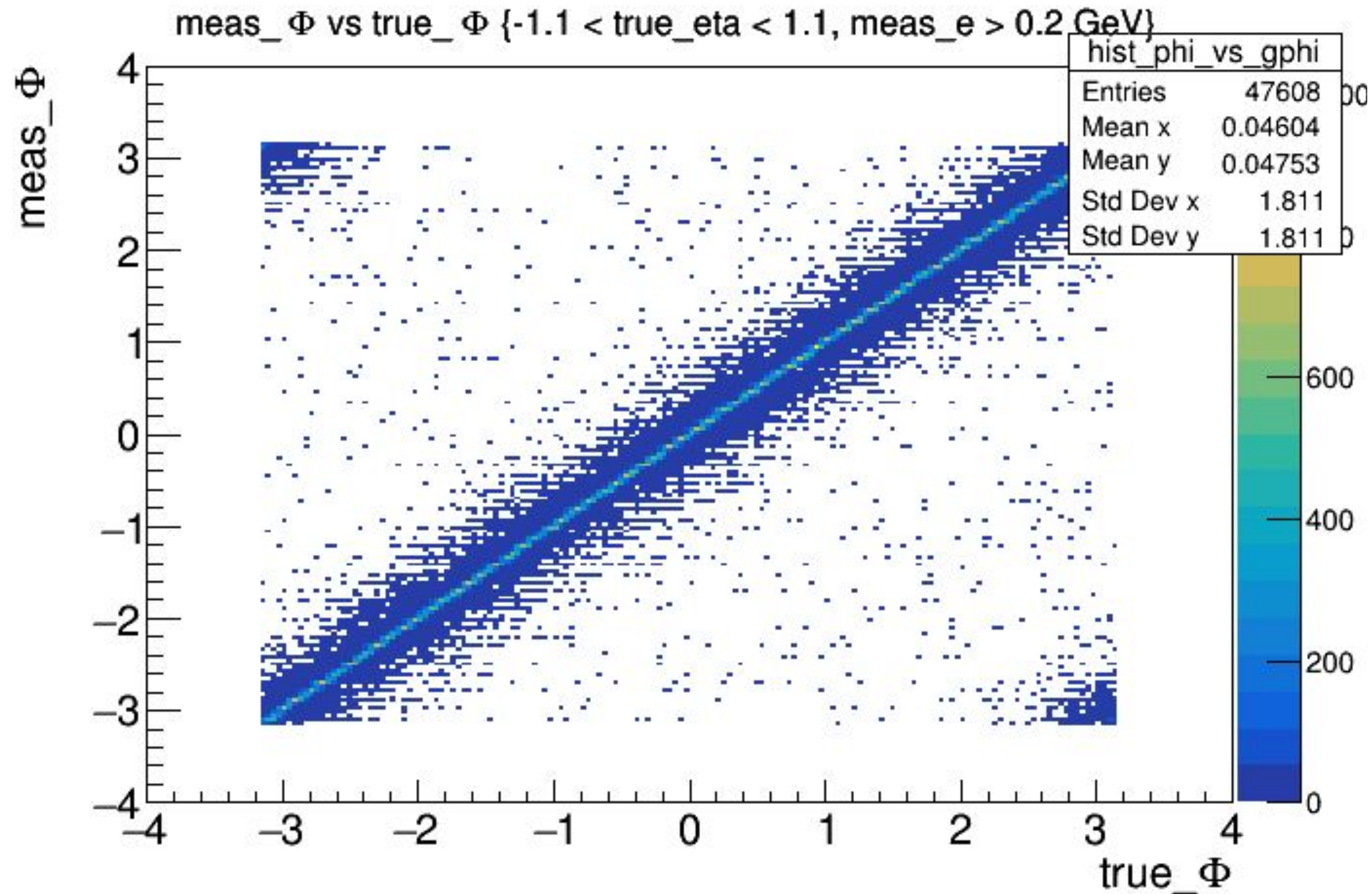
# HCALOUT ( $\pi^-$ )

e vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



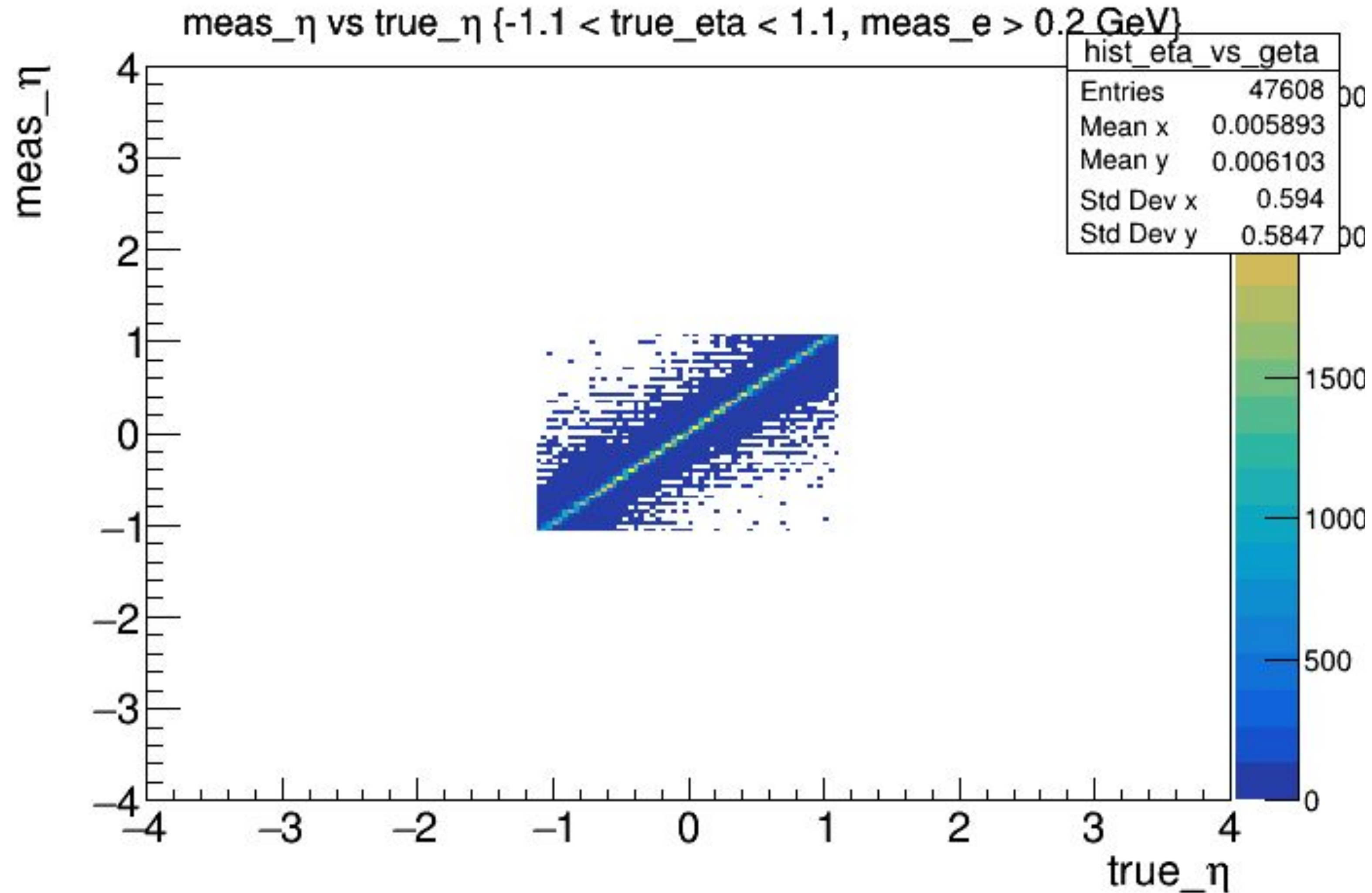
# HCALOUT ( $\pi^-$ )

phi vs gphi  
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



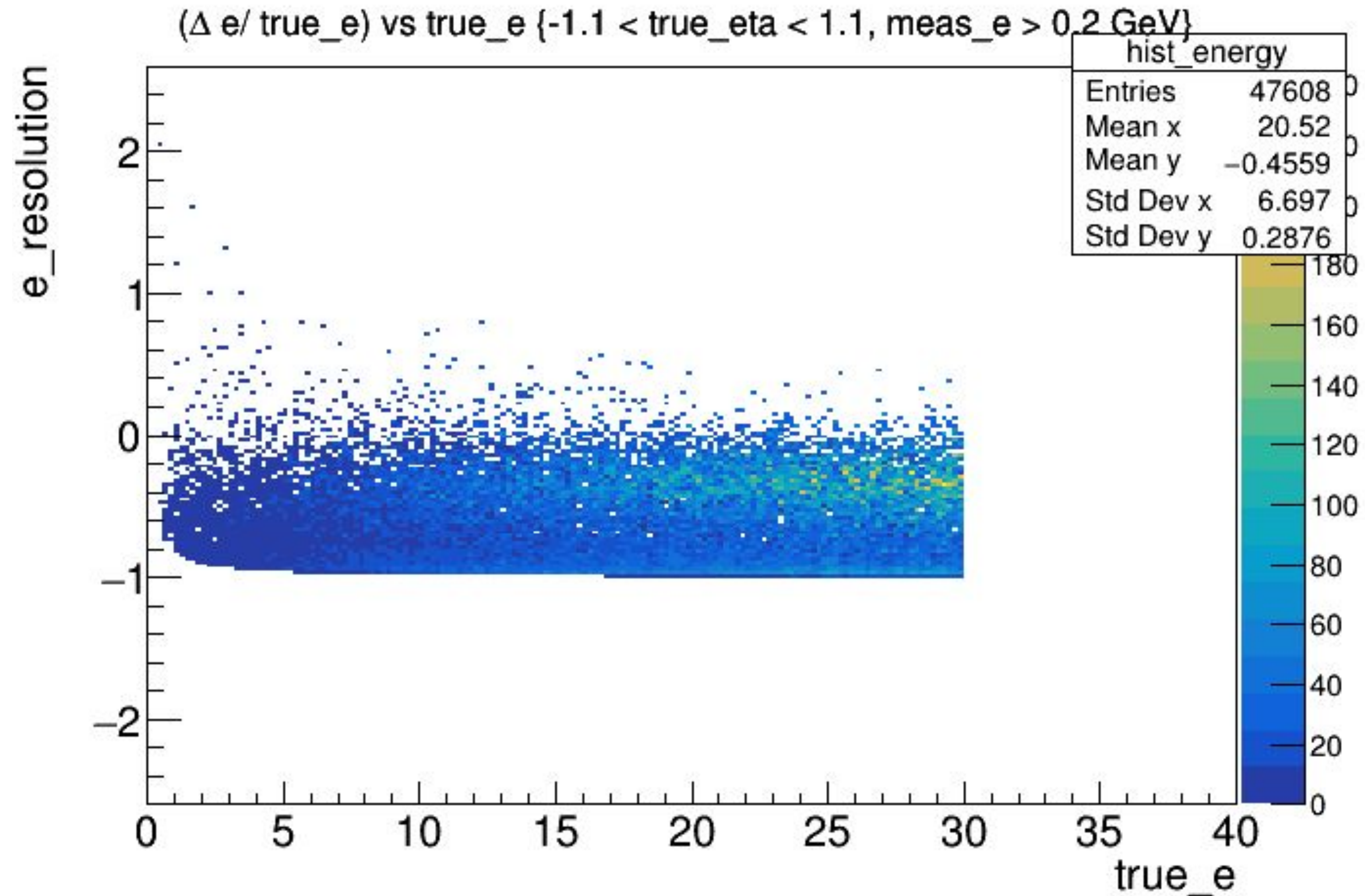
# HCALOUT ( $\pi^-$ )

eta vs geta  
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



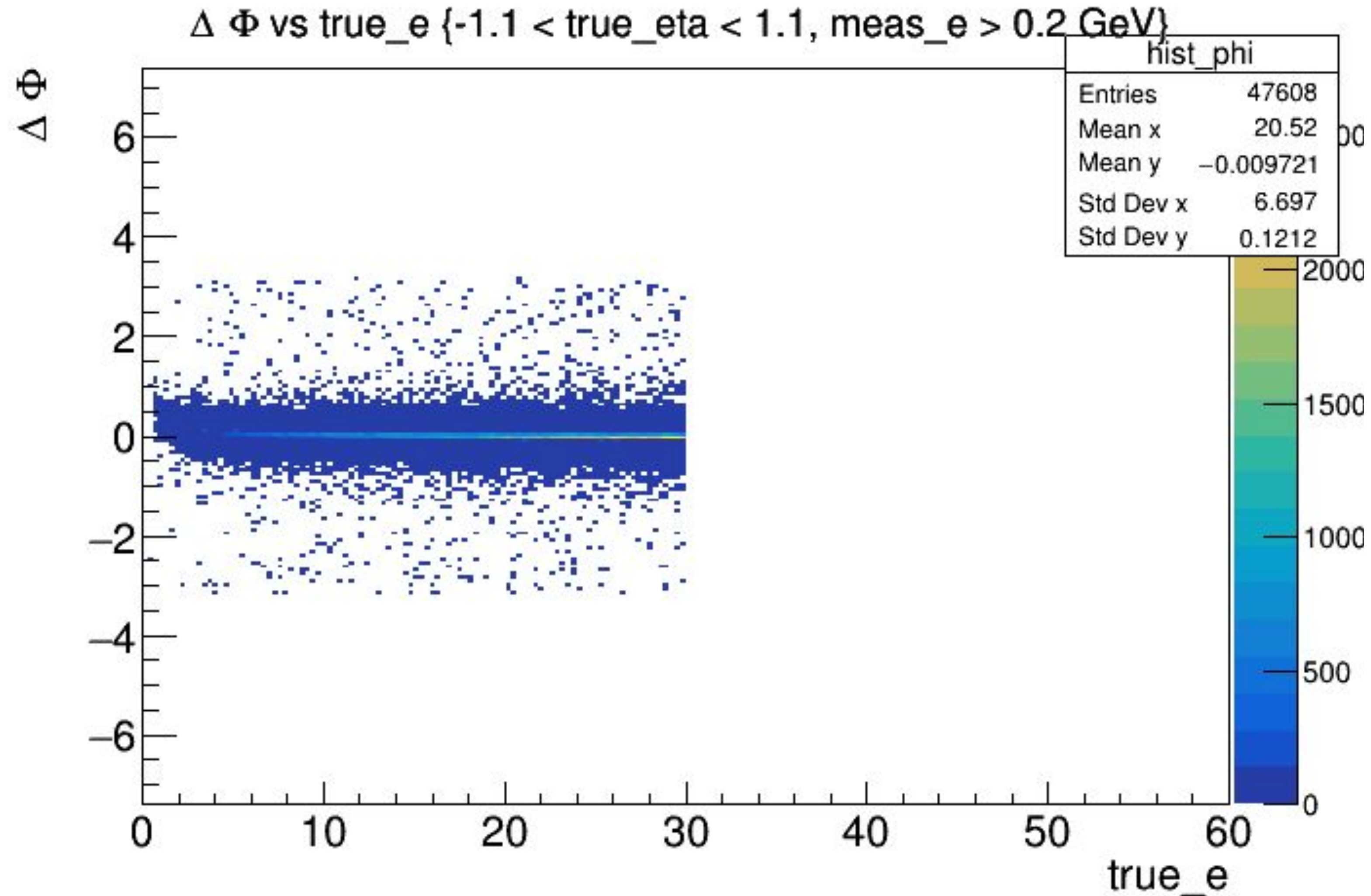
# HCALOUT ( $\pi^-$ )

$\Delta e/ge$  vs  $ge$   
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



# HCALOUT ( $\pi^-$ )

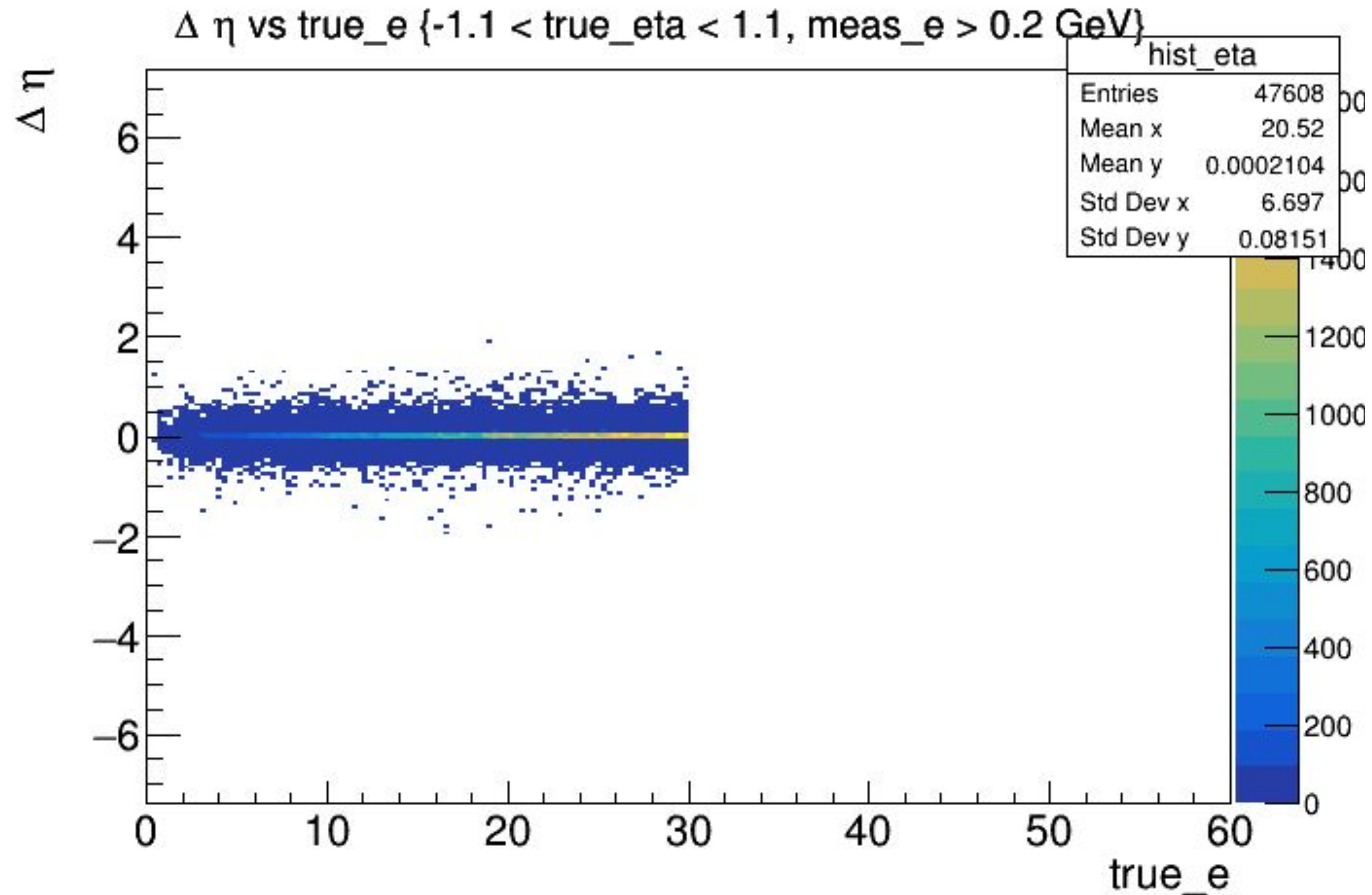
$\Delta\phi$  vs  $g_e$   
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2 GeV





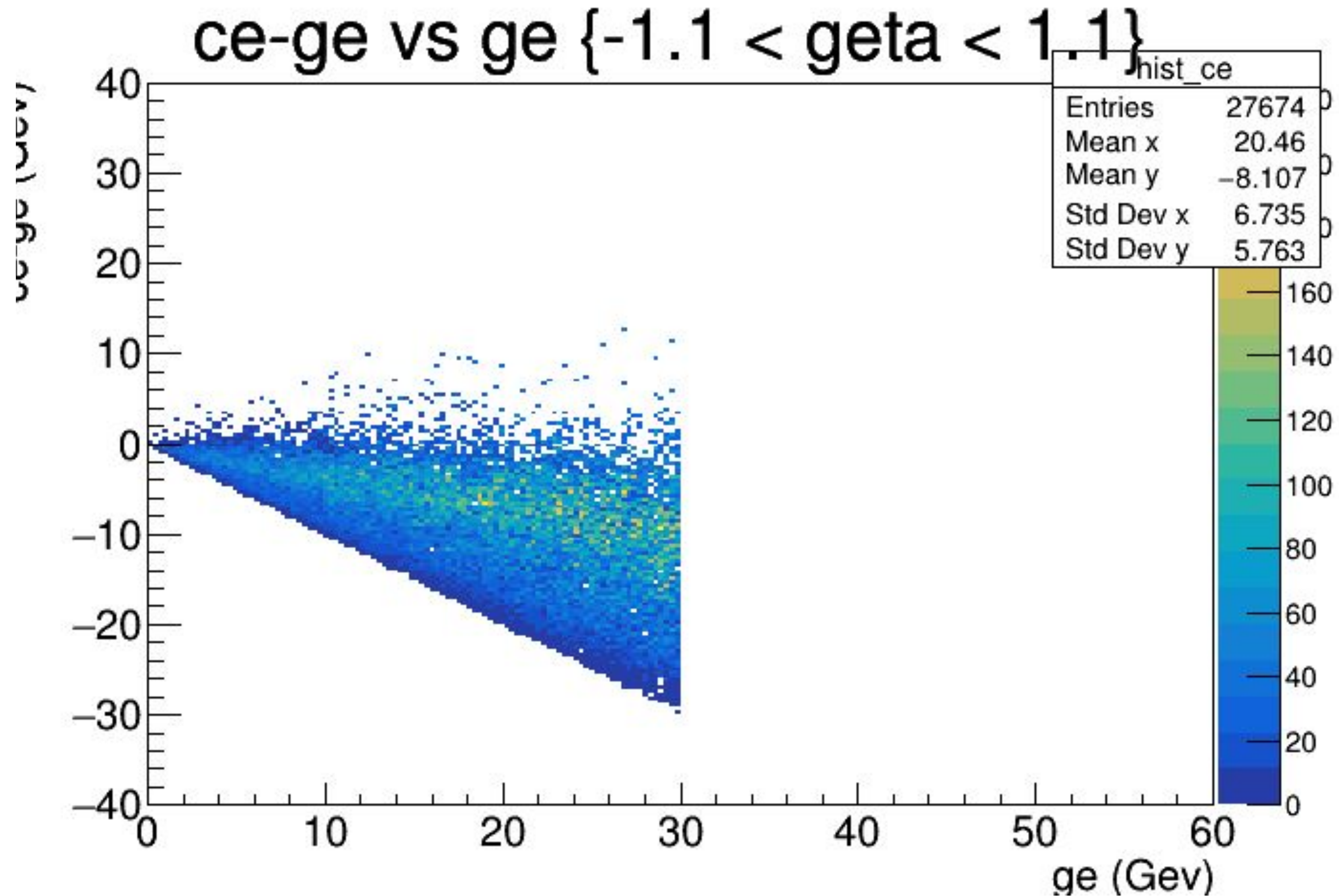
# HCALOUT ( $\pi^-$ )

$\Delta\eta$  vs  $g_e$   
Explicit  $\eta$  cut: -1.1 to 1.1  
Energy Cut: 0.2GeV



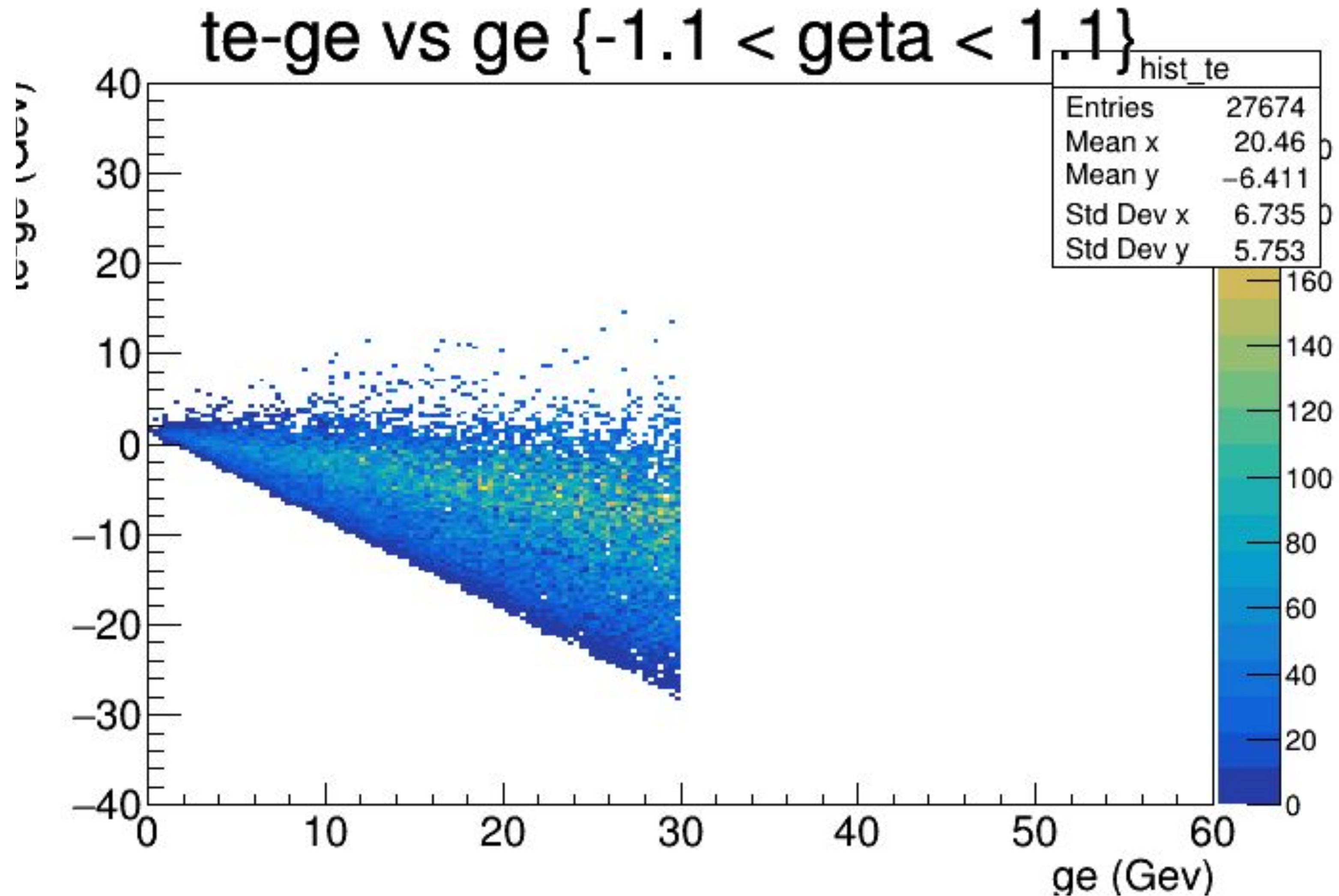
# HCALOUT ( $\pi^-$ )

(ce-ge) vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1



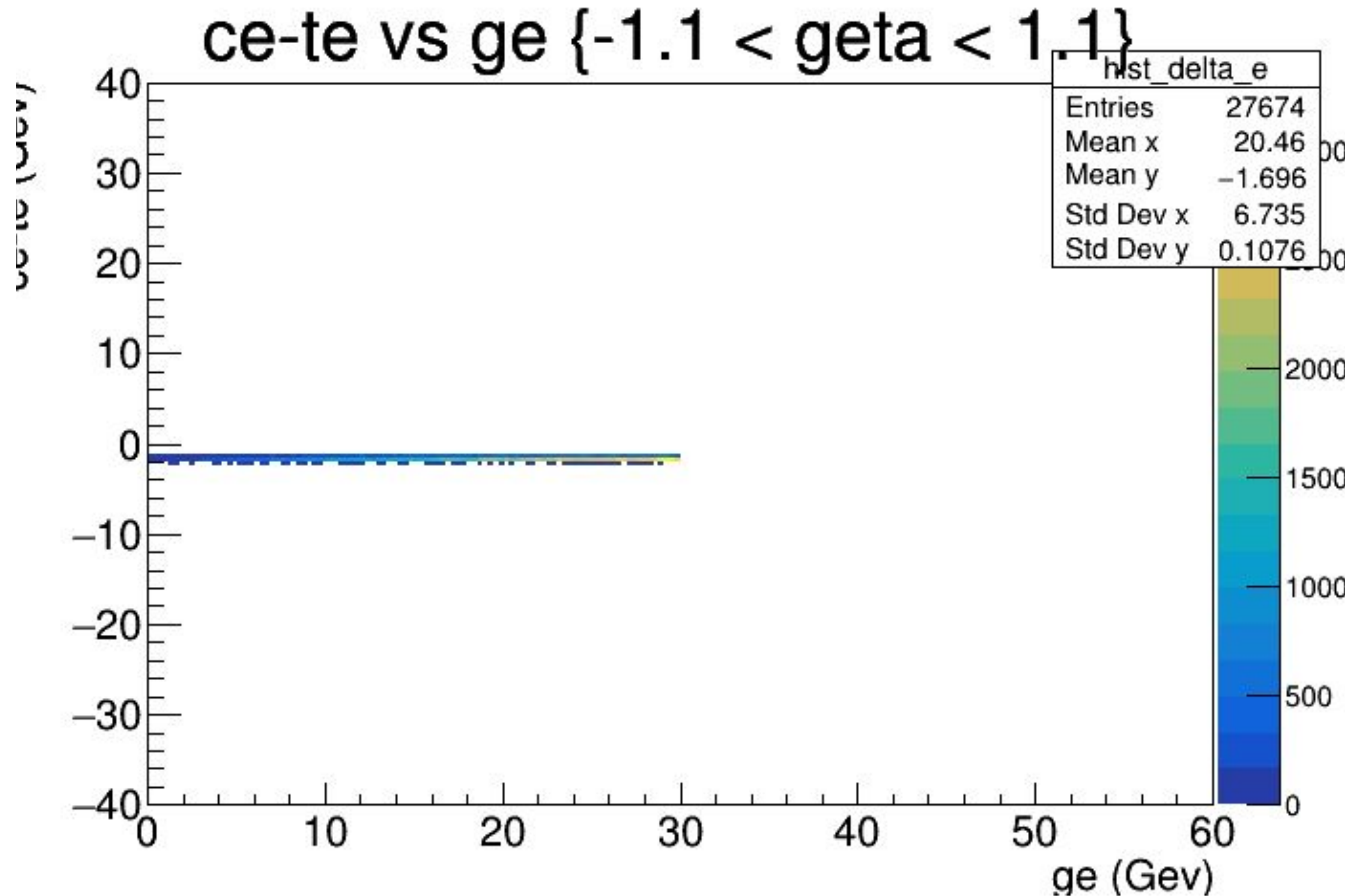
# HCALOUT ( $\pi^-$ )

(te-ge) vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1



# HCALOUT ( $\pi^-$ )

(ce-te) vs ge  
Explicit  $\eta$  cut: -1.1 to 1.1



# HCALOUT ( $\pi^-$ )

Total Energy Counts  
Explicit  $\eta$  cut: -1.1 to 1.1

The total ce is:	179998	GeV
The total te is:	226903	GeV
The total ge is:	414236	GeV



# LOONEY TUNES



*"That's all Folks!"*