

 $\sigma_{\rm E}/{\rm E}$  for #e



Total energy deposit in all Sci Layers #e

Mean Energy Deposit to primary Energy



# Longitudinal shower profile for nu\_tau CC & nu NC

Energy deposit, 50 layers: Absorber(Fe, 5. cm) x SciFi (Poly, 0.5 cm) x Sci (Poly, 1.5 cm)





## Baricenter distribution at different Z-levels

NC

NC: Center of Gravity:  $sqrt(cog_x^2 + cog_y^2)$  at different Z-level



# CC

## Center of Gravity: $sqrt(cog_x^2 + cog_y^2)$ at different Z-level



## Baricenter distribution at different Z-levels

NC



# CC

Center of Gravity: sqrt(cog\_x^2 + cog\_y^2) at different Z-level



# Sum hadron energy vs baricenter

## Correlation plots between Sum\_hadron energy vs baricenter for different z level 0 layer 5 layer 10 layer











6 5







# Ratio: between Sum hadron energy to baricenter for different z level

0 layer

first 6 layers different scale

NC - blue CC - red hist(cogXY/energy)



1 layer

2 layer

## Ratio: between Sum hadron energy to baricenter for different z level 0 layer 5 layer

NC - blue CC - red hist(cogXY/energy)



# 10 layer

# neutrino primary energy vs baricenter

## Correlation plots between neutrino energy vs baricenter for different z level 0 layer 5 layer 10 layer



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 0



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 15



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 5

CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 10



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 25

동 <sup>140</sup>

120

100

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cogY

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CC\_level\_z20

Mean x 89.67

Mean y 31.72

Std Dev x 31.42

Std Dev y 23.03

6043

8

7

Entries







# Correlation plots between neutrino energy vs baricenter for different z level15 layer20 layer25 layer



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 15





CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 20

CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 25





## Ratio: between neutrino energy to baricenter for different z level 0 layer 5 layer ratio: Energy / sqrt(cogX^2 + cogY^2) for i=5

NC - blue CC - red hist(cogXY/energy)





### ratio: Energy / sqrt(cogX^2 + cogY^2) for i=0





# 10 layer

ratio: Energy / sqrt(cogX^2 + cogY^2) for i=10



13

## Ratio: between neutrino energy to baricenter for different z level first 6 layers different scale 0 layer

ratio: Energy / sqrt(cogX^2 + cogY^2) for i=0

NC - blue CC - red hist(cogXY/energy)

1DhistogramNC\_0 Entries Mean 0.06623 Std Dev 0.1218 1DhistogramCC\_0 Entries 0.03556 Mean Std Dev 0.06152 10<sup>2</sup> 10 E 0.2 0.4 0.6 0 0.8 1.2 1.4 1.6 1.8 1 3 layer ratio: Energy / sqrt(cogX<sup>2</sup> + cogY<sup>2</sup>) for i=3 1DhistogramNC\_3 12245 Entries Mean 0.1142 10<sup>3</sup> Std Dev 0.1917 1DhistogramCC\_3 Entries Mean 0.04838 Std Dev 0.09568 10<sup>2</sup> 10 E 0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 1 layer

ratio: Energy / sqrt(cogX^2 + cogY^2) for i=1



ratio: Energy / sqrt(cogX^2 + cogY^2) for i=4



## 2 layer

ratio: Energy / sqrt(cogX<sup>2</sup> + cogY<sup>2</sup>) for i=2



7501

12366

7501

## Correlation plots between neutrino energy vs baricenter for different z level first 6 layers different scale 0 layer 2 layer 1 layer

NC

CC



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 0





CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 1



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 2



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 5





25



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level z2 12302 80.66

34.28

4.831

- 14
- 10

## Correlation plots between neutrino energy vs baricenter for different z level first 6 layers different scale 3 layer 4 layer 5 layer



CC: Energy  $v_{\tau}$  vs sqrt(cogX^2 + cogY^2) for z level = 3















back up

длина большой оси 1d Hist на разных уровнях длина большой оси корреляция от 92 и 16 первичное

correlation cogXY to edep аналогично для эллипса