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Subject: Digitization and Reconstruction in Fairroot to new detectors  
Posted by [Raghav Kunnawalkam](#) on Wed, 27 Jun 2012 17:16:34 GMT  
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Hi All

I just understood today that if you have to do digitization to look at the detector response then you have to create a bunch of classes for its digitization and reconstruction. (like how it is given in pandaroot)

If we look at EMC in panda for example, it has a bunch of classes under EmcDigi, EmcReco, etc.. which i think are necessary for doing reconstruction.

I just followed the procedure given in the fairroot.gsi.de website for creating my own detector and i only have few classes like fairemca.cxx, fairemcacontfact.cxx, fairemcageo.cxx, fairemcageopar.cxx, fairemcapoint.cxx.  
(if we say that i named my detector as Emca)  
So if i need to do any sort of reconstruction on this particular detector which is actually my ElectroMagnetic CALorimeter (EMCA), then i need all the classes present in /pandaroot/emc/ ?

I will work on getting the classes and renaming them and all that but i want to know if it is standard procedure.

Has anyone done reconstruction/ digitization from the very beginning so that they can tell me the steps to follow. I also know that i need to create a parameter file which has information for digi and reco. I went through some of the parameter files in /pandaroot/macro/params and i see that there are certain parameters for certain detectors and some others for other detectors. I want to know if there is like a manual of some sort telling me all the possible parameters and if there is like a default configuration that i can use for the time being.

Also i learnt from Florian today that i can do a "simple smearing" of the MCPPoint, as a first step. But i dont know how to go about doing that in my digi macro. Is there an example or something like that available online in the repository?

Thanks a lot guys.  
Cheers  
Raghav

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Subject: Re: Digitization and Reconstruction in Fairroot to new detectors  
Posted by [StefanoSpataro](#) on Wed, 27 Jun 2012 17:24:30 GMT  
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You need only one data object and one task. I suggest to look at the emc hit and the emc hit producer. All the other classes are not needed.

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Subject: Re: Digitization and Reconstruction in Fairroot to new detectors

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Posted by [Raghav Kunnawalkam](#) on Wed, 27 Jun 2012 17:53:32 GMT  
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Hi Stefano

Ok, so the hit producer calculates the hit for my detector and converts it into actual data based on the geometry defined in emcstructure.cxx. So if i just create these classes and also the ones they depend on, then i should be good to do some digi right? is this what Florian ment by doing simple smearing, or is it something else.

I also want to know what the nonuniformityfile is. In the beginning of emchitproducer, you create a constructor with that particular file in it /input/EmcDigiNoniformitypars.root

also is there a macro available that utilizes these classes to create the digi file?

Thanks a lot  
Cheers  
Raghav

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Subject: Re: Digitization and Reconstruction in Fairroot to new detectors  
Posted by [StefanoSpataro](#) on Wed, 27 Jun 2012 18:42:07 GMT  
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You don't need structure or other params, you can delete all those things and edit the process hits as you wish. Maybe the mdt hit producer is easier to understand.

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Subject: Re: Digitization and Reconstruction in Fairroot to new detectors  
Posted by [Raghav Kunnawalkam](#) on Thu, 28 Jun 2012 14:57:49 GMT  
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Hi Stefano

I am kinda confused as to where and how to define my read outs. For example say that i have a barrel tracker that is a cylinder from  $z = -10$  to  $z = +10$ , with radius say 5 to 10 with all having the same units.

Now say that in the real world, my barrel tracker (Batr) has read outs every 1 unit in radius and 5 degree in theta and phi. So i have like a little section with  $r = 5$  to 6, and  $\theta = 0$  to 5 and  $\phi = 0$  to 5 inside which i cannot differentiate between hits.

I am very confused as to which class actually does my digitization. from my reading since yesterday and what you told i see that it is the hit along with hit producer that creates the data that i need.

I think that these are the steps that i need to follow, Please correct me if i am wrong.

1. First i create the following classes for my detector

FairBatr.cxx, FairBatrContFact.cxx, FairBatrGeo.cxx, FairBatrGeoPar.cxx, FairBatrPoint.cxx, FairBatrHit.cxx, FairBatrHitProducer.cxx, FairBatrDigi.cxx, FairBatrDigiProducer.cxx, ( if i want

- to do reco after this then i also add some more classes)
2. create the readouts in FairBatrHit, just like there are mtddigibox and mtddigistrip
  3. Inside FairBatrHitProducer, in the Exec function do the actual digitization.  
this is exactly what i am confused about.
  4. pretty much after part 2 i am confused.

Thanks a lot for all your help

Cheers  
Raghav