Subject: forward endcap quest goes on
Posted by Irina Brodski on Fri, 22 May 2009 12:56:52 GMT
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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 apears 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°, 0<phi<360°, 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 540 times
2) zEmcCluster_>Where.pdf, downloaded 538 times
3) xyzEmcHits.pdf, downloaded 539 times
4) zEmcHits.pdf, downloaded 560 times

Subject: Re: forward endcap quest goes on
Posted by Irina Brodski on Tue, 26 May 2009 13:21:54 GMT
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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 438 times

Subject: Re: forward endcap quest goes on
Posted by Irina Brodski on Tue, 26 May 2009 14:51:06 GMT
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File Attachments
1) maxandmin.pdf, downloaded 476 times

Subject: Re: forward endcap quest goes on
Posted by Bertram Kopf on Tue, 26 May 2009 21:04:14 GMT
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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
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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
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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

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 Reftection() 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 commited 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 Qarters, are shown at plots:

points_g4_fwendcap_m3changed_fixed.png - for GEANT 4

points_g3_fwendcap_m3changed_fixed.png - for GEANT 3.

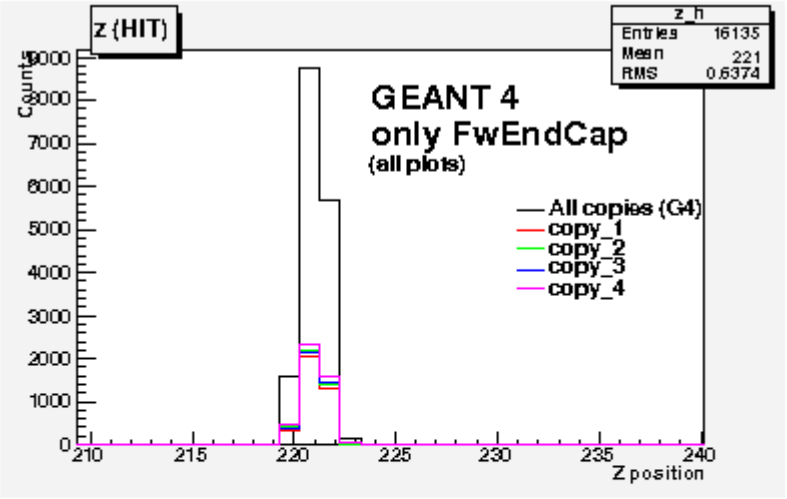
Irina, please check it.
I do hope there will not be any problem, but in case of any,
let me know.

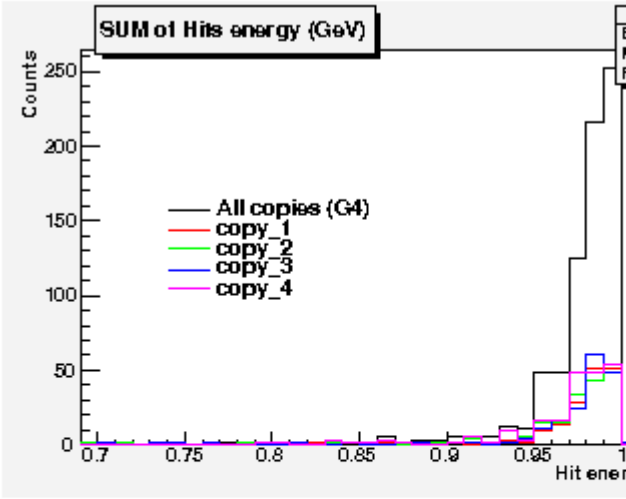
If you have any question, do not hesitate to ask.

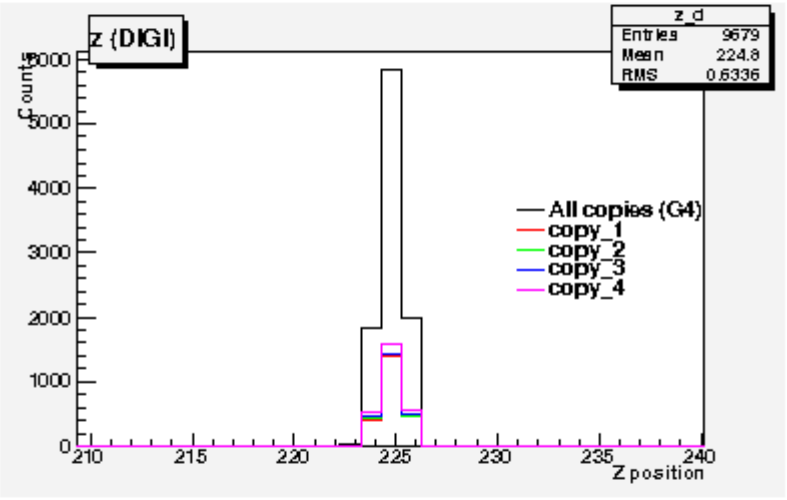
Best regards,
Ola.

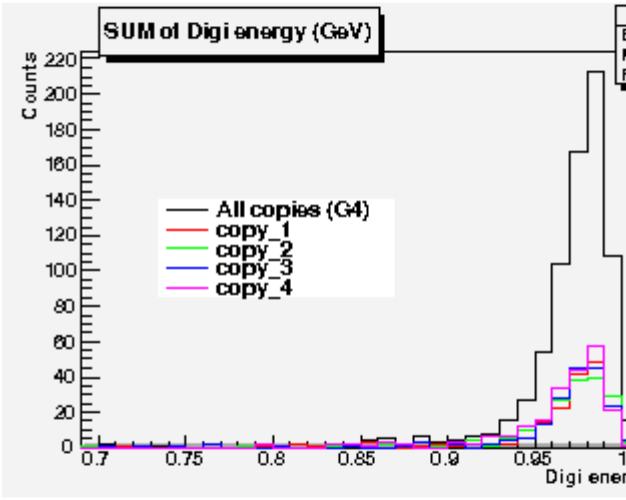
File Attachments

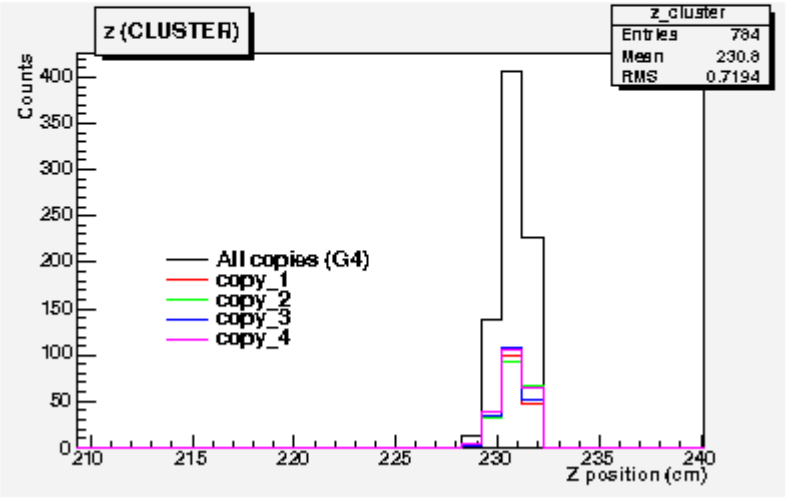
1) z_ene_hits_digi_clusters_g4_fwendcap_m3changed_fixed.png, downloaded 839 times

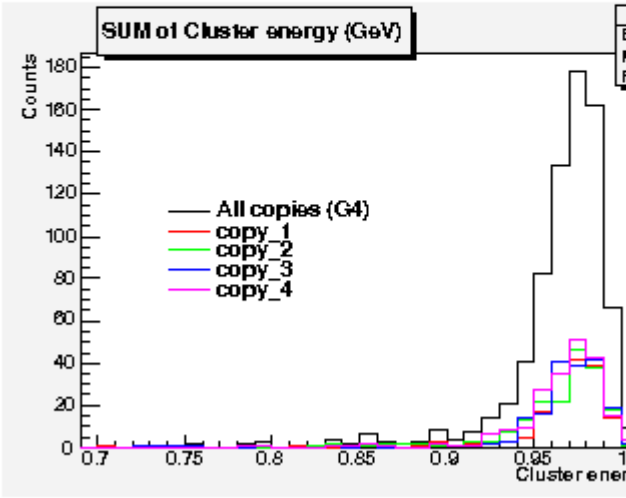




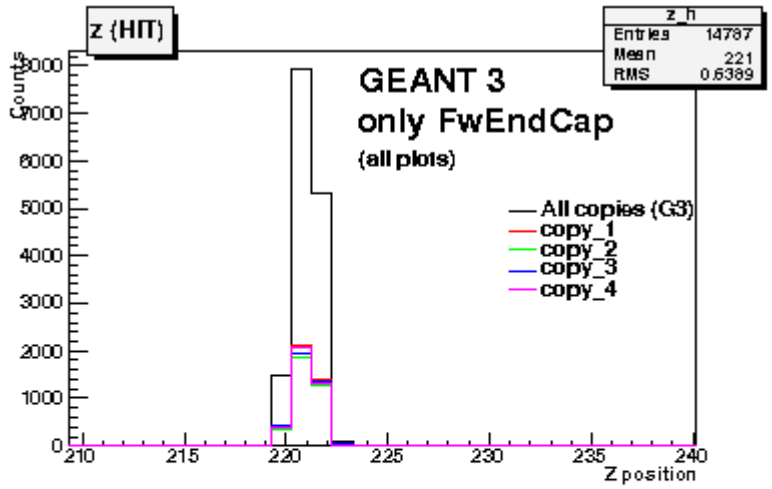


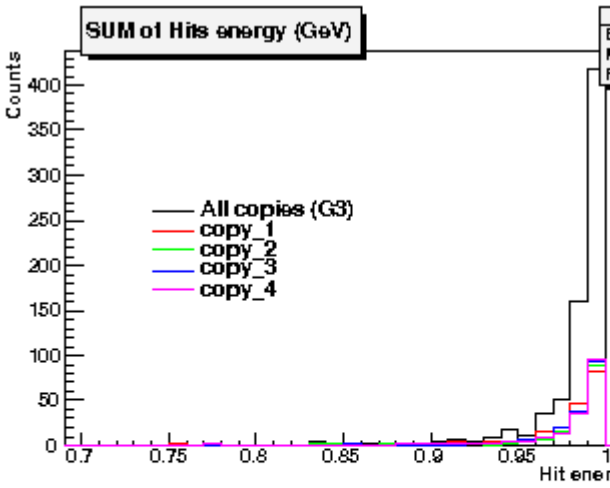


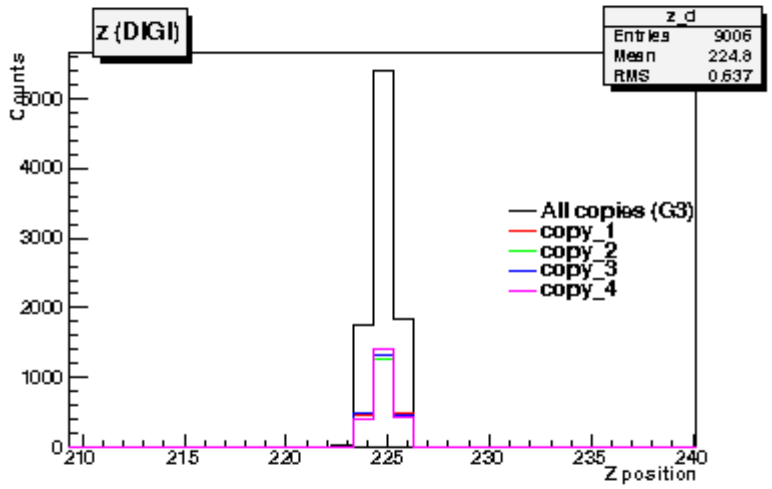


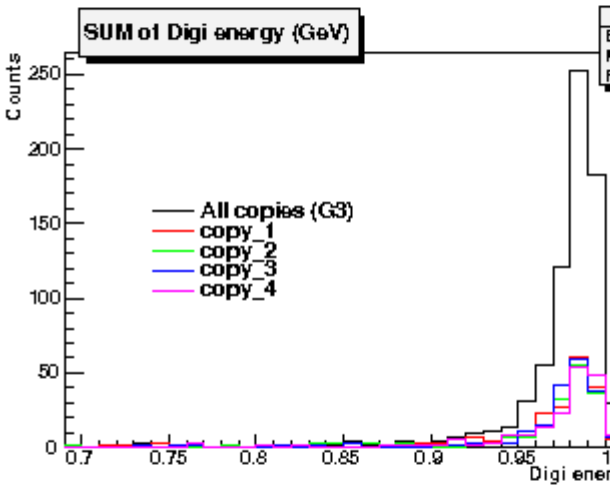


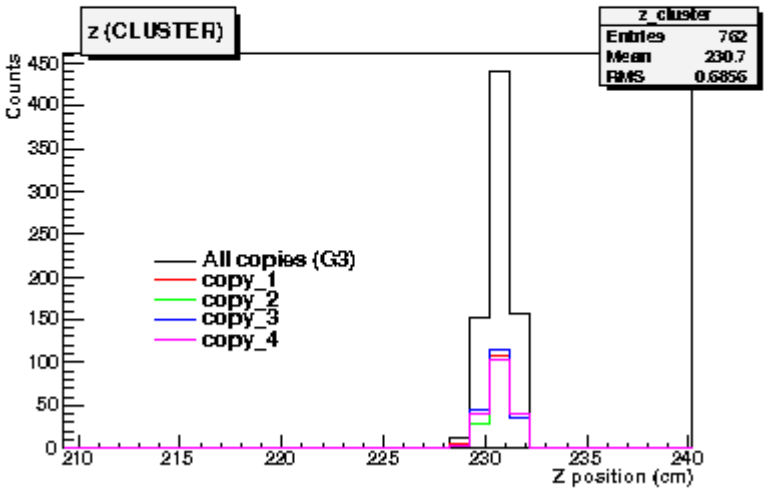
2) z_ene_hits_digi_clusters_g3_fwendcap_m3changed_fixed.png, downloaded 827 times

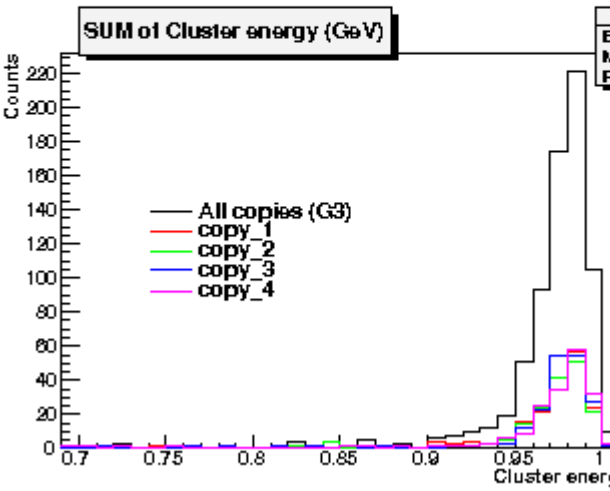




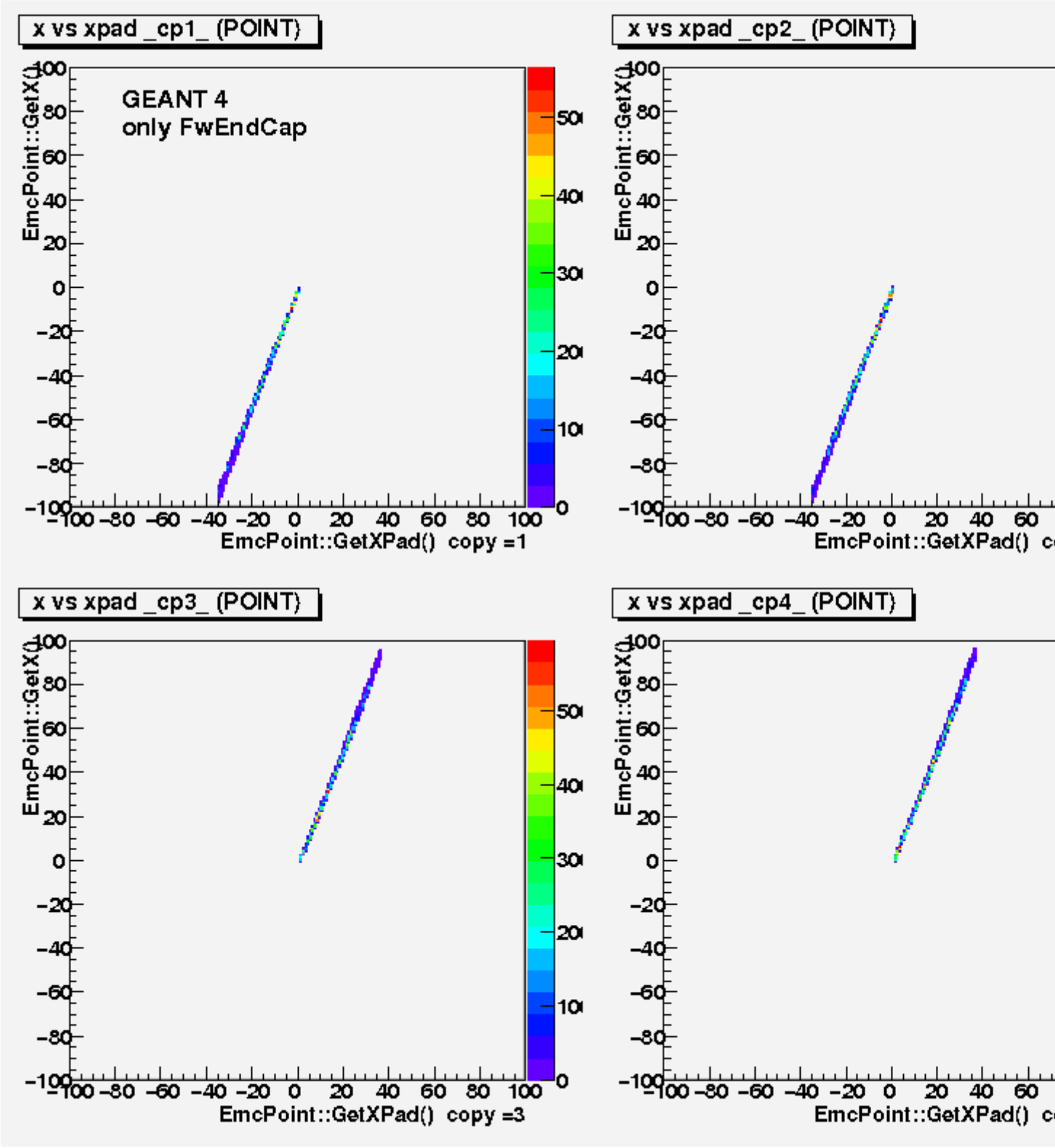




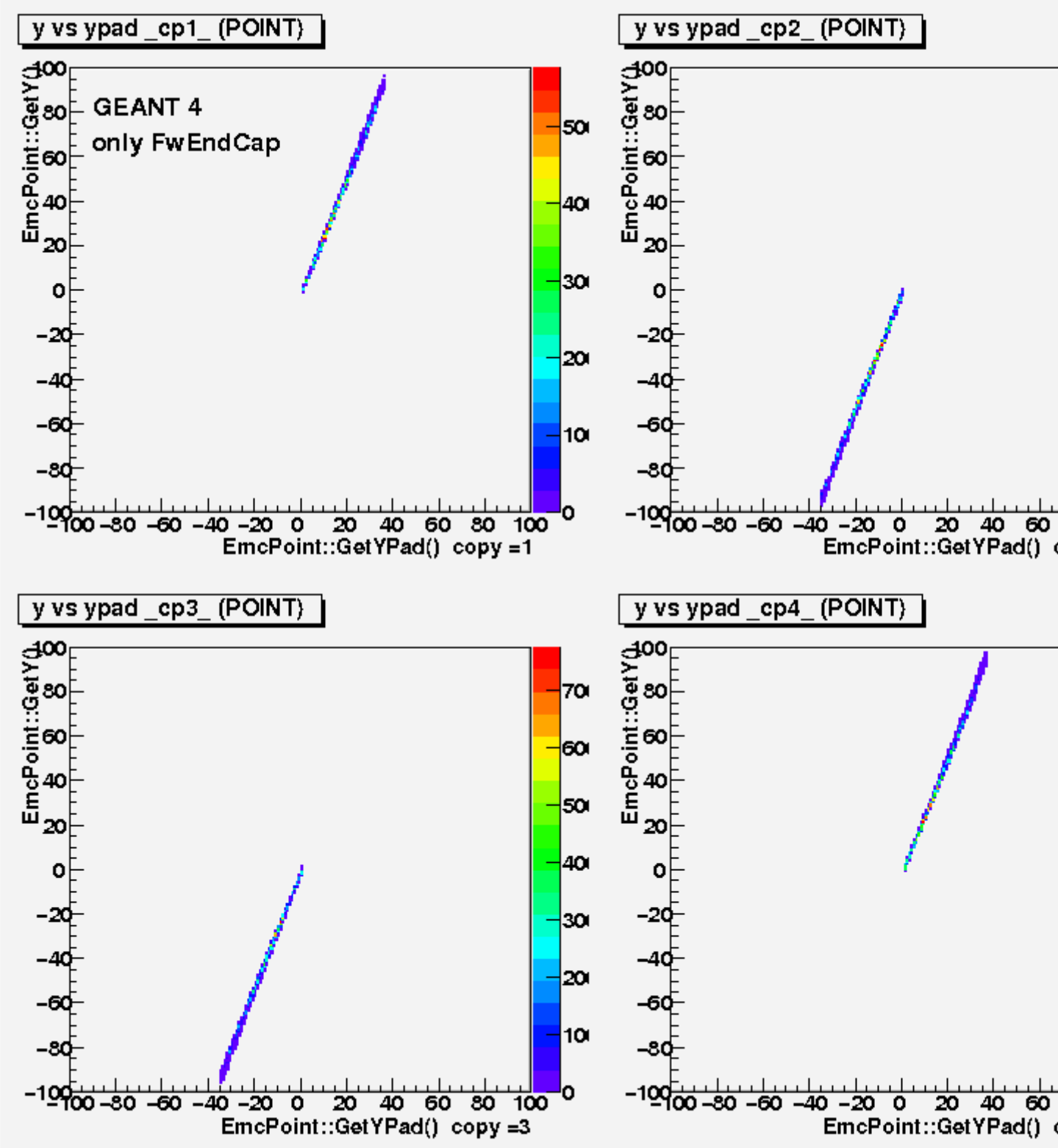




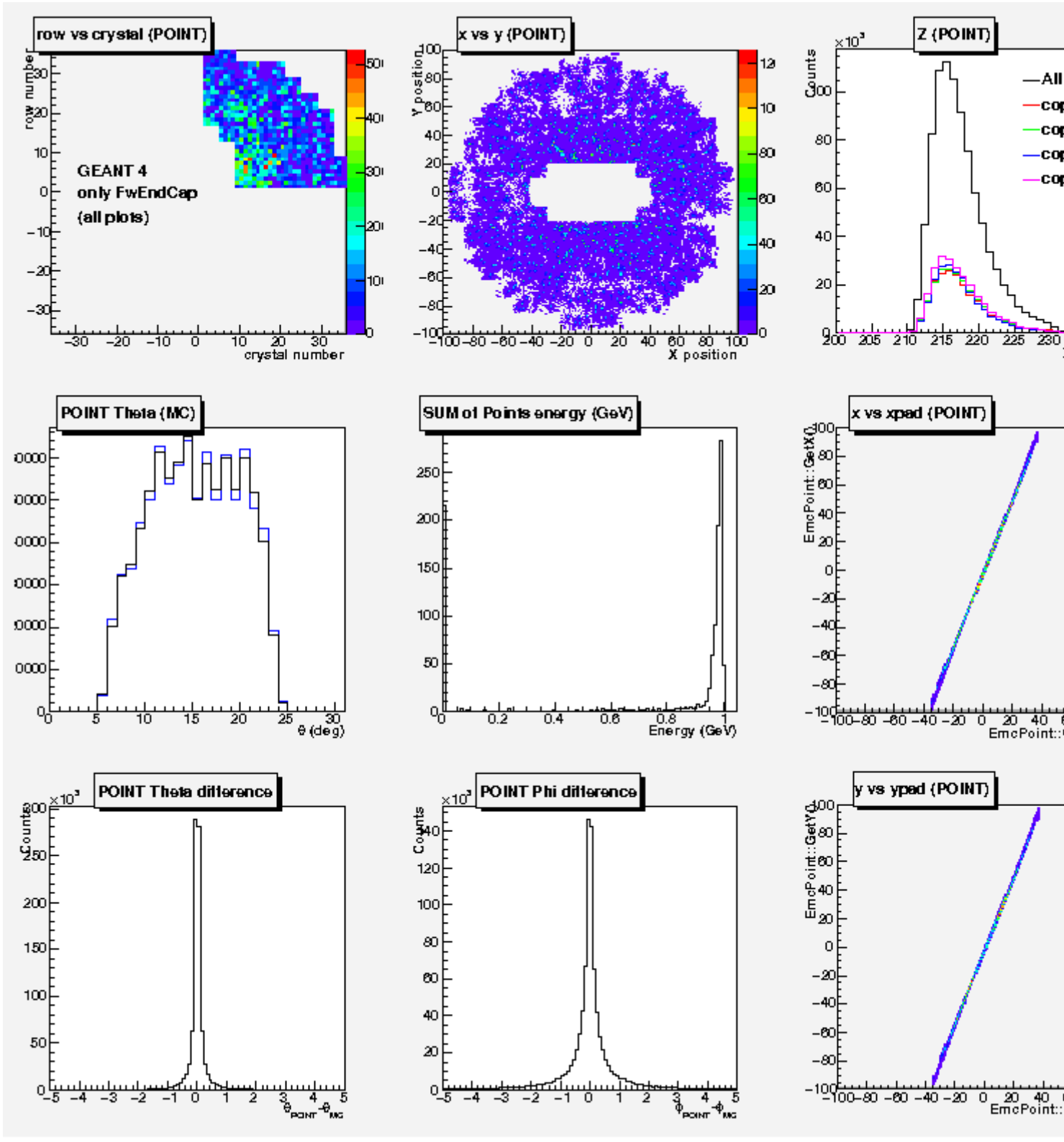
3) xpad_x_points_m3_g4_fixed.png, downloaded 812 times



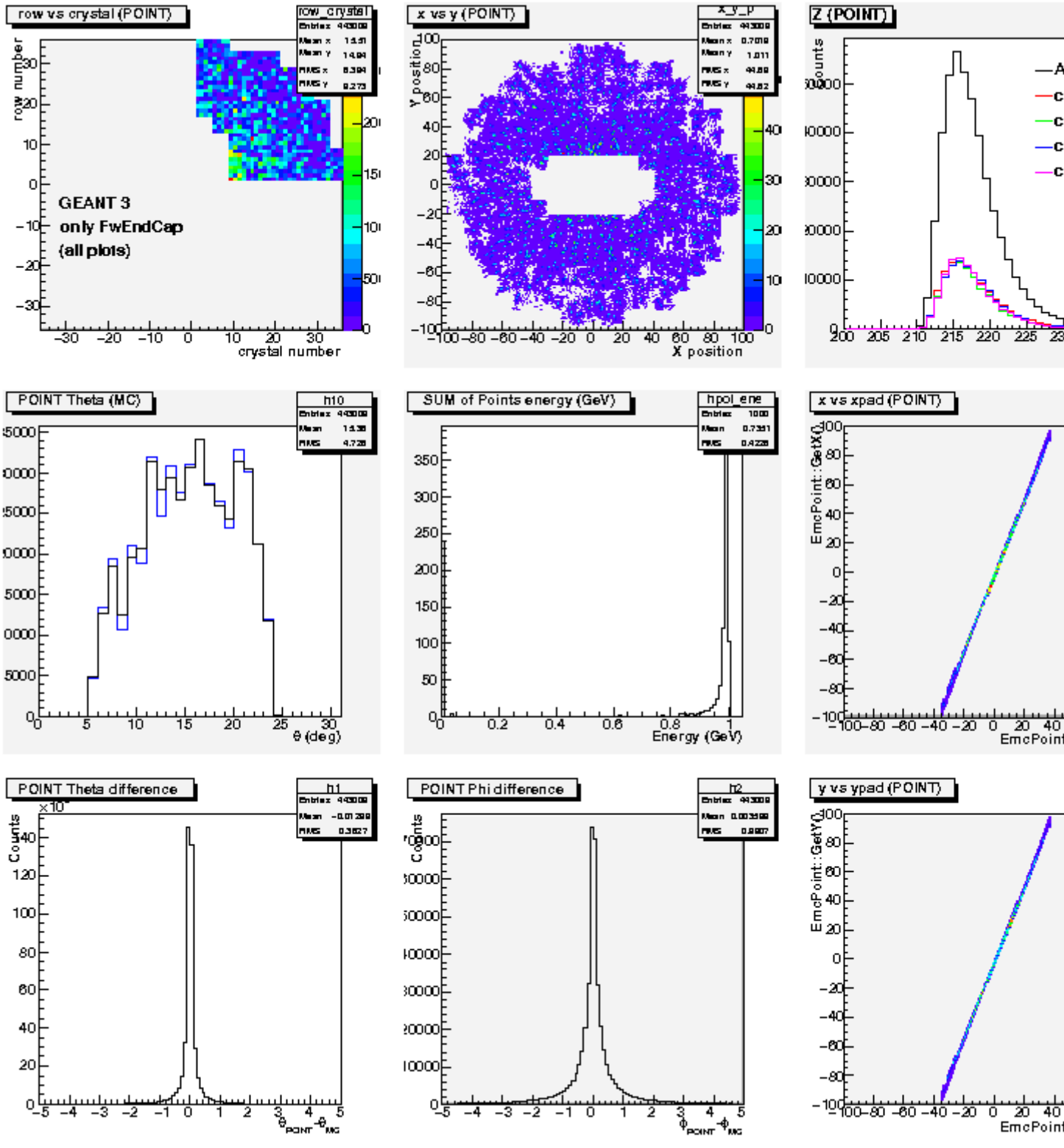
4) ypad_y_points_m3_g4_fixed.png, downloaded 790 times



5) points_g4_fwendcap_m3changed_fixed.png, downloaded 770 times



6) points_g3_fwendcap_m3changed_fixed.png, downloaded 727 times



Subject: Re: forward endcap quest goes on
Posted by Irina Brodski on Wed, 08 Jul 2009 10:45:43 GMT
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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
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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
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Hi,

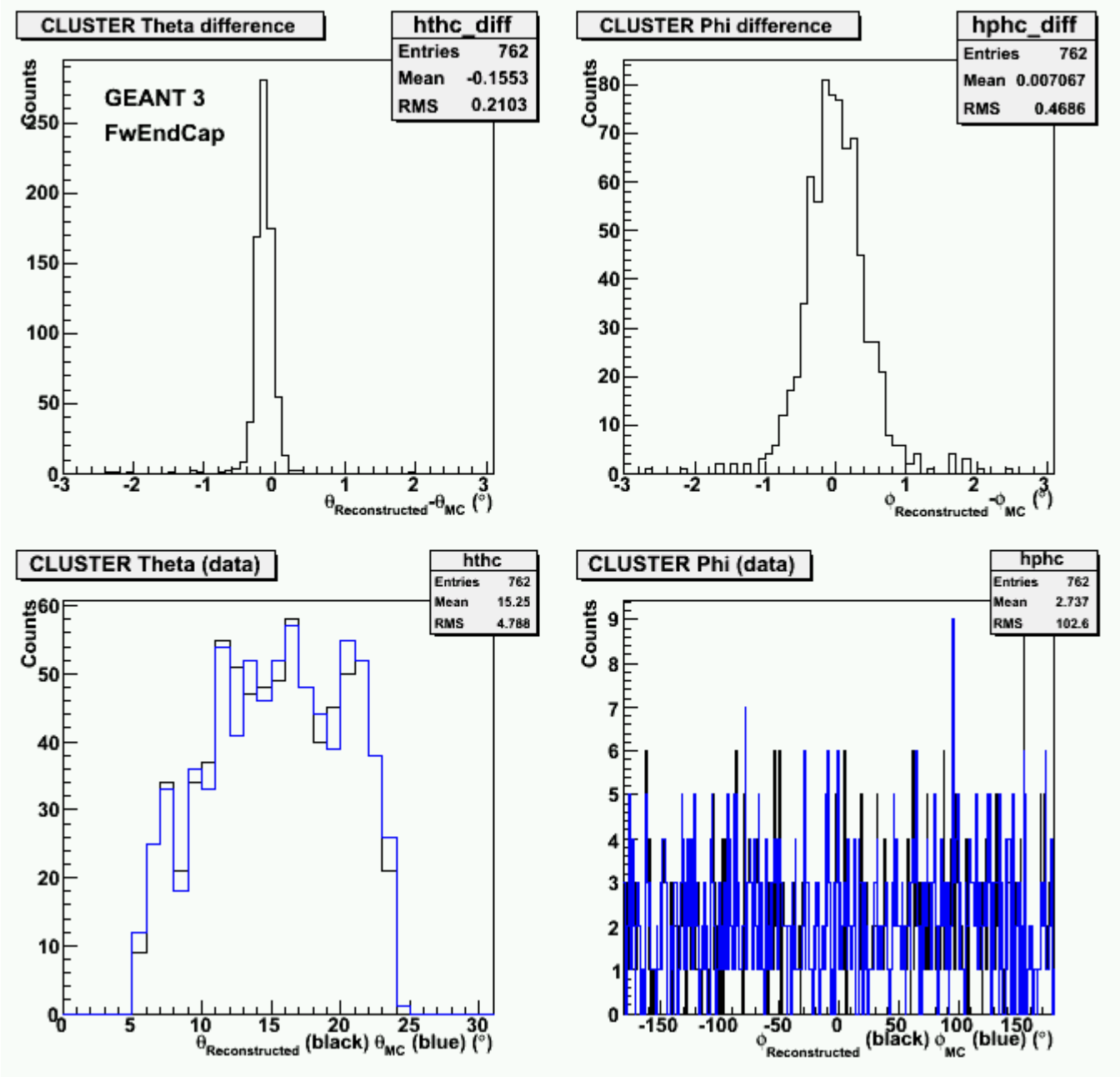
I have made plots for theta and phi difference for clusters
in the forward end-cap, for GEANT 3 and GEANT 4.
They are comparable.

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

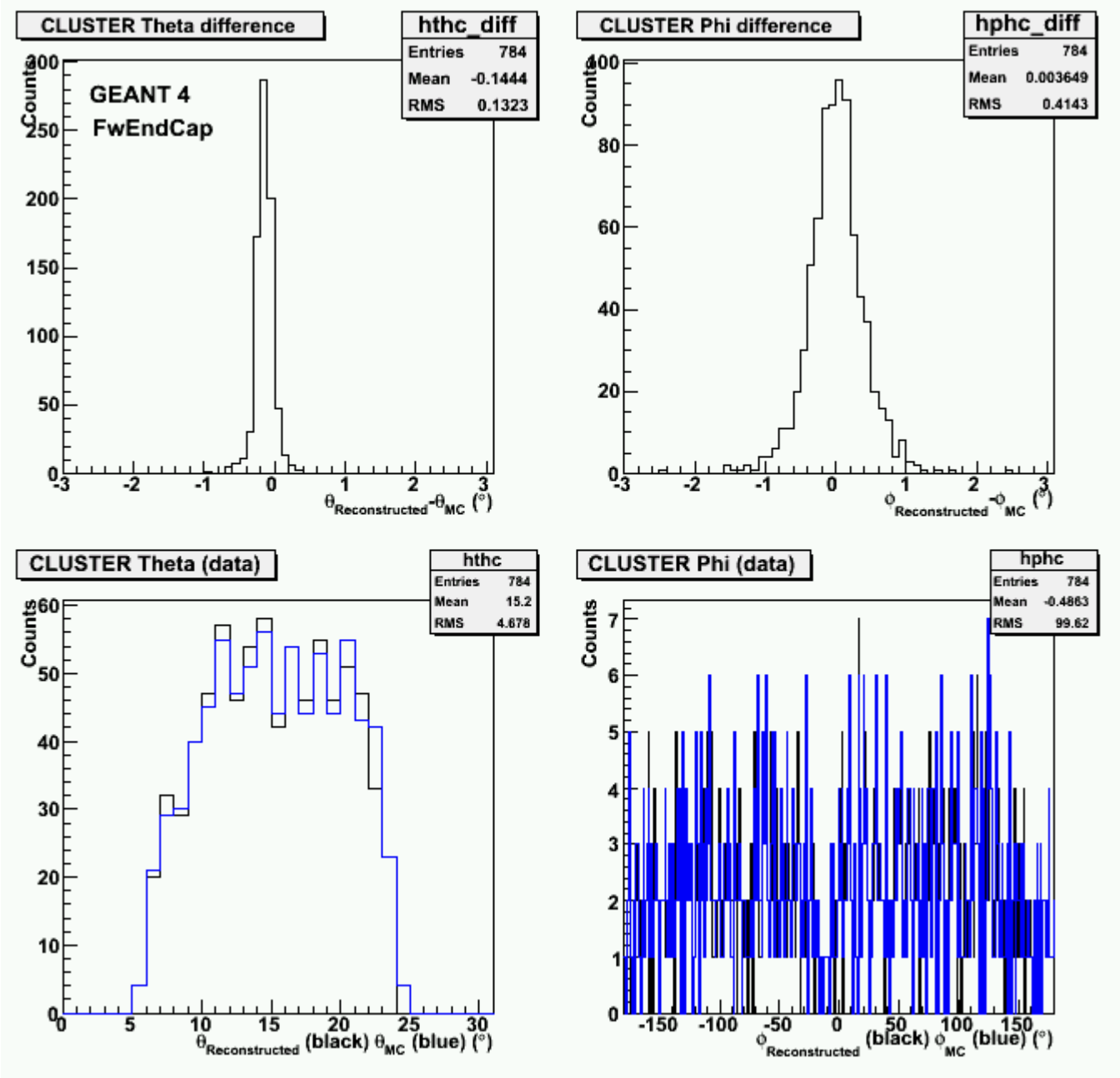
Best regards,
Ola.

File Attachments

1) th_ph_cluster_g3_mod3.png, downloaded 799 times



2) th_ph_cluster_g4_mod3.png, downloaded 786 times



Subject: Re: forward endcap quest goes on
Posted by StefanoSpataro on Thu, 09 Jul 2009 09:24:53 GMT
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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
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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.
