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Subject: Question about emc crystal numbering

Posted by [Jens Sören Lange](#) on Tue, 28 Jul 2009 13:59:34 GMT

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Hi all,

2 questions concerning emc crystal numbering.

Question #1:

in trunk/emc/EmcData/PndEmcHit.h

```
Short_t GetCrystal() const { return (fDetectorID%10000)    ;}
```

the crystal is the smallest unit (and not e.g. the "module"),  
so is the factor 10000 really correct here?  
(or should it just return fDetectorID ?)

in other words, like this it only returns 1-digit "1, 2, ..."  
for fired crystal numbers and not 5-digit numbers.

Question #2:

when investigating fDetectorID (e.g. for the E=1 GeV photons  
from sim\_emc.C using hit\_analys.C) it turns out that it has  
has positive and \_negative\_ 5-digit integer detector numbers.

Any idea why negative?

cheers, Soeren

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Subject: Re: Question about emc crystal numbering

Posted by [Stefano Spataro](#) on Tue, 28 Jul 2009 14:40:28 GMT

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Hi,

in PndEmc there is the definition of fDetectorID:

```
fVolumeID = nMod*100000000 + nRow*1000000 + copyNo*10000 + nCrys;
```

the crystals are divided in GetCrystal and GetRow (like theta and phi, or x and y), then 10000  
is correct.

About the second question, with the endcaps the structure was changed many times since  
when I have written the code for the first time, it is possible that for some module the  
propagation of fDetectorID is wrong (crystals and row should be always positive).  
Could you please check for which modules you have such negative numbers?

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Subject: Re: Question about emc crystal numbering  
Posted by [Jens Sören Lange](#) on Wed, 29 Jul 2009 13:47:22 GMT  
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i can confirm that it happens for all modules 1,2,3,4,5.  
about ~50% of all fDetectorID are negative,  
and it happens in >90% of all events.  
(there is no hit->GetDetectorID(), so maybe it was just not noticed before)

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Subject: Re: Question about emc crystal numbering  
Posted by [mpeliz](#) on Wed, 29 Jul 2009 20:27:50 GMT  
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Hi Soeren,

I was not able to reproduce your problem with my installed trunk corresponding to SVN revision 6081. I runned emc\_sim.C, emc\_hit.C and emc\_analys.C on 1000 events. Both the PndEmcHitProducer::AddHit and the inherited FairHit::GetDetectorID methods always yield positive integer values.

What did I do different? Just for the record: I compiled, linked and ran on SL4. Any ideas to nail the problem down?

Best regards,  
Marc

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Subject: Re: Question about emc crystal numbering  
Posted by [StefanoSpataro](#) on Thu, 30 Jul 2009 07:03:22 GMT  
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I have tried also in my computer, and all the detectorID of both EmcPoint and EmcHit are correctly positive.

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Subject: Re: Question about emc crystal numbering  
Posted by [Jens Sören Lange](#) on Thu, 30 Jul 2009 13:26:23 GMT  
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I tried like this: (in PndEmcHit.h)

```
Short_t GetCrystal() const { return (fDetectorID) ;};
```

can it be that fDetectorID itself is calculated using GetCrystal() ?  
(so that I created a recursion this way which then produces  
the negative numbers somehow?)

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Subject: Re: Question about emc crystal numbering  
Posted by [Stefano Spataro](#) on Thu, 30 Jul 2009 13:51:29 GMT  
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fDetectorID is created at the simulation point (PndEmc), taking all the crystal numbers from the geometry volume.

After, this number is propagated into EmcHit/Digi and so on. The functions GetRox(), GetCrystal(), getCopy(), GetModule(), GetXPad() and GetYPad() use only fDetectorID, and if you do not use explicitly the command SetDetectorID(), you cannot change that number.

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