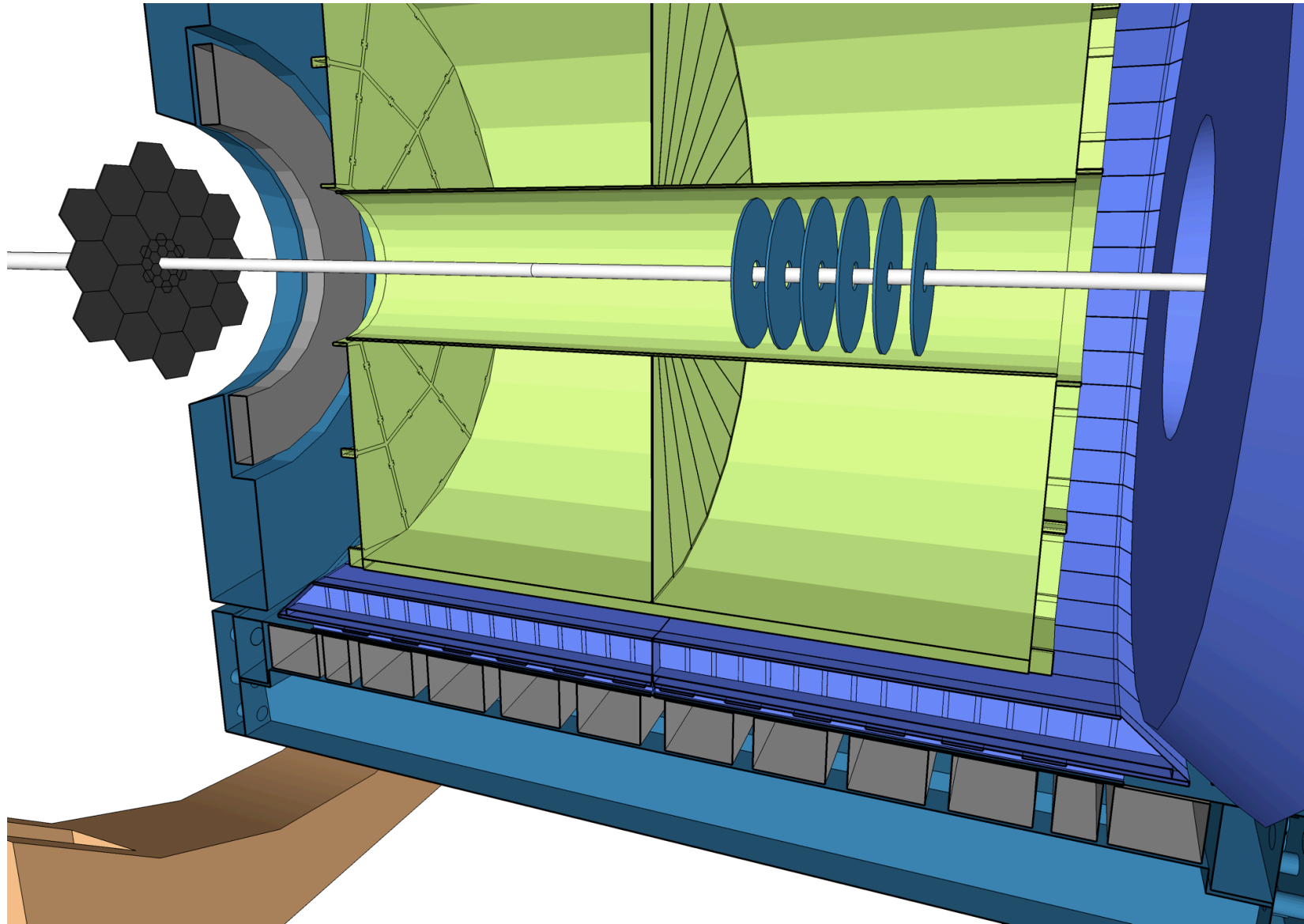


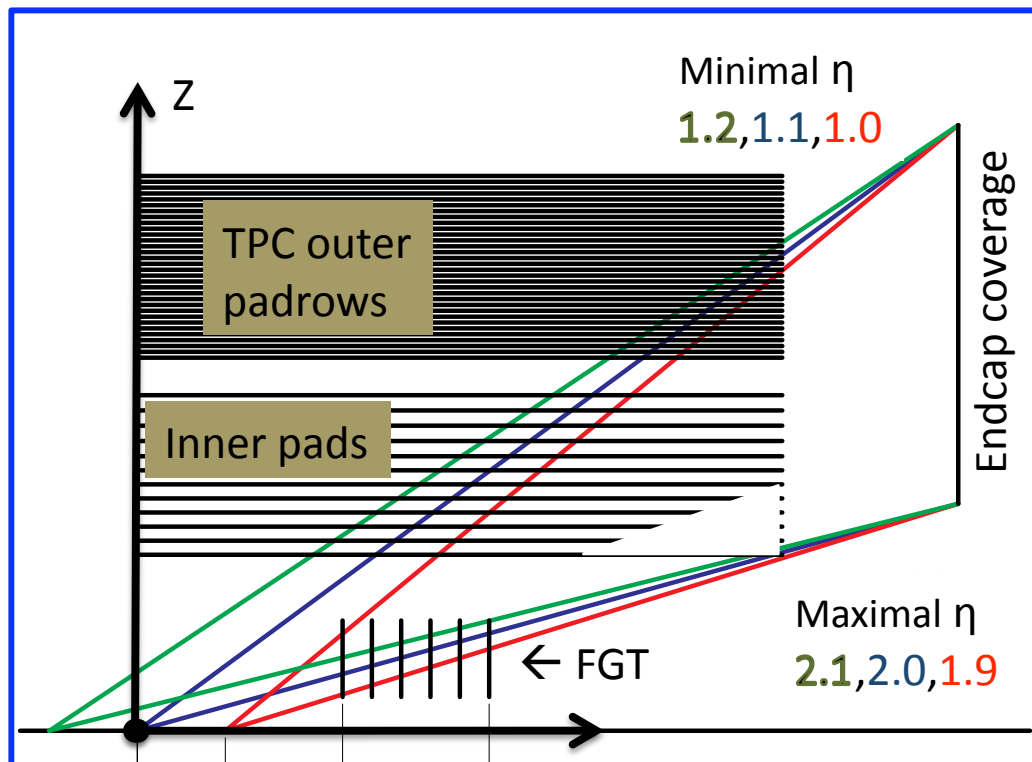
# Simulations of FGT efficiency

1

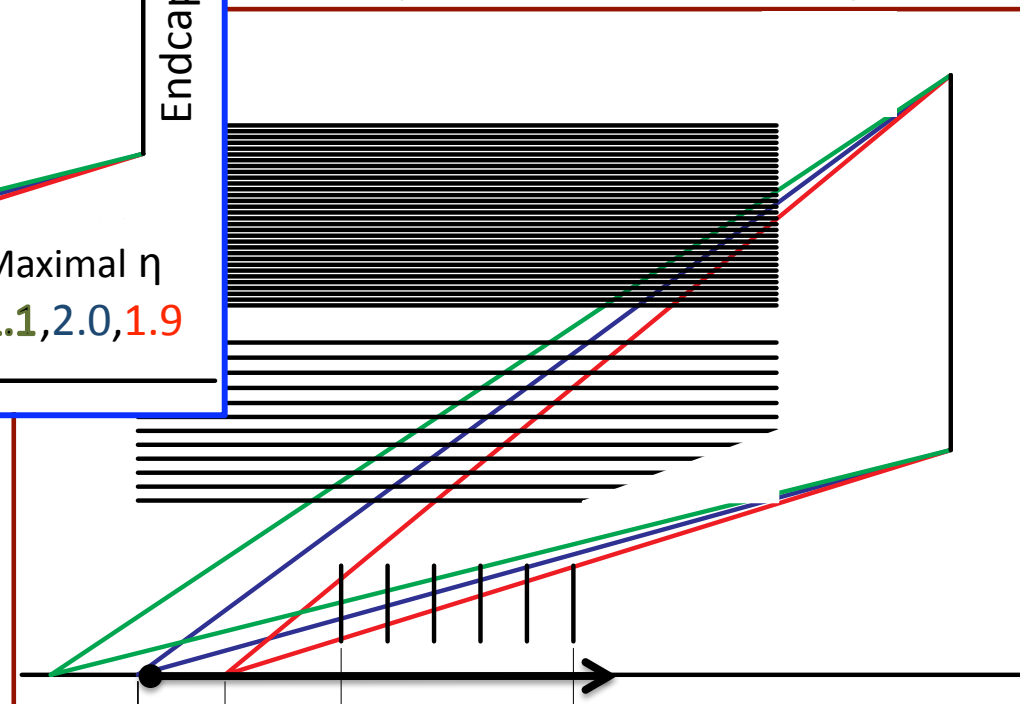


# FGT new (A) and old (B) geometry

6 FGT disks separated by 10 cm



OLD  
6 FGT disks separated by 16 cm  
(last disk was 'not used')

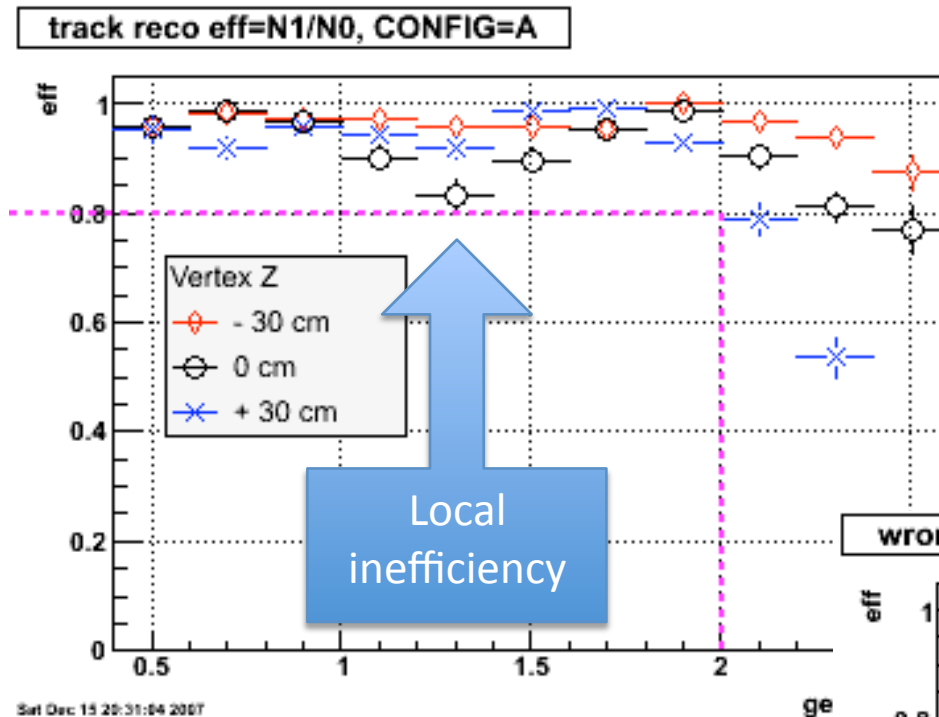


**Reco track is a circle in X-Y projection**

→ 5 measured points needed

→ 3 'hits' + vertex + Endcap SMD

Geom (A)  $Z_1=70, \dots, Z_6=120\text{cm}, D_Z=10\text{ cm}, R_{in}=11.5\text{cm}, R_{out}=37.6\text{ cm}$  3



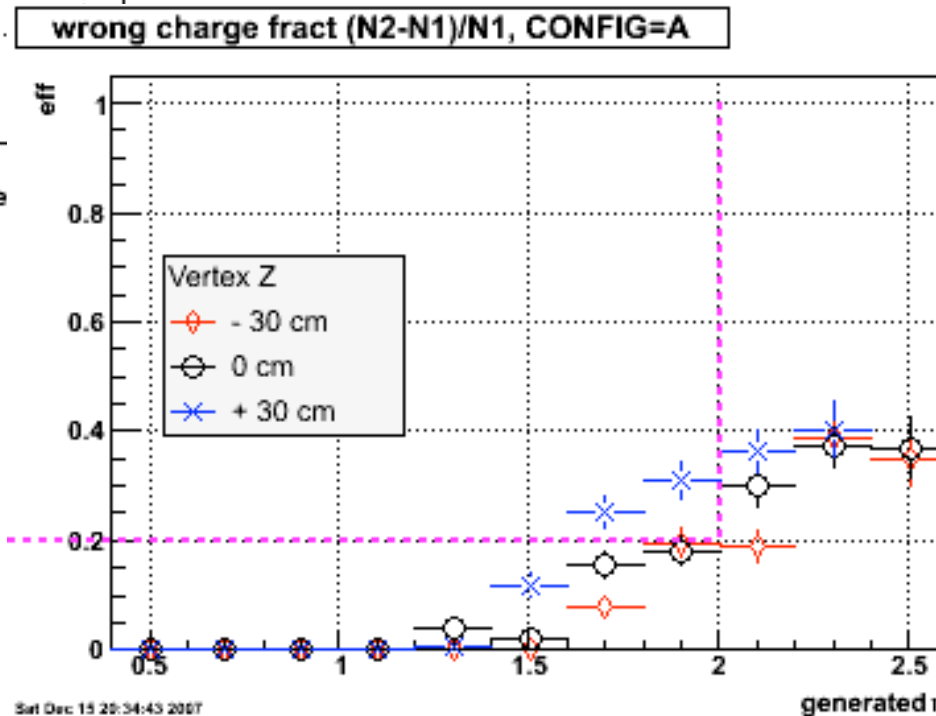
Single electrons at  $P_T=40\text{ GeV}/c$

N0 – thrown

N1- reco, any charge

N2- reco, correct charge

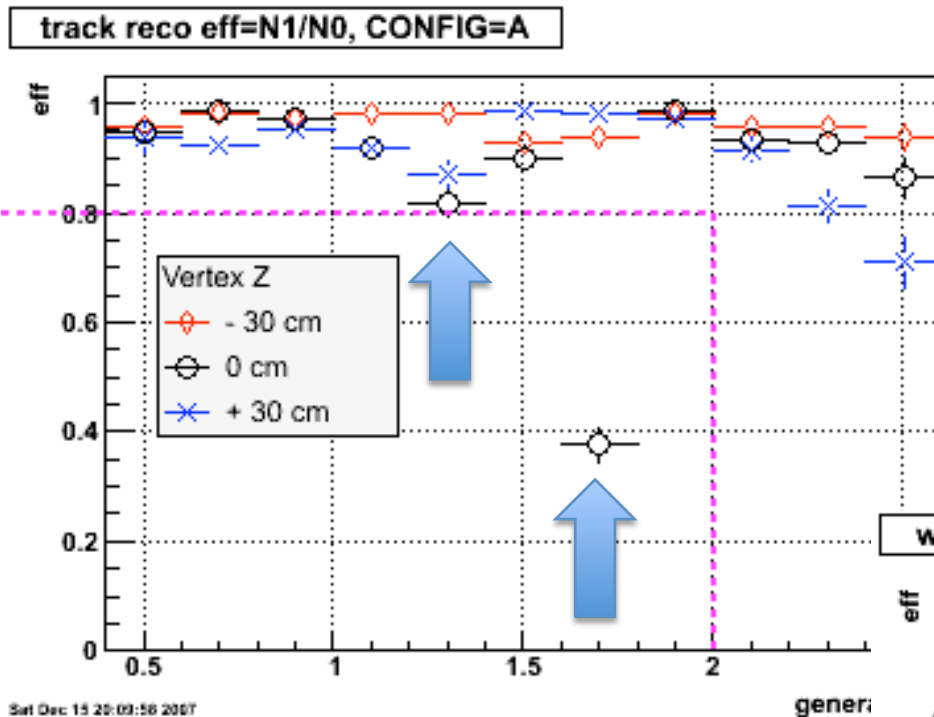
[More details](#)



Optimal geometry

- Track efficiency >80%
- Charge reco good where maters

Geom (B)  $Z_1=70, \dots, Z_6=150\text{cm}, D_Z=16\text{ cm}, R_{in}=11.5\text{cm}, R_{out}=37.6\text{ cm}$  4



Single electrons at  $P_T=40\text{ GeV}/c$

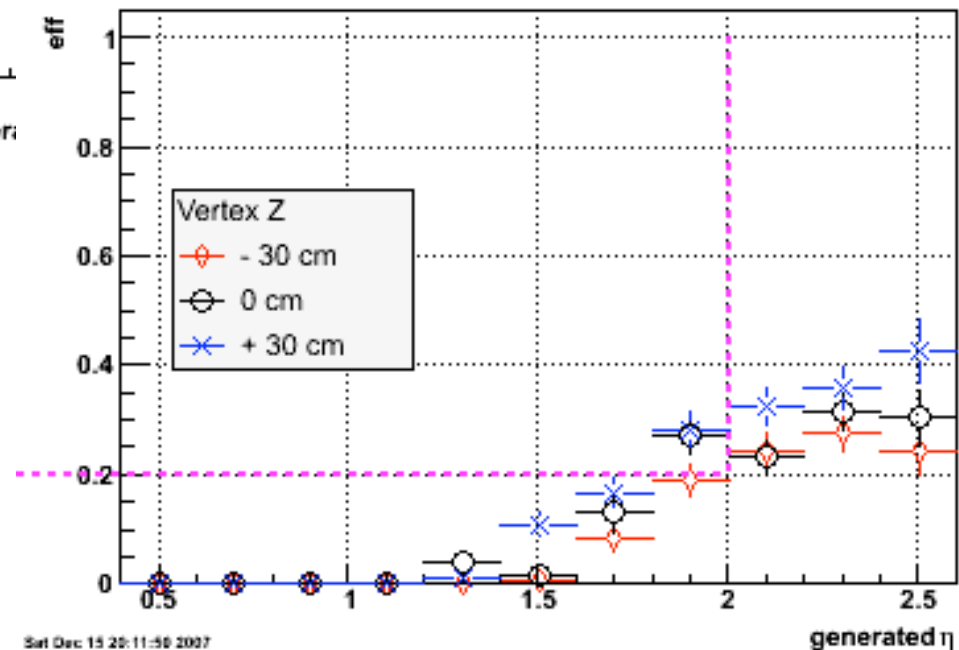
N0 – thrown

N1- reco, any charge

N2- reco, correct charge

[More details](#)

wrong charge fract (N2-N1)/N1, CONFIG=A

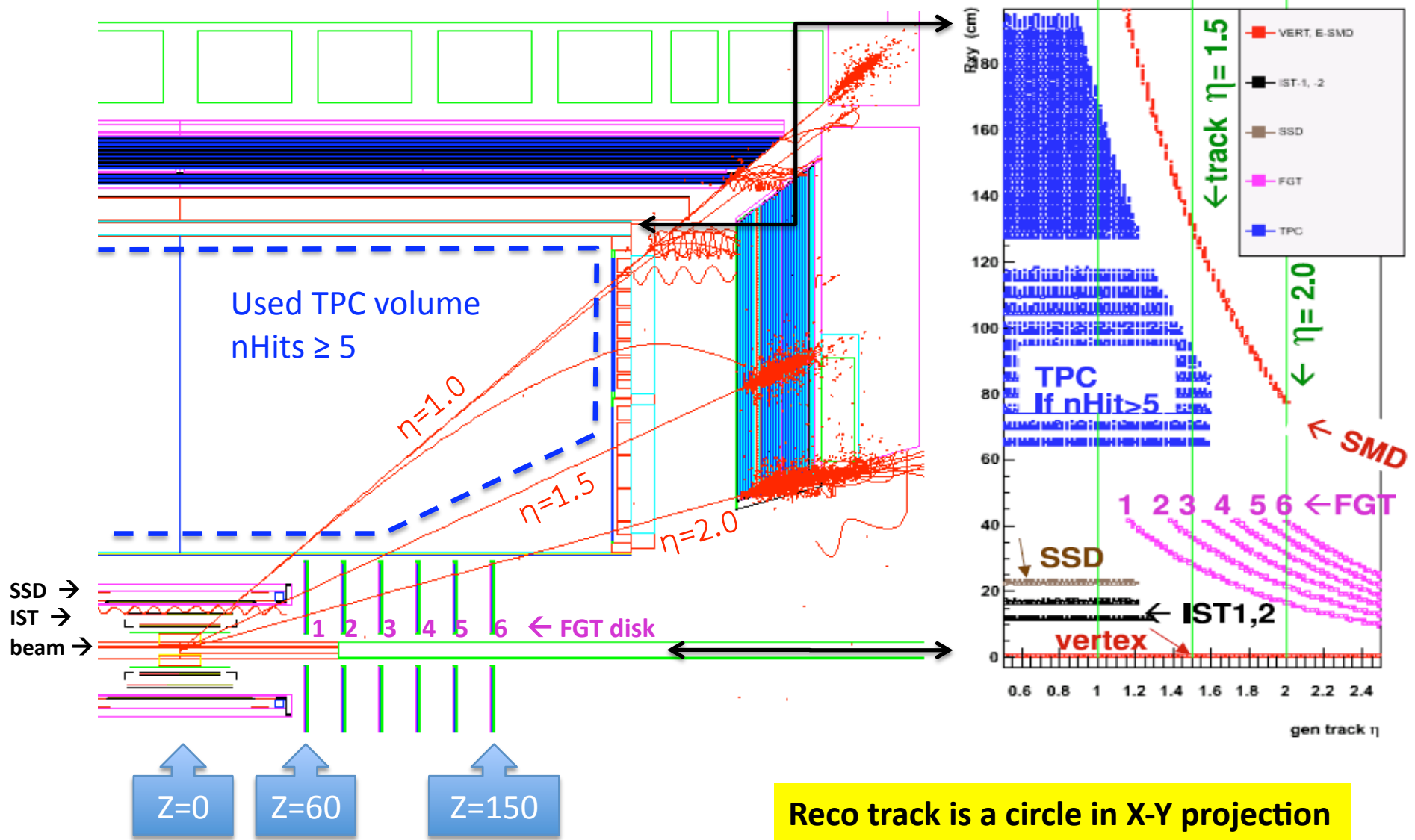


Problem:

-Track effi drop at  $\eta=1.7$

- $\rightarrow$  fix: bring disks closer in Z

# Hit representations: $R_{XY}$ - $Z$ vs. $\eta$ - $Z$



**Reco track is a circle in X-Y projection**  
 → 5 measured points needed  
 → 3 'hits' + vertex + Endcap SMD

## Assumed resolution of used detectors

\* Use: Vertex, IST1+2, SSD, 6-disk FGT, truncated TPC(nHit>=5), ESMD

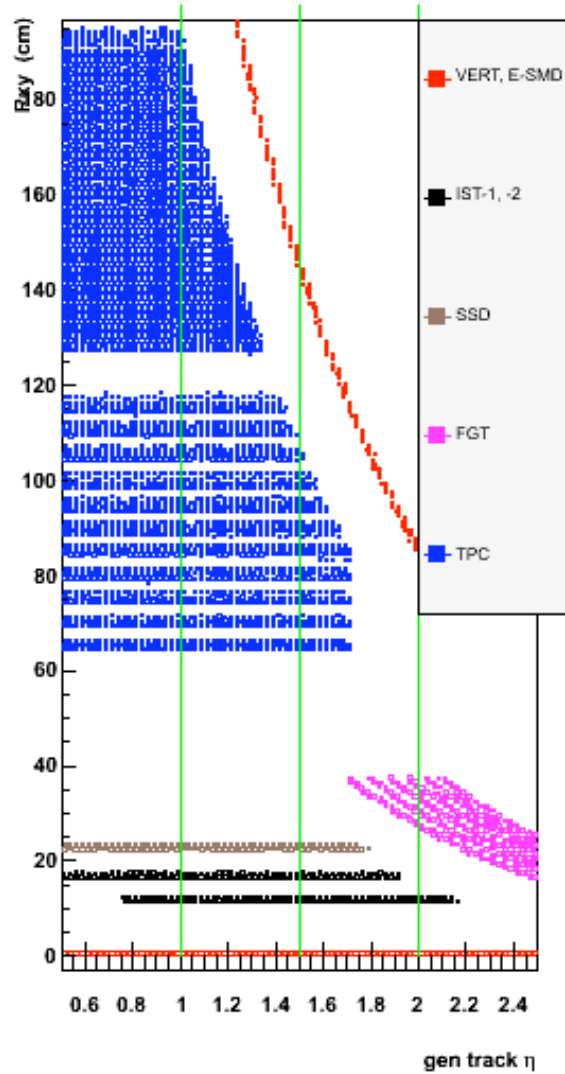
detector	assumed resolution	weight of the point	Remarks
vertex	200 mu m in X,Y 30 cm in Z	$W=1/(200 \text{ mu m})^2$	added as a hit
IST1	20 mum in r*phi 0.5 mm in Z	$W=1/(20 \text{ mu m})^2$	-
IST2	0.5 mm in r*phi 20 mum in Z	$W=1/(0.5 \text{ mm})^2$	-
SSD	20 mum in r*phi 1 mm in Z	$W=1/(20 \text{ mu m})^2$	-
FGT	60 mu m in X,Y 1 mm in Z	$W=1/(60 \text{ mu m})^2$	6 disks hit reco eff=100%
TPC	1 mm along arc 1 mm in Z	$W=1/(1\text{mm})^2$ nHit>=5	* drop padrow #1 and #13 * drop hits at  Z >197 cm * drop all hits if below 5
Endcap SMD mock hit **)	1.5 mm in X,Y 5mm in Z	$W=1/(1.5 \text{ mm})^2$	at xPoint of Geant helix w/ SMD plane

**Track reco efficiency** is defined as the ratio of# of reco tracks (N1) w/  
 \* nFitP>=5, including vertex as a hit  
 \* delPhi<3 mrad  
 \* delTheta <3 mrad  
 to the # of generated electrons (N0).

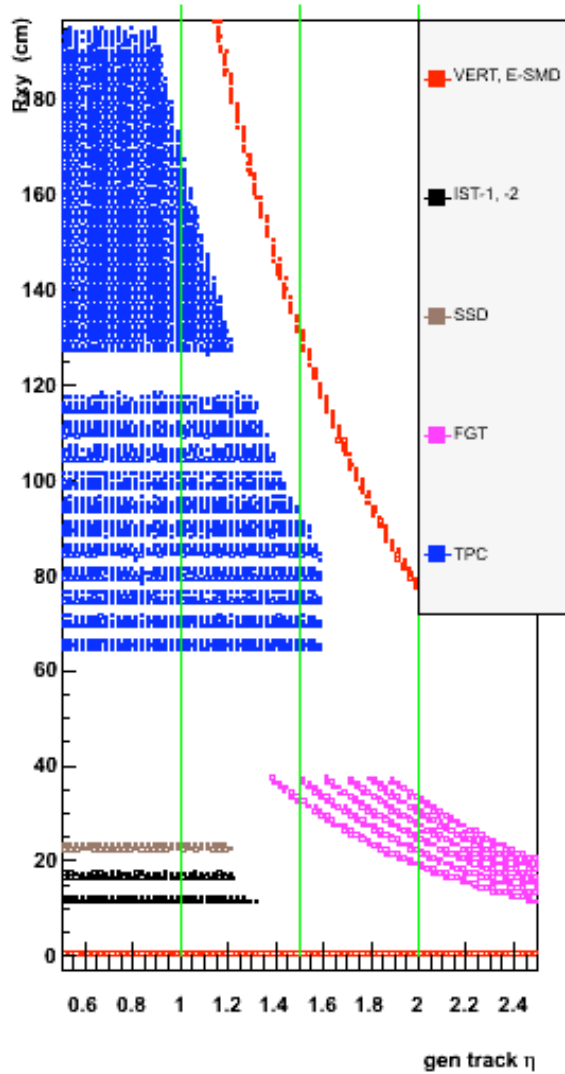
**Charge reco efficiency** requiers additinal  
 \* the sign of the reco charge is correct. Track counter is N2.  
 No cut on reco pT is imposed.

Geom (A)  $Z_1=70, \dots, Z_6=120\text{cm}, D_z=10\text{ cm}, R_{in}=11.5\text{cm}, R_{out}=37.6\text{ cm}$  <sup>7</sup>

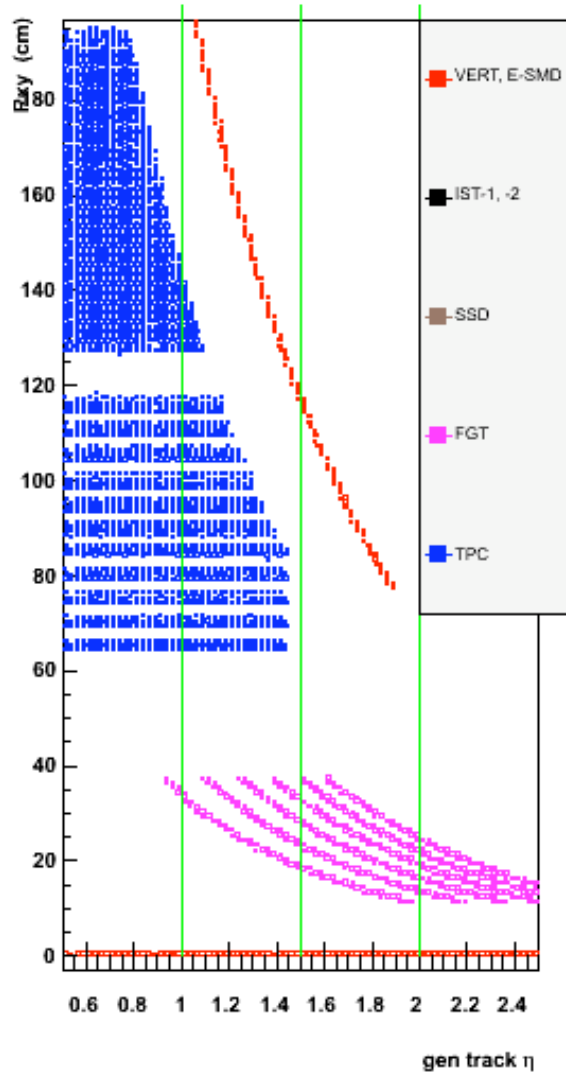
Hits per track , zVert= - 30 cm



Hits per track , zVert= 0 cm

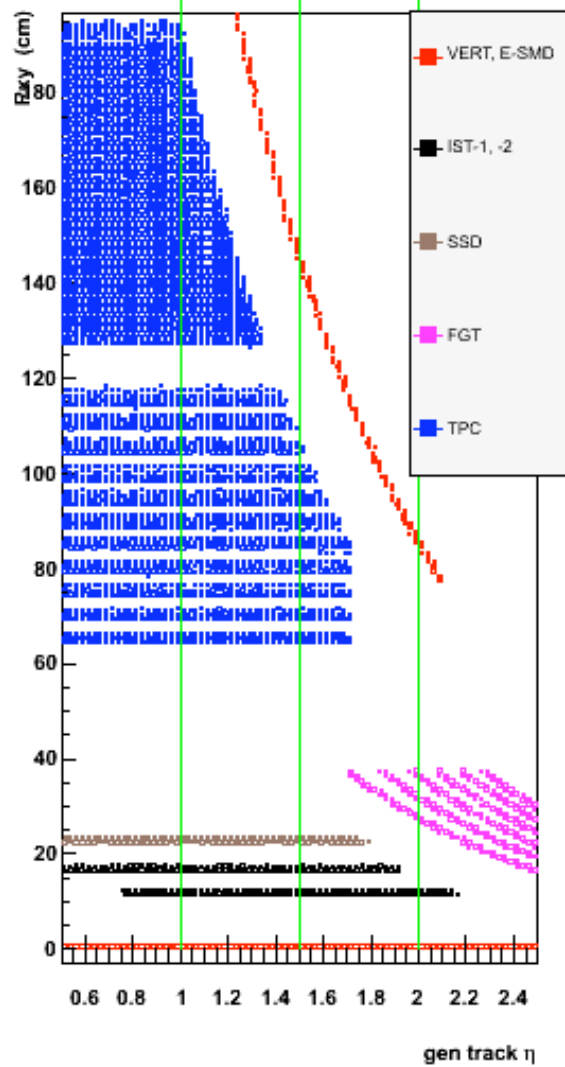


Hits per track , zVert= + 30 cm

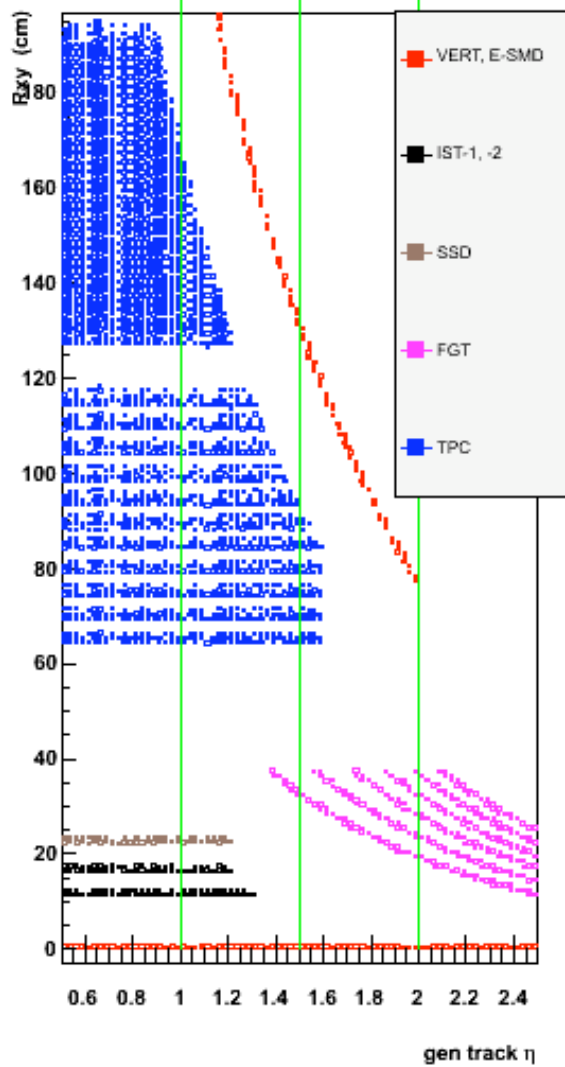


Geom (B)  $Z_1=70, \dots, Z_6=150\text{cm}, D_z=16\text{ cm}, R_{in}=11.5\text{cm}, R_{out}=37.6\text{ cm}$  8

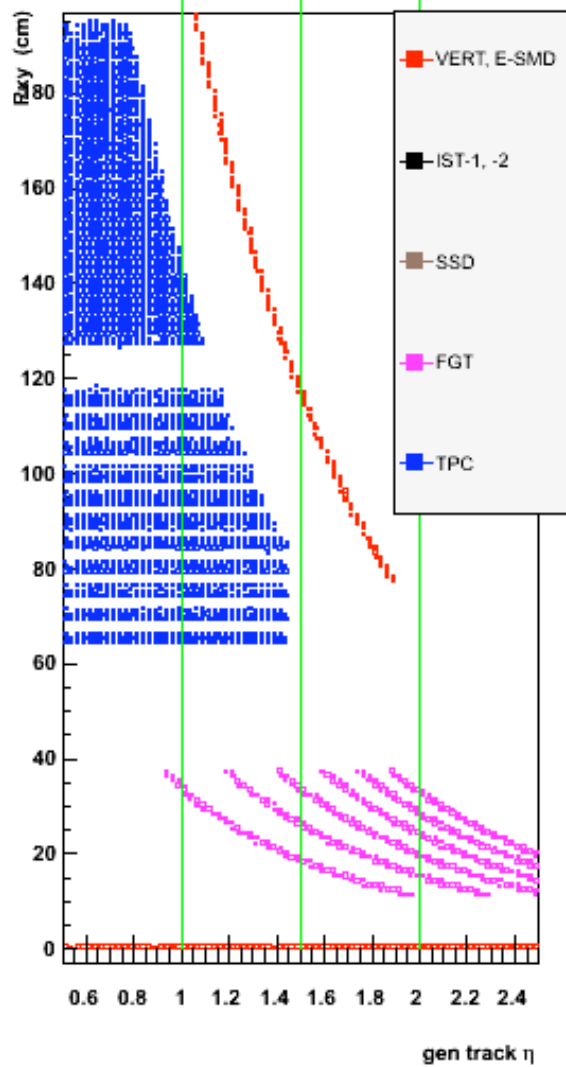
Hits per track , zVert= - 30 cm



Hits per track , zVert= 0 cm

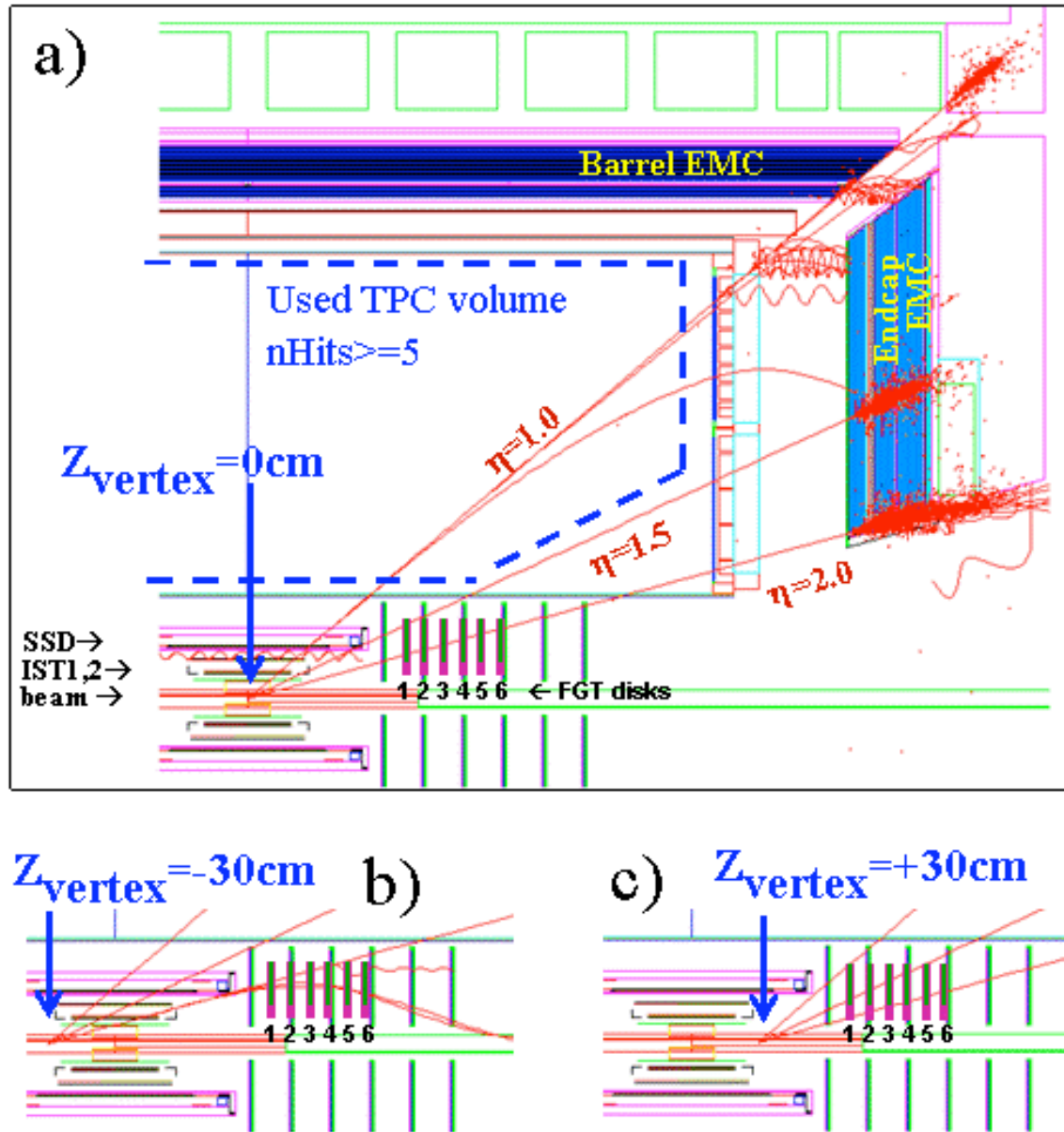


Hits per track , zVert= + 30 cm

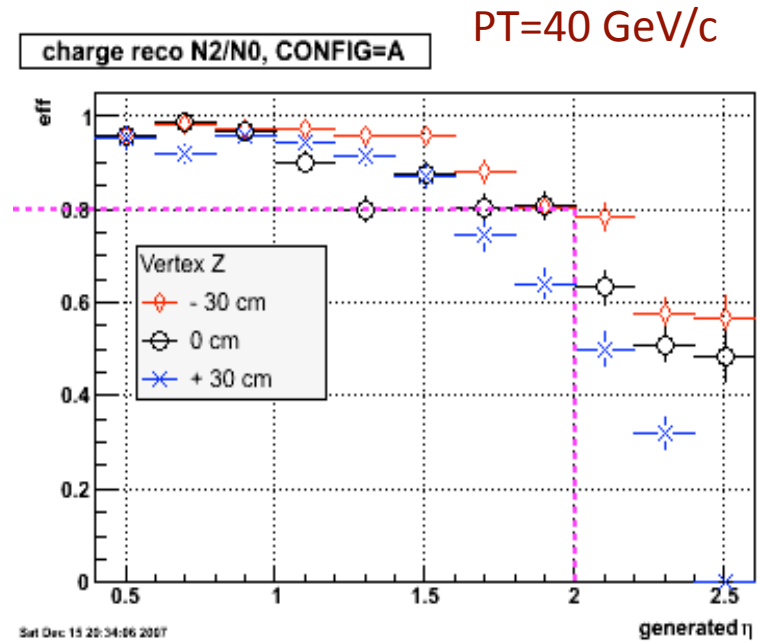
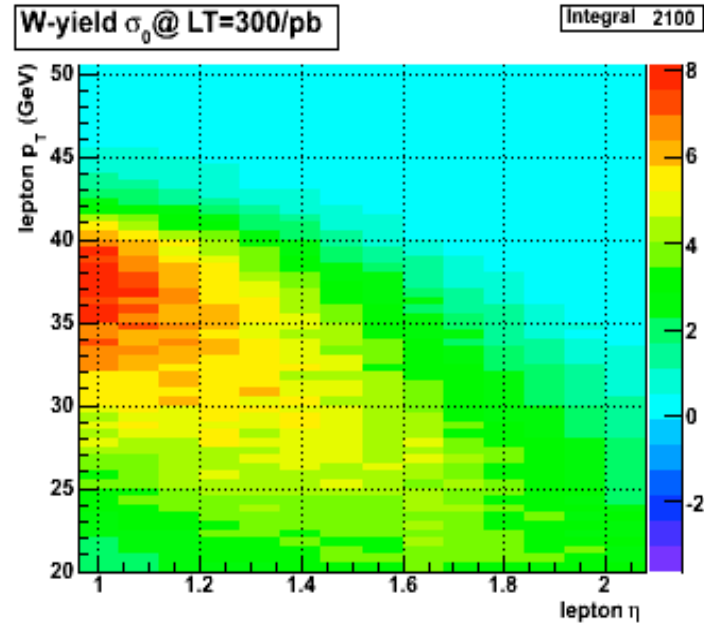
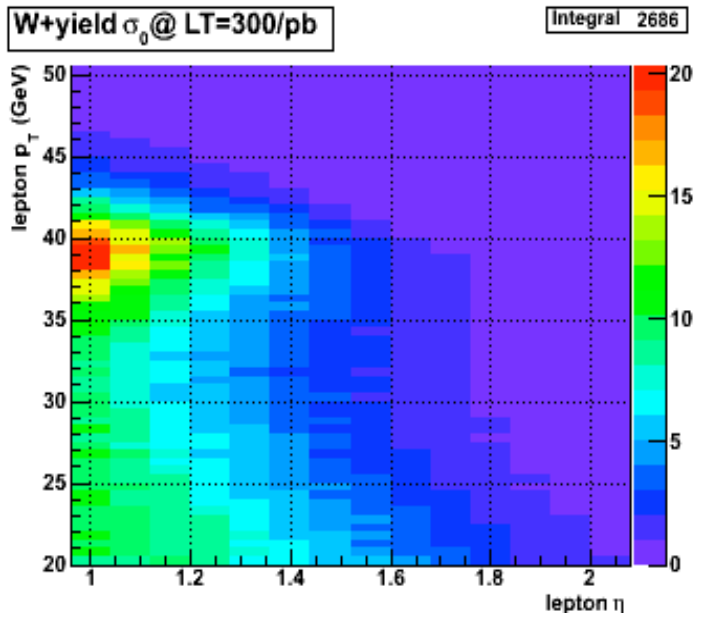




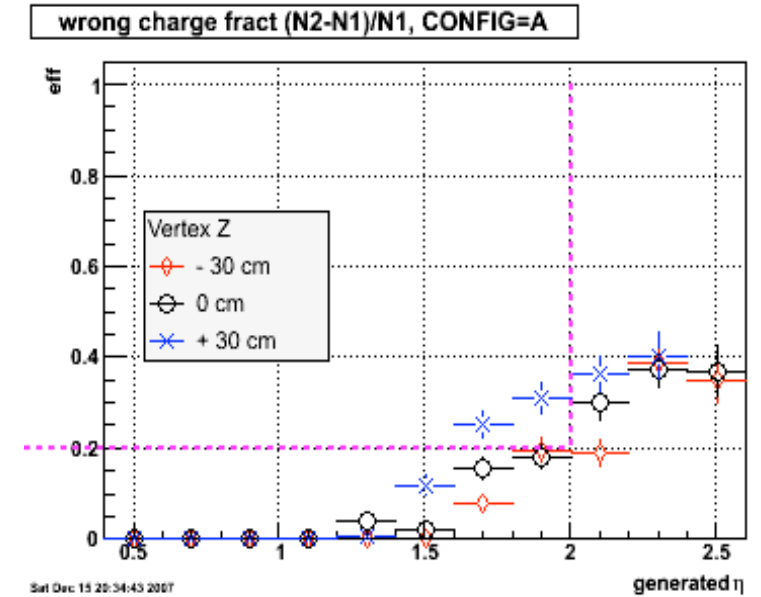
Range of Z-vertex is [-30, +30] cm



# Charge reco efficiency at STAR FGT



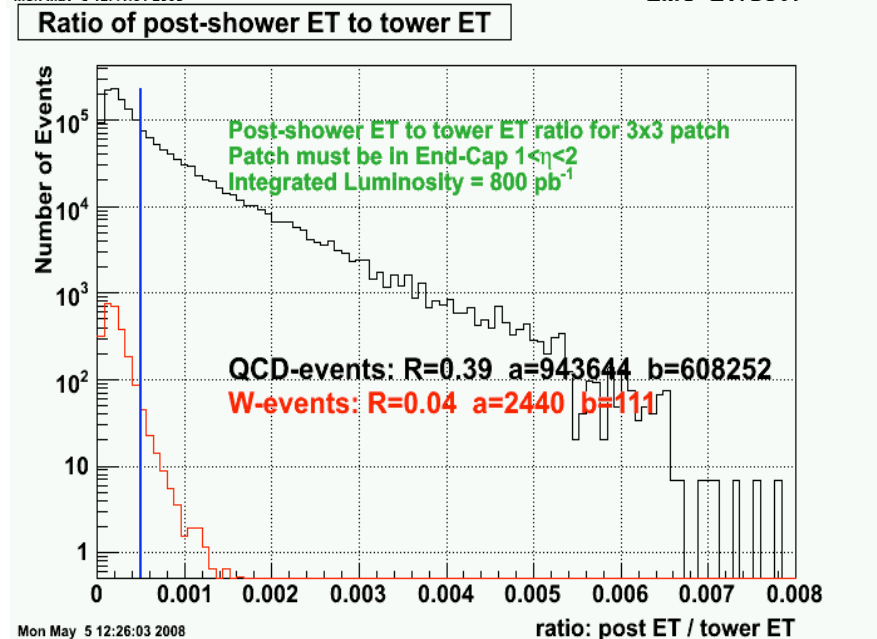
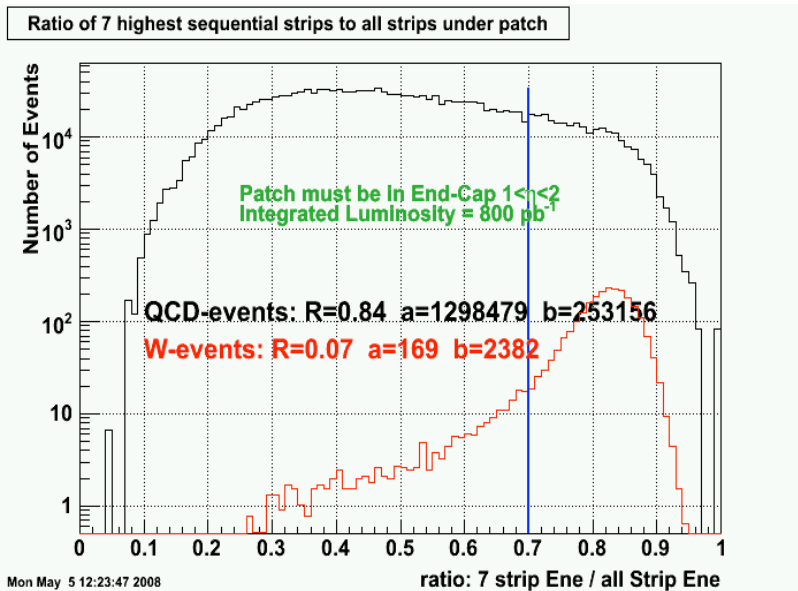
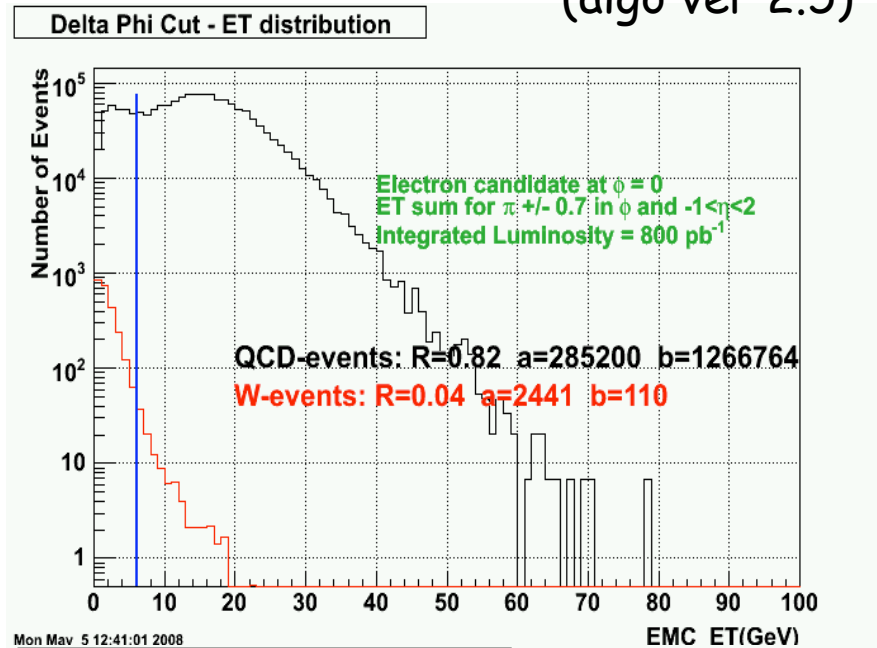
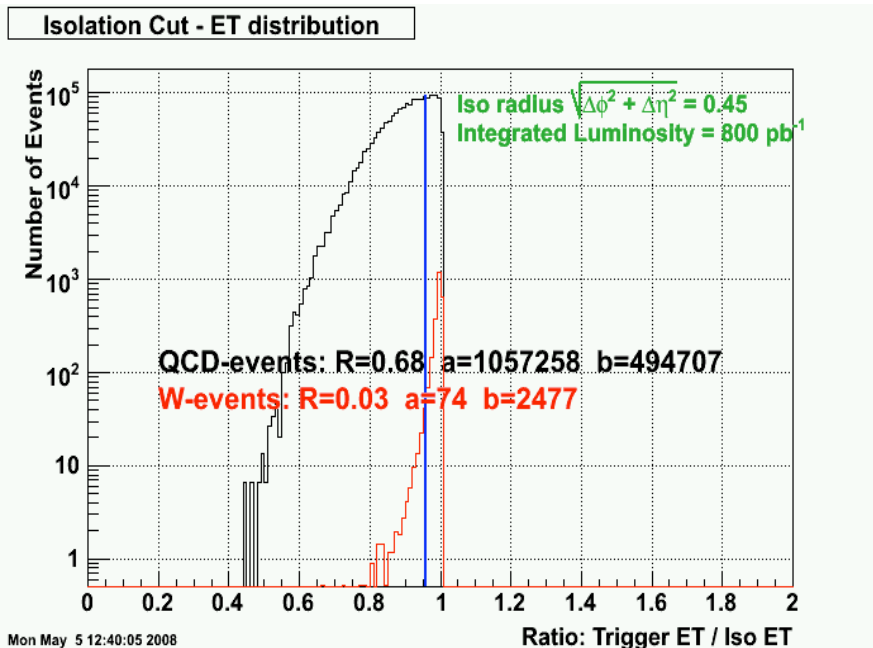
Sat Dec 15 20:34:06 2007



Sat Dec 15 20:34:43 2007

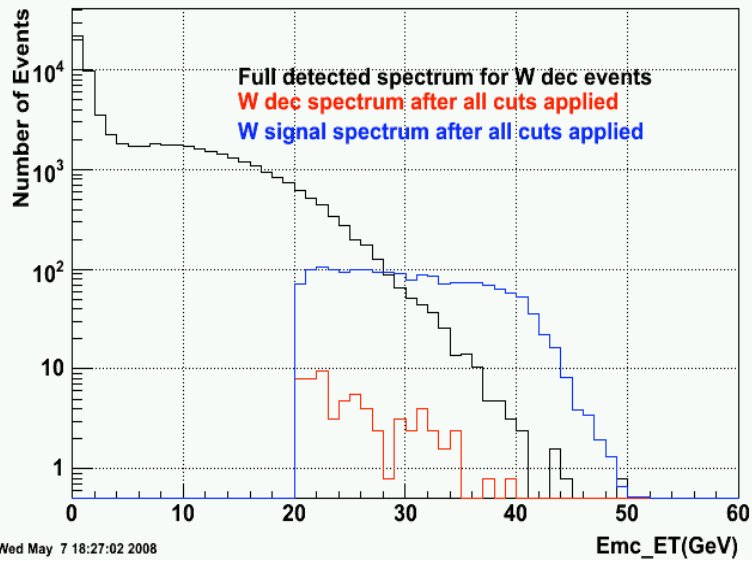
# e/h algo cuts for STAR LT=800/pb

(algo ver 2.5)

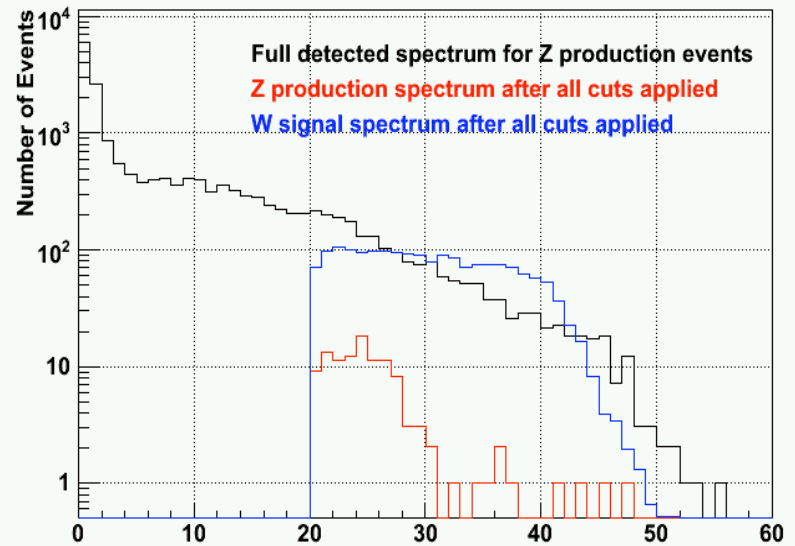


# 'background' channels with PV AL , STAR, LT=800/pb

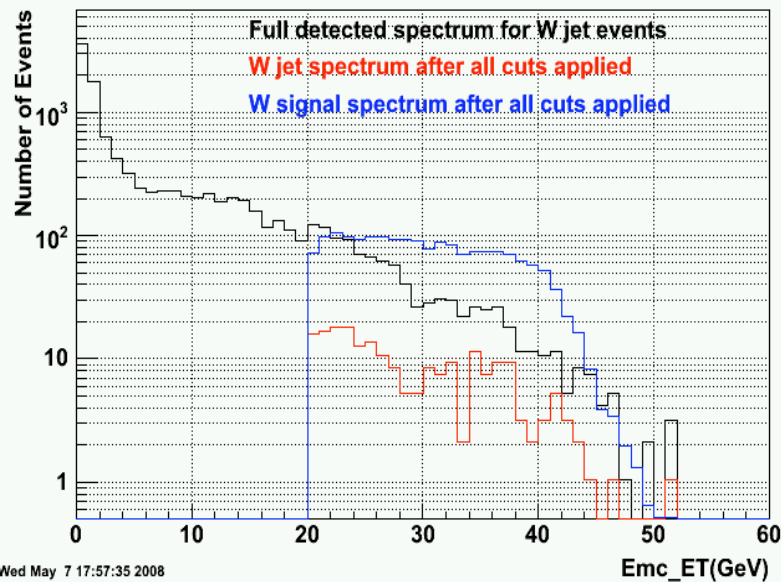
Spectra for W dec events



Spectra for Z production events



Spectra for W jet events



Spectra for Z jet events

