

---

Subject: forward endcap quest goes on  
Posted by [Irina Brodski](#) on Fri, 22 May 2009 12:56:52 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Dear all,

i have a problem with the endcap again. It is a shift of 2 quarters of the endcap by a distance of few cm in z direction. It only appears for the positions of clusters and not for hits or digis, also i can not see it in the sim\_emc.root.

the following pictures are from a simulation of photons (1GeV,  $0 < \theta < 25^\circ$ ,  $0 < \phi < 360^\circ$ , geant4, pandaroot\_trunk, standart macros from pandaroot/macro/emc) can anyone explain this?

Thank you for your help in advance,  
Irina

---

#### File Attachments

- 1) [xyzEmcCluster->Where.pdf](#), downloaded 480 times
  - 2) [zEmcCluster->Where.pdf](#), downloaded 460 times
  - 3) [xyzEmcHits.pdf](#), downloaded 476 times
  - 4) [zEmcHits.pdf](#), downloaded 489 times
- 

---

Subject: Re: forward endcap quest goes on  
Posted by [Irina Brodski](#) on Tue, 26 May 2009 13:21:54 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Dear all,

the problem is also visible for the Digis:  
you see in red the Z-position of EmcRecoHit  
in green (nearly exactly overlapping with blue) the Z-position of EmcCluster  
in blue the Z-position of EmcDigis  
in yellow the Z-position of EmcHits  
regards, Irina

---

#### File Attachments

- 1) [4inone.pdf](#), downloaded 383 times
- 

---

Subject: Re: forward endcap quest goes on  
Posted by [Irina Brodski](#) on Tue, 26 May 2009 14:51:06 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

---

#### File Attachments

- 1) [maxandmin.pdf](#), downloaded 411 times
-

Subject: Re: forward endcap quest goes on  
Posted by [Bertram Kopf](#) on Tue, 26 May 2009 21:04:14 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi Irina,  
the electromagnetic shower starts in general not directly at the front face of the crystals.  
Therefore the reconstruction takes a certain shower depth of a few cm into account. This could  
cause the inconsistencies in the position between the EmcHits, EmcDigis and the  
EmcRecoHits.  
Please check, if your obtained shifts are comparable with the offset used for the calculation of  
the digi- and reco-hit position.

Cheers,  
Bertram.

---

---

Subject: Re: forward endcap quest goes on  
Posted by [Irina Brodski](#) on Tue, 26 May 2009 21:58:46 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi Bertram,

i will check this, but anyhow i wouldn't expect one shift range for two quarters and an other for  
the other two.

regards, Irina

---

---

Subject: Re: forward endcap quest goes on  
Posted by [Aleksandra Biegun](#) on Wed, 10 Jun 2009 14:58:37 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Dear Irina, dear All,

last time few checks for the forward endcap emc have been done  
to find the source of the problem with 2 different Z-positions  
for 2 diagonal quarters of the endcap  
and it seems that, finally, it is found.

To solve that problem I need a bit of time.  
Since the collaboration meeting is very soon  
and I am busy with the analysis, I will correct it afterwards.

Best regards,  
Ola.

---

---

Subject: Re: forward endcap quest goes on  
Posted by [Irina Brodski](#) on Wed, 10 Jun 2009 19:03:17 GMT

Hi Ola,  
these are great news. Thank you. Please tell me when the code is changed.  
Best regards, Irina

---

---

Subject: Re: forward endcap quest goes on  
Posted by [Aleksandra Biegun](#) on Thu, 02 Jul 2009 13:57:11 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi Irina, hi All,

the problem Irina has had with the forward endcap  
with GEANT 4 is fixed now.  
Somehow, the single Reflection() I have made  
for Quarter number 2 and 4 caused the problem with the Z shift.

So, I have changed the macro which creates the geometry  
of the forward endcap (FwEndCap) and now it is called:  
createRootGeoFileFwEnd\_fixed.C.  
It does not have Reflection() function.  
It is committed to svn to:  
../trunk/macros/emc/  
and creates the root file with the same name like was before,  
i.e. emc\_module3new.root  
(also committed to svn),  
so you don't need to do any changes,  
just do svn update.

I also had to change a little bit  
../trunk/emc/EmcTools/PndEmcStructure.cxx.

I put the same plots made twice:  
for GEANT 4 and, to compare, for GEANT 3.

At the plots:  
z\_ene\_hits\_digi\_clusters\_g[GEANT]\_fwendcap\_m3changed\_fixed.png

you can see that Z-position for all 4 Quarters of the FwEndCap  
is in the same Z for GEANT 4. For GEANT 3 it was fine before.

The mapping is also fine, should be the straight line  
in each Quarter (each copy), what you can see at plots:  
xpad\_x\_points\_m3\_g4\_fixed.png - for X direction  
ypad\_y\_points\_m3\_g4\_fixed.png - for Y direction

Quarters of the FwEndCap are placed in the clockwise direction looking downstream.

Different parameters for Points, also Z-position of all 4 Quarters, are shown at plots:

points\_g4\_fwendcap\_m3changed\_fixed.png - for GEANT 4

points\_g3\_fwendcap\_m3changed\_fixed.png - for GEANT 3.

Irina, please check it.

I do hope there will not be any problem, but in case of any,  
let me know.

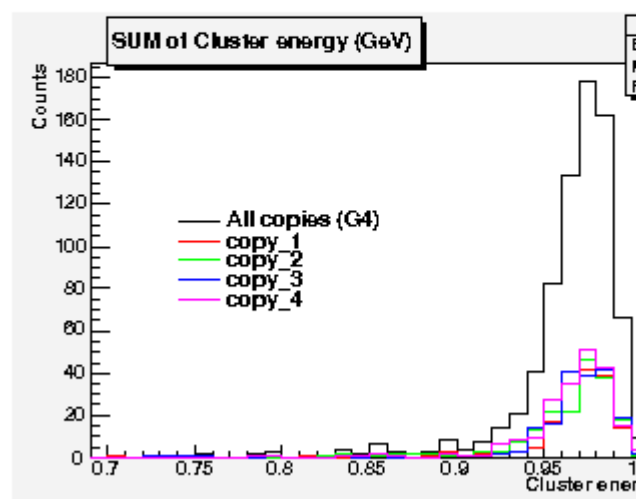
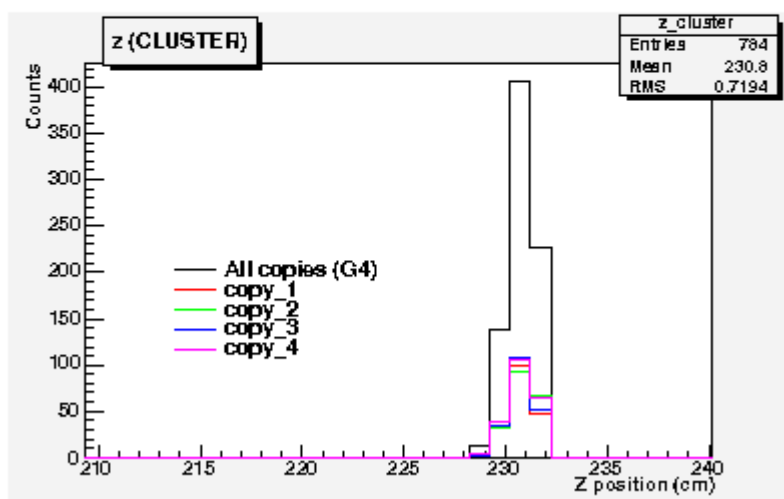
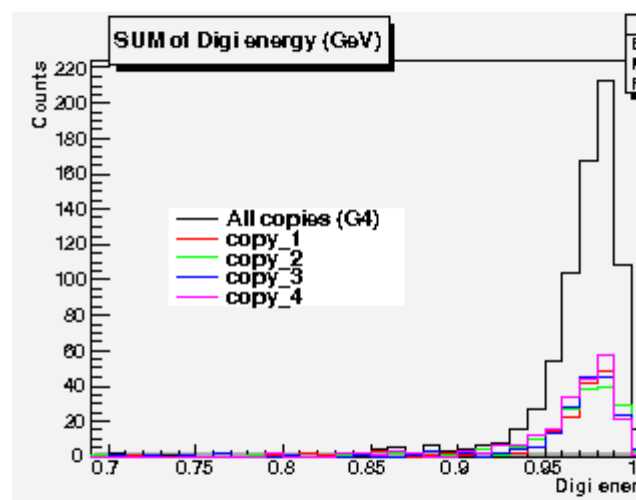
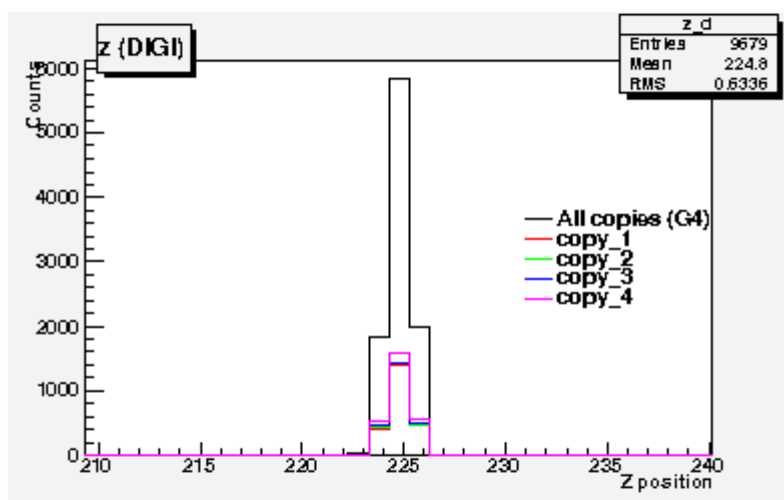
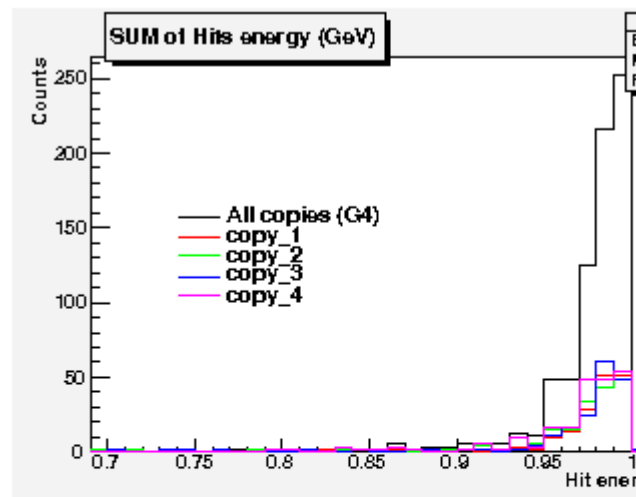
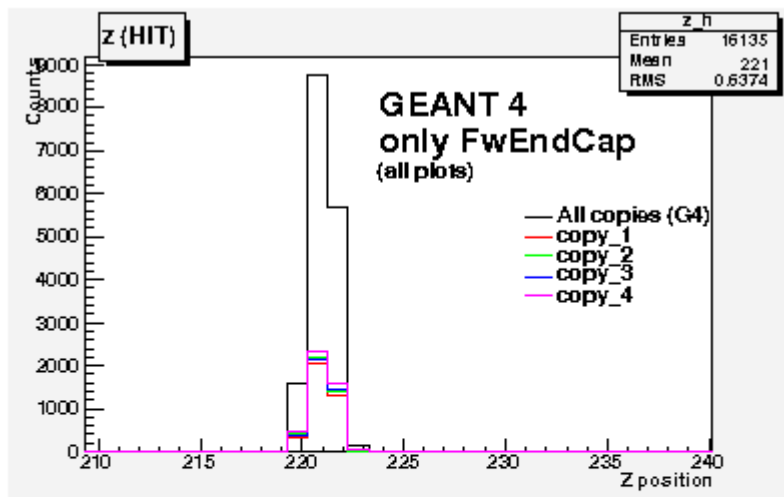
If you have any question, do not hesitate to ask.

Best regards,  
Ola.

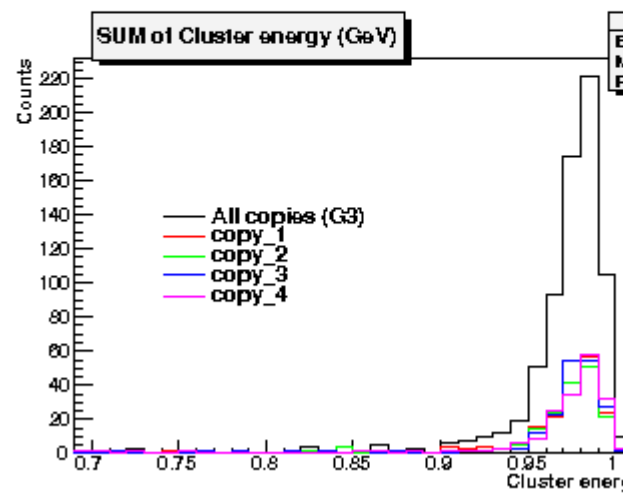
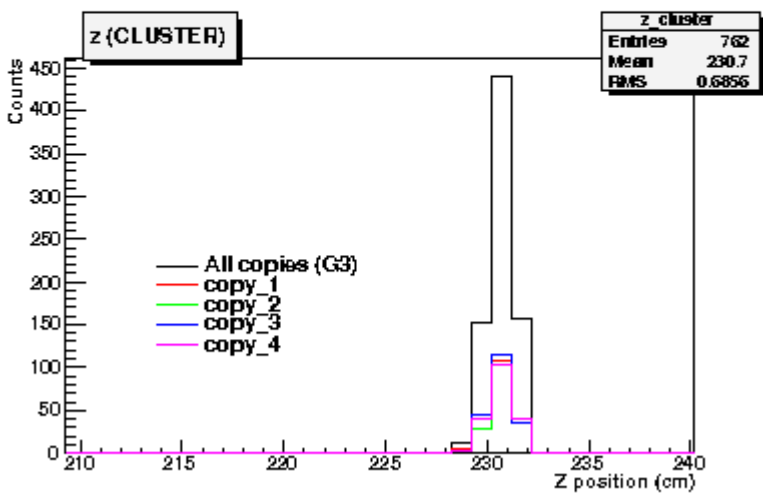
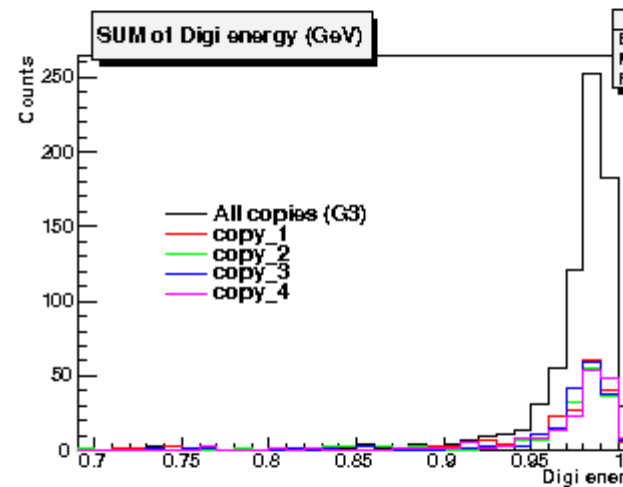
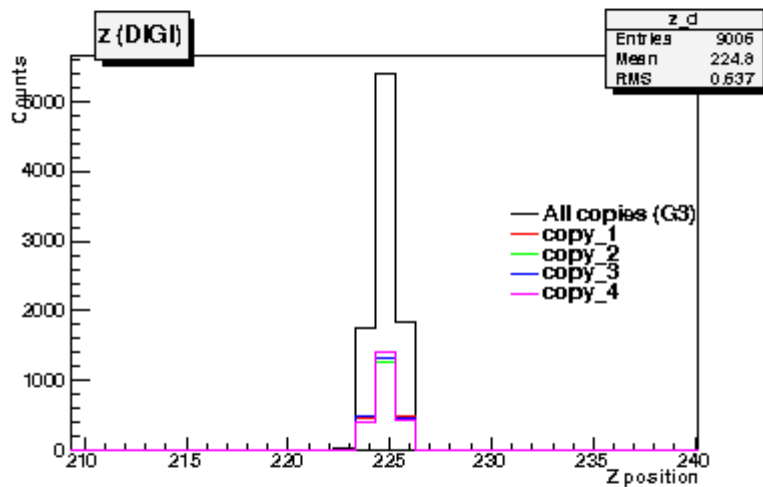
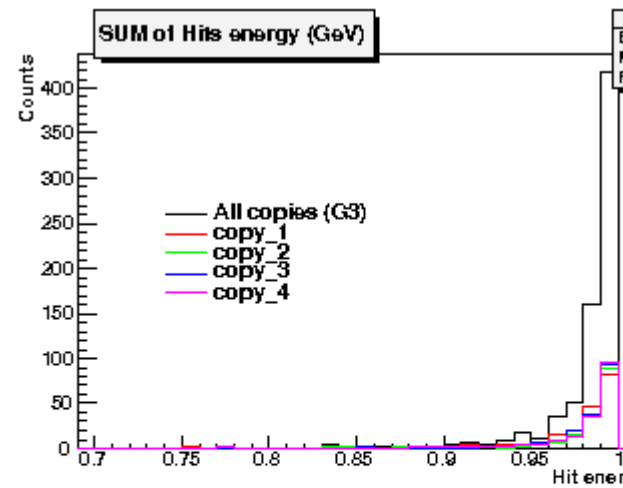
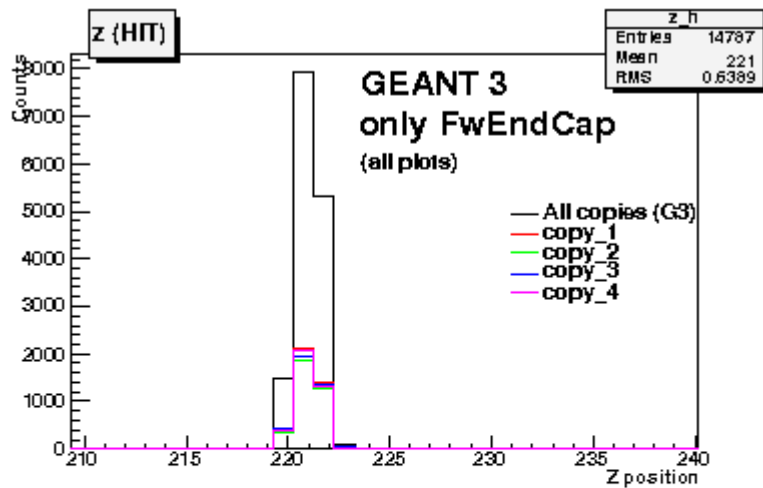
---

### File Attachments

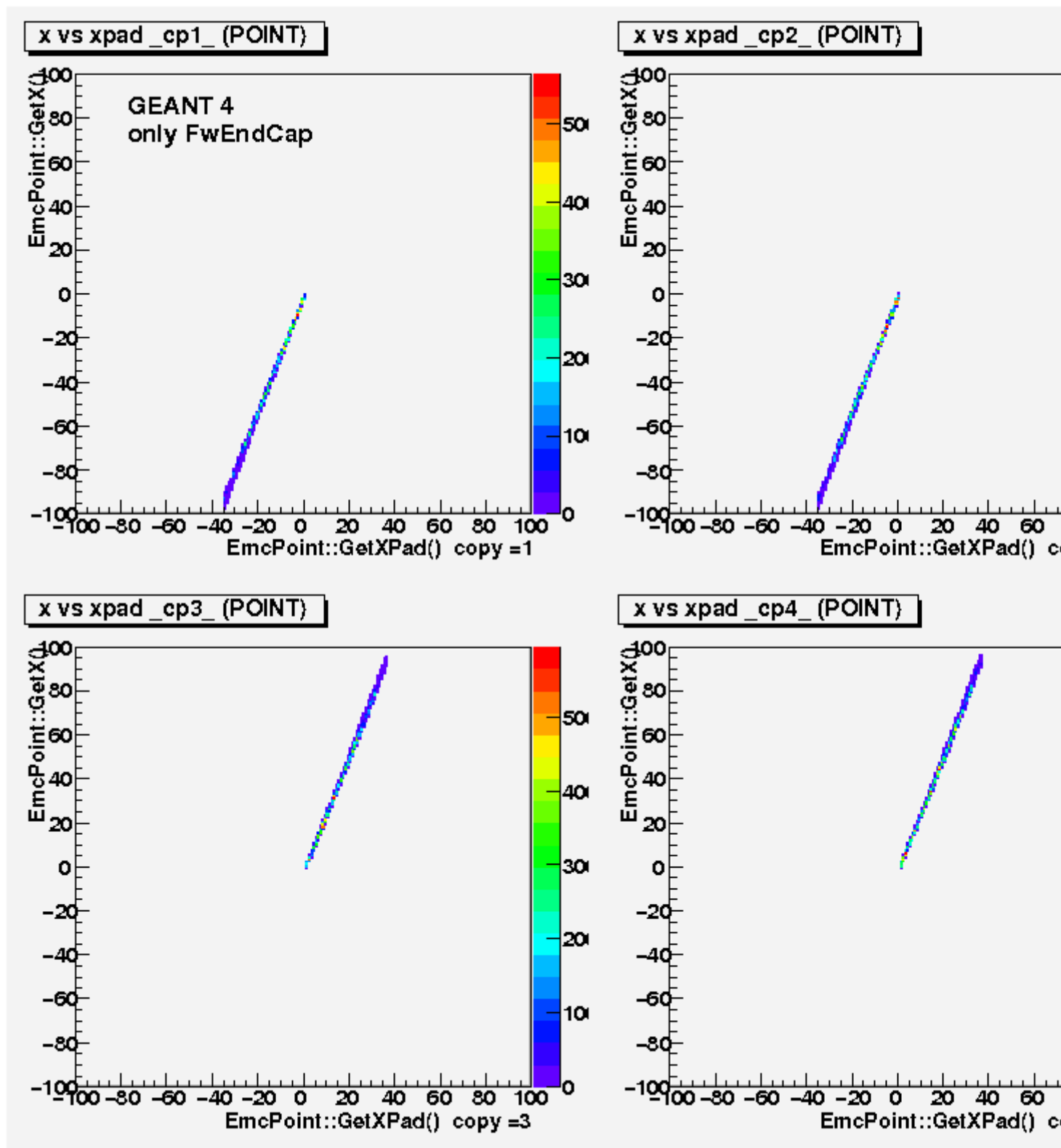
1) [z\\_ene\\_hits\\_digi\\_clusters\\_g4\\_fwendcap\\_m3changed\\_fixed.png](#),  
downloaded 633 times



2) [z\\_ene\\_hits\\_digi\\_clusters\\_g3\\_fwendcap\\_m3changed\\_fixed.png](#),  
downloaded 613 times

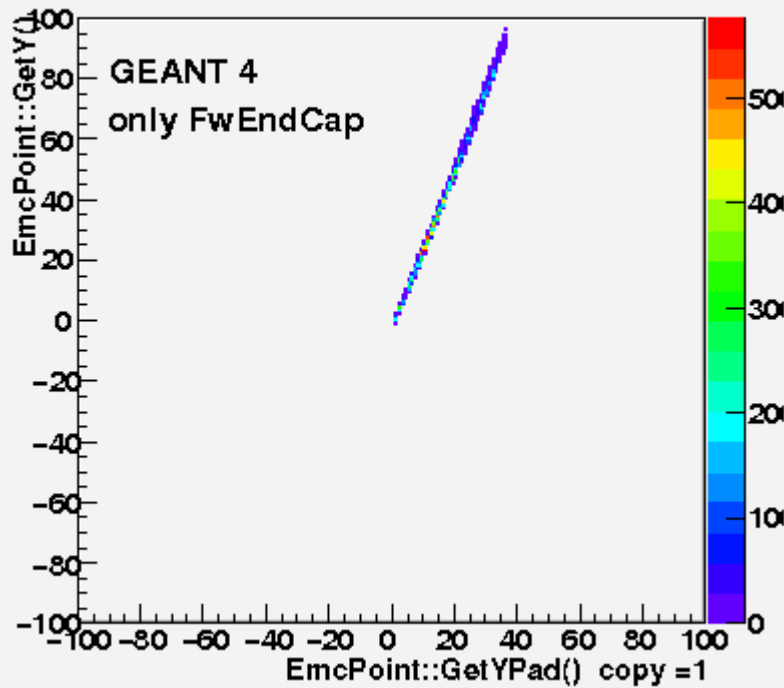


3) [xpad\\_x\\_points\\_m3\\_g4\\_fixed.png](#), downloaded 603 times

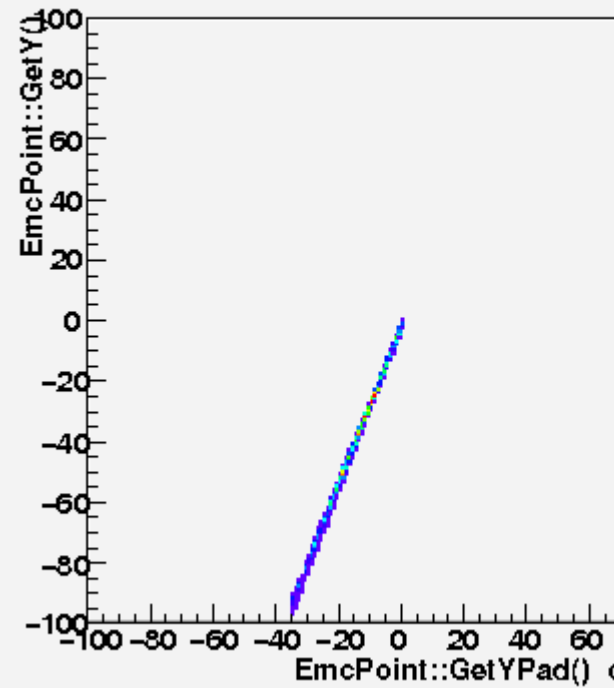


4) [ypad\\_y\\_points\\_m3\\_g4\\_fixed.png](#), downloaded 574 times

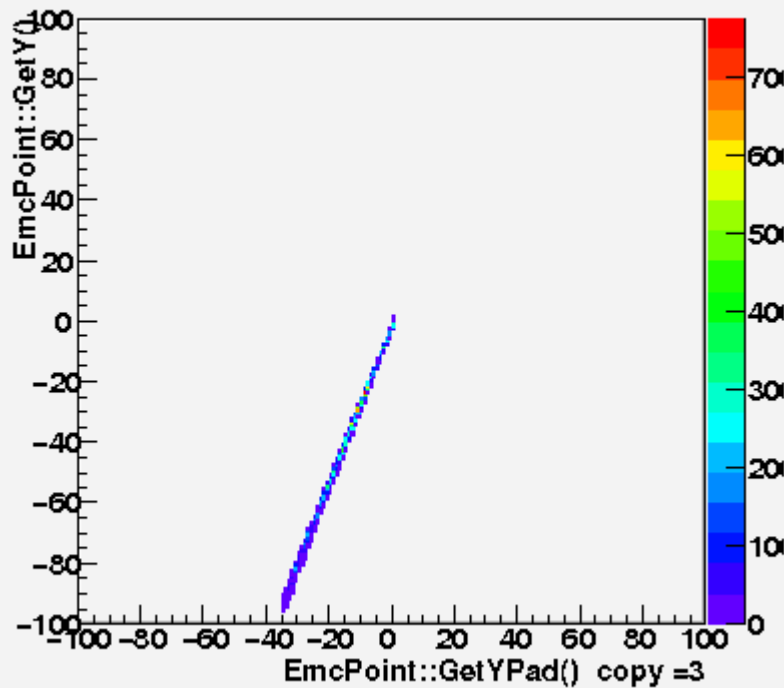
y vs ypad\_cp1\_ (POINT)



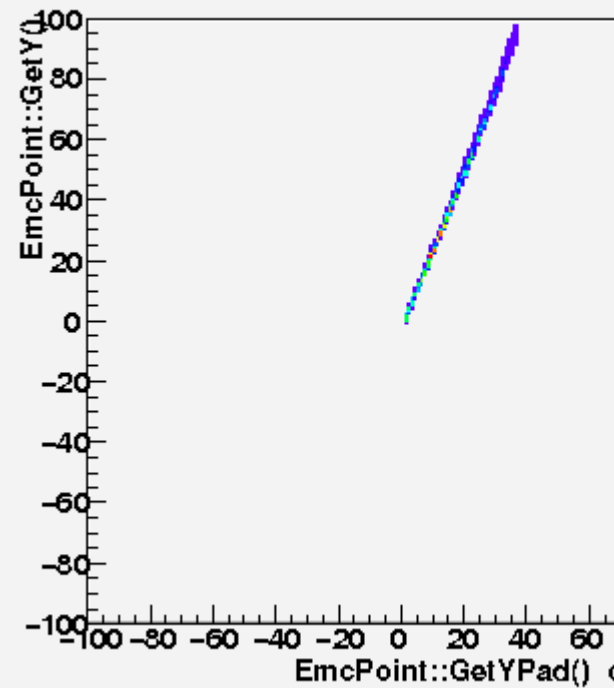
y vs ypad\_cp2\_ (POINT)



y vs ypad\_cp3\_ (POINT)

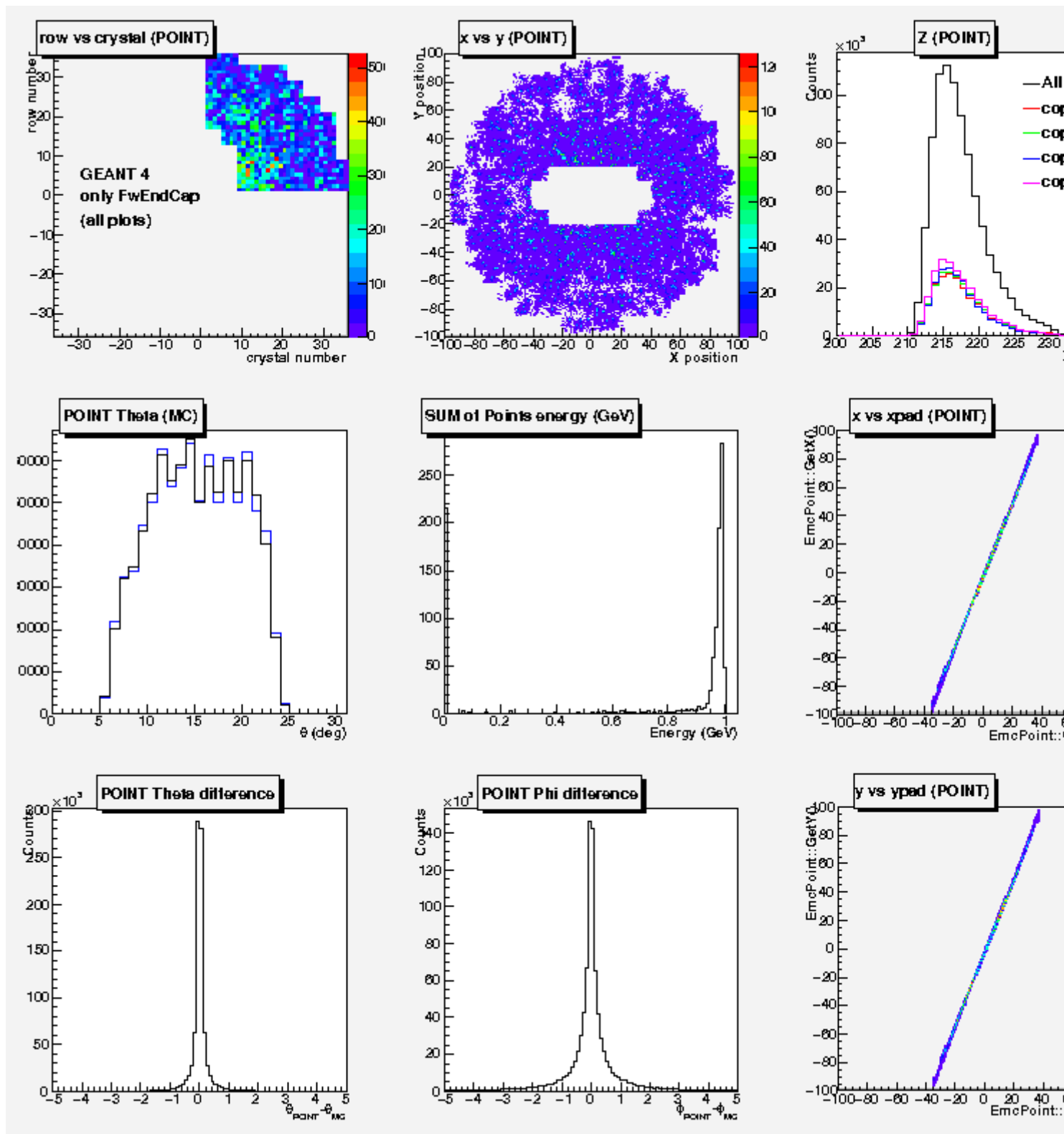


y vs ypad\_cp4\_ (POINT)

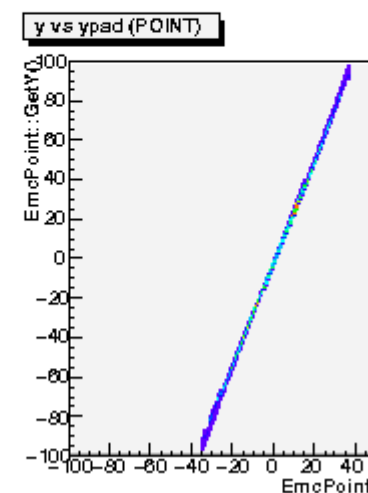
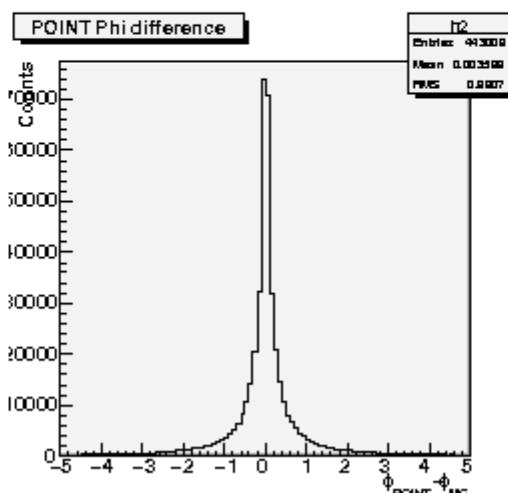
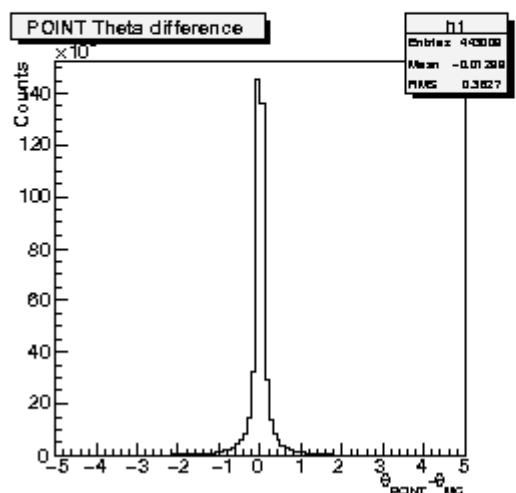
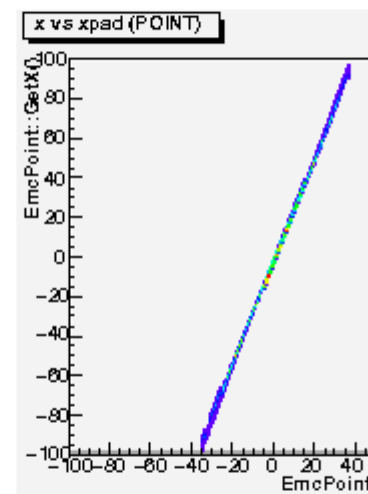
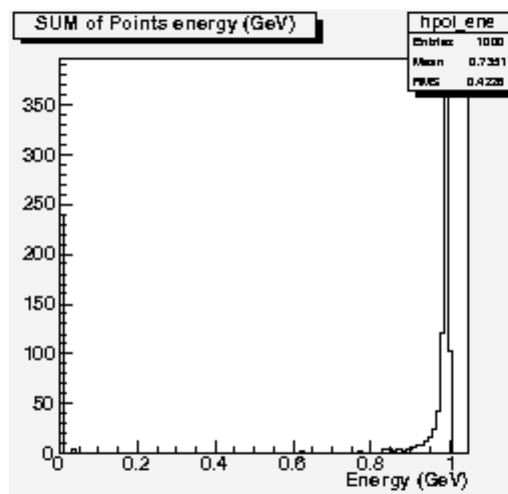
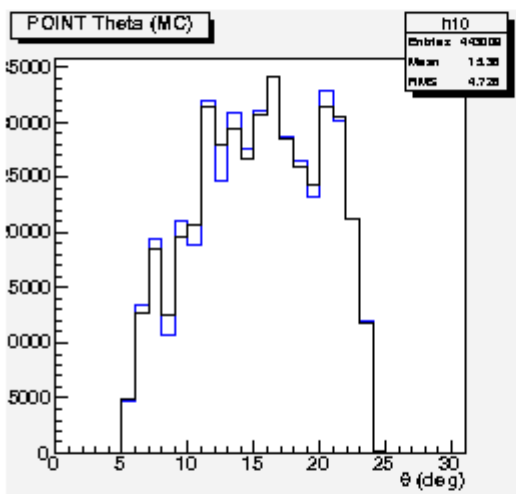
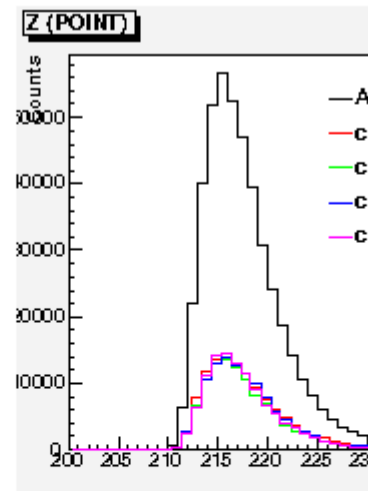
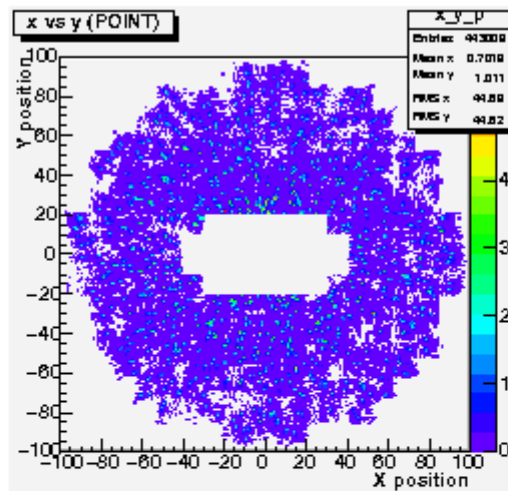
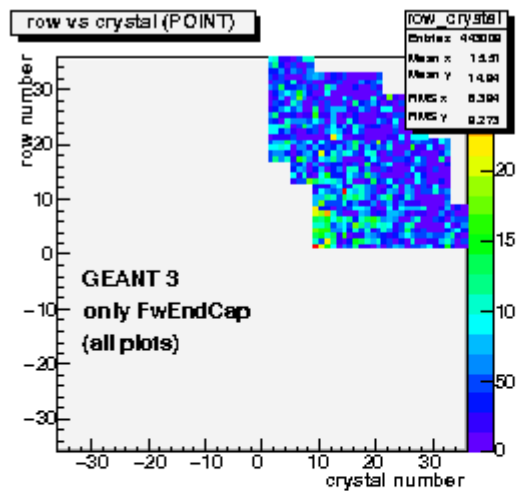


5) [points\\_g4\\_fwendcap\\_m3changed\\_fixed.png](#), downloaded 609 times





6) [points\\_g3\\_fwendcap\\_m3changed\\_fixed.png](#), downloaded 575 times



Subject: Re: forward endcap quest goes on  
 Posted by [Irina Brodski](#) on Wed, 08 Jul 2009 10:45:43 GMT  
[View Forum Message](#) <> [Reply to Message](#)

Hi,  
 i have just one more question. Maybe it was explained to me and i did not understand, but

where does the z-shift we see in

z\_ene\_hits\_digi\_clusters\_g4\_fwendcap\_m3changed\_fixed.png and  
z\_ene\_hits\_digi\_clusters\_g3\_fwendcap\_m3changed\_fixed.png

come from?

Thank you,  
Irina

---

Subject: Re: forward endcap quest goes on  
Posted by [mpeliz](#) on Wed, 08 Jul 2009 12:58:32 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hello Irina,

as Bertram mentioned in his previous posting the shower in a crystal starts not at the surface, but inside the crystal.

This shift is taken into account in the digitization. We add 6.3 cm to the position of the crystal in direction of the crystal axis. Therefore the EmcDigi is shifted with respect to the EmcHit.

Taking into account the  $\cos(\theta)$  the observed shift in Ola's plots for digis and hits is consistent with that.

At the moment I do not understand the shift between the digi and the cluster position. I will carefully check.

However, for the reconstruction we usually don't care about the z-position. We should check the reconstructed theta and phi angle in addition. Therefore one should look to the difference of the cluster position (theta, phi) wrt to the corresponding MC truth angles. This is replacing the points in the bottom left picture in `points_g4_fwendcap_m3changed_fixed.png` by the cluster. Ola could you change your macro and do these plots, please? BTW, is the macro in SVN? If not, could you check it in? This would be helpful for understanding the plots in detail.

Cheers,  
Marc

---

Subject: Re: forward endcap quest goes on  
Posted by [Aleksandra Biegun](#) on Thu, 09 Jul 2009 09:22:00 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi,

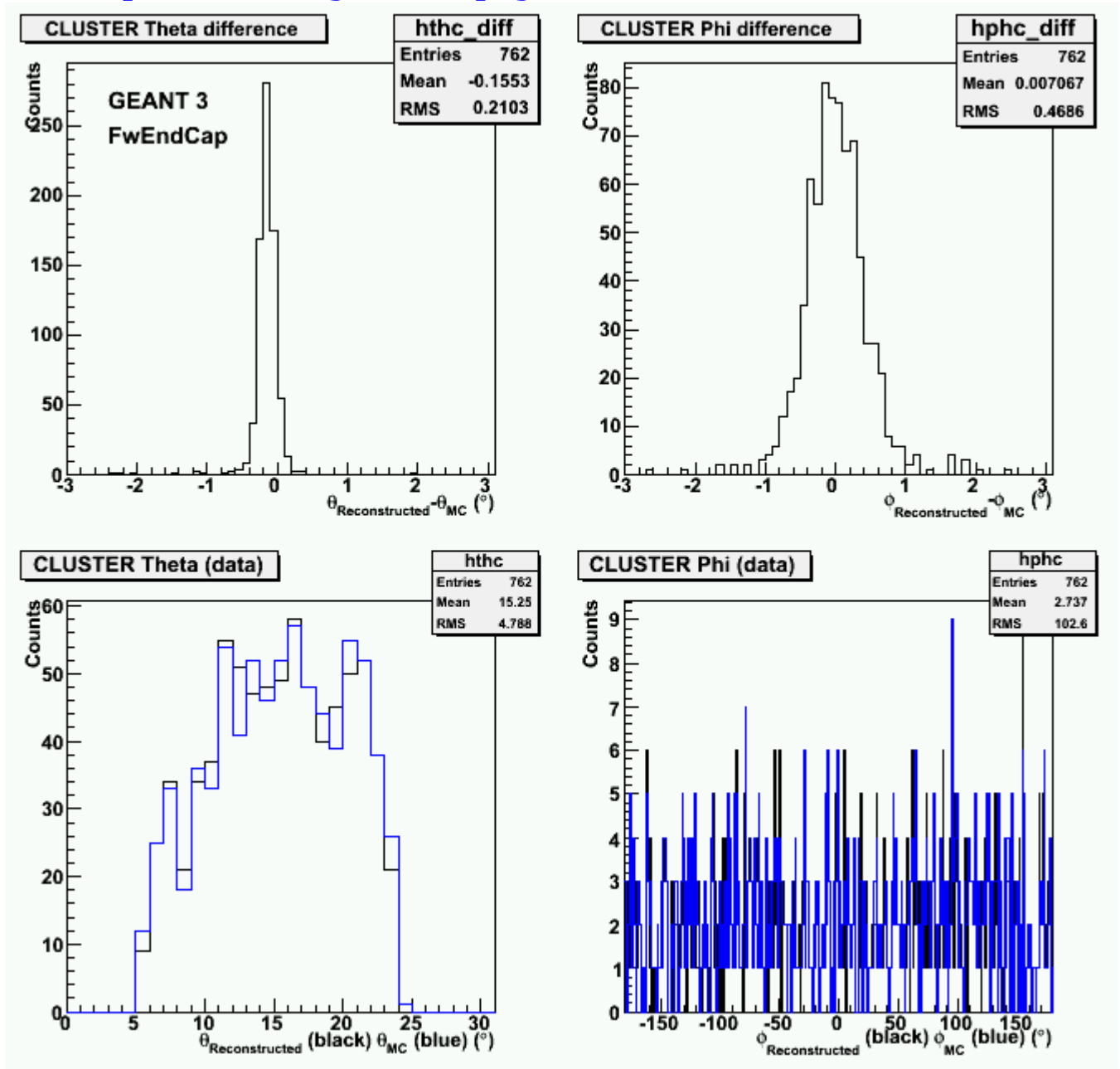
I have made plots for theta and phi difference for clusters in the forward end-cap, for GEANT 3 and GEANT 4. They are comparable.

I will send to svn the macro I am using for making these plots.

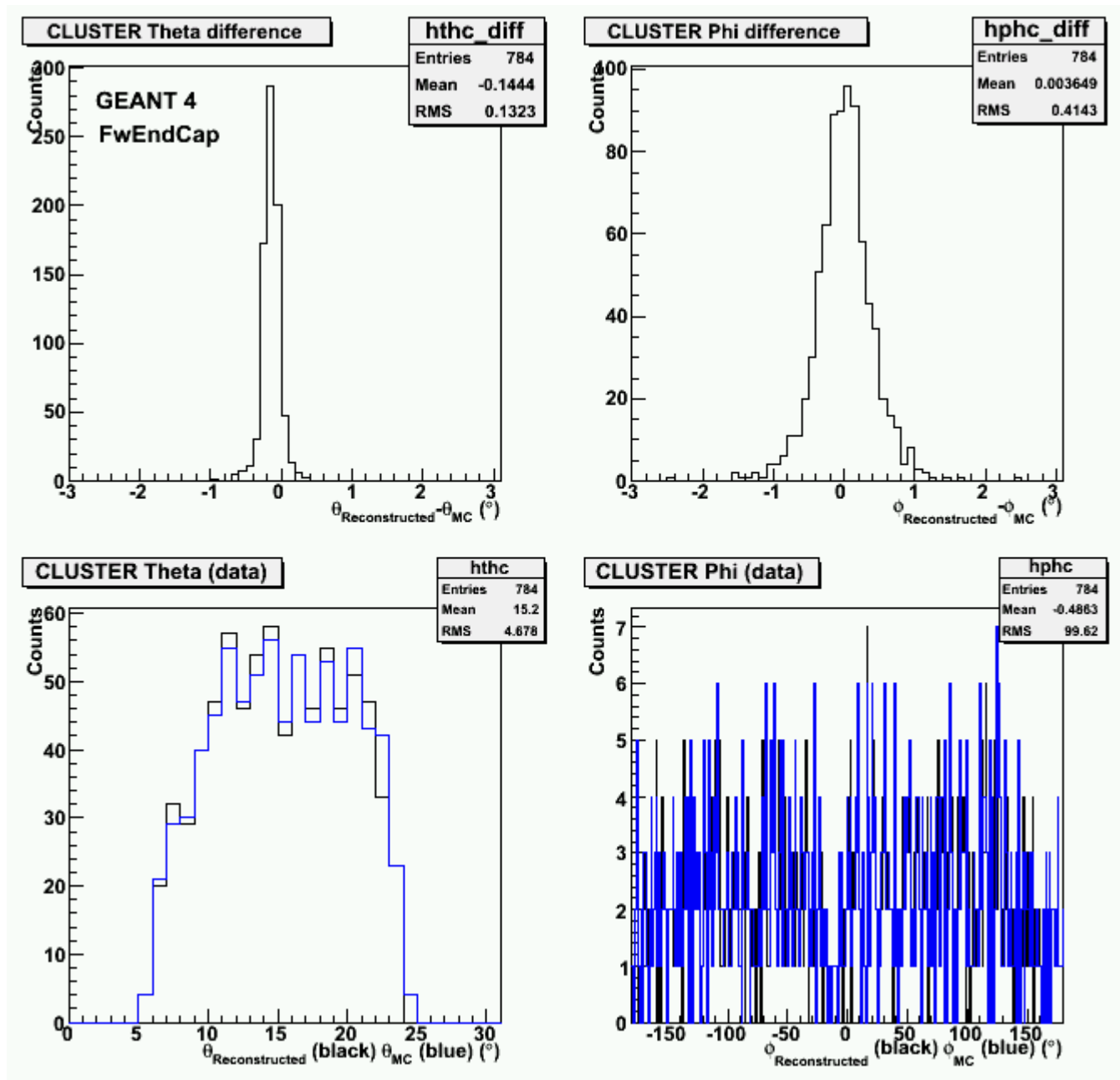
Best regards,  
Ola.

## File Attachments

1) [th\\_ph\\_cluster\\_g3\\_mod3.png](#), downloaded 593 times



2) [th\\_ph\\_cluster\\_g4\\_mod3.png](#), downloaded 582 times




---

Subject: Re: forward endcap quest goes on  
 Posted by [Stefano Spataro](#) on Thu, 09 Jul 2009 09:24:53 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

From the plots the shift in theta appears quite evident, probably related to the shift in Z.  
 Is it possible to solve this problem, somehow?

---



---

Subject: Re: forward endcap quest goes on  
 Posted by [Aleksandra Biegun](#) on Thu, 09 Jul 2009 13:43:43 GMT  
[View Forum Message](#) <> [Reply to Message](#)

---

Hi,

indeed, one can observe the shift of about 0.155 degree and 0.144 degree, for GEANT 3 and GEANT 4, respectively. In fact, there is a shift, but it is very small.

Besides, I added to ../trunk/macro/emc/  
2 macros I used to obtain plots I posted last days.

Names are:

anal\_point\_fwendcap.C

anal\_hit\_digi\_cluster\_fwendcap.C

Regards,  
Ola.

---