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Subject: How to get the orientation of a detector element?

Posted by [HosseinMoeini](#) on Thu, 10 Feb 2011 16:16:22 GMT

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Dear all,

I was wondering if there's an easy way of retrieving the orientation of a crystal (say, theta and phi) in the pandaroot framework? Using PndEmcHit class, I can get the position and orientation of the center of the crystal.

In order to get the orientation of the crystal itself, I can use the position (x0,y0,z0) of the center of the crystal as well as the position of the center of the, say, front face of the crystal (x1,y1,z1) to obtain the direction of the vector (x1-x0,y1-y0,z1-z0). But then I would need to somehow get the position of the center of the front face of the crystal. And this I don't know how to do!

It would be nice if somebody could help me on this matter.

cheers,  
Hossein

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Subject: Re: How to get the orientation of a detector element?

Posted by [StefanoSpataro](#) on Thu, 10 Feb 2011 16:37:23 GMT

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Hi,

the following code was used some time ago for MVD, before using the geometry handler. Maybe it could be useful in your case, remember that EMC crystals are not TGeoBBox but something else (TGeoTrap?)

```
TVector3 mvdPos;  
mvdHit->Position(mvdPos);
```

```
TGeoNode *mvdNode = (TGeoNode*)gGeoManager->FindNode(mvdHit->GetX(),  
mvdHit->GetY(), mvdHit->GetZ());  
TGeoVolume *mvdVol = (TGeoVolume*)mvdNode->GetVolume();  
TGeoBBox* actBox = (TGeoBBox*)(mvdVol->GetShape()); // volume of the MVD strip/pixel  
TGeoMatrix* mvdGeoRot = (TGeoMatrix*)mvdNode->GetMatrix();  
const Double_t *rotM = mvdGeoRot->GetRotationMatrix();
```

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Subject: Re: How to get the orientation of a detector element?

Posted by [Dima Melnychuk](#) on Thu, 10 Feb 2011 21:22:32 GMT

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Hi Hossein,

To retrieve orientation of a crystal in pandaroot framework you can use the PndEmcStructure class which actually extract information on position and orientation of the crystals from the root geometry to provide it for reconstruction algorithm.

In this class the map is filled fTciXtalMap between the crystal index presented in the form of PndEmcTwoCoorIndex (tci) object and PndEmcXtal which provide different method to access

position and orientation of the crystal. I suppose

```
TVector3 PndEmcXtal::normalToFrontFace()
```

return something you want.

You can look into `PndEmcClusterProperties::LiloWhere()` to see how it is actually used.

And there could be the difference to call it within the task or in macro, in the `PndEmcClusterProperties::LiloWhere()` it is called within the task and in macro I can foresee additional complications.

If this hint does not help, let me know and will try to provide more detailed example.

Best regards,

Dima

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Subject: Re: How to get the orientation of a detector element?  
Posted by [HosseinMoeini](#) on Wed, 16 Feb 2011 13:15:47 GMT  
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Dear Dima and Stefano,  
Thank you so much for your extended answers! My problem is solved for the moment.

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