Subject: MC Truth with EMC
Posted by StefanoSpataro on Mon, 22 Dec 2014 09:42:06 GMT
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I have committed a modification of the EmcHitProducer, in the part concerning the association to MC truth.
Before the MC index of the hit was associated to the primary tracks creating the secondaries in the crystal (i.e. if you have a photon creating e+ e- inside the crystal the hit is associated only to the primary photon, but if you have a pion decaying into muon + nu on the fly and the muon was hitting the emc, the hit was associated wrongly to the primary pion).
Now the code associates the hit to the first mother particle which was not produced inside EMC (if the particle is not primary). In both the previous cases the MC association should work.

I wait for some feedback.

Subject: Re: MC Truth with EMC
Posted by Lu Cao on Mon, 12 Jan 2015 09:30:58 GMT
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Hello Stefano,

I tried the new version of PndEmcHitProducer.cxx which you sent to me by email, but it made no differences on the PidNeutral/ChargedCand.fMcIndex. Is there anything else I should have a look?

Best regards,
Lu

Subject: Re: MC Truth with EMC
Posted by StefanoSpataro on Mon, 12 Jan 2015 10:22:08 GMT
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No difference compared to what? The class is in the repository since several weeks, are you comparing with an older version? (how much older?) The distributions are exactly the same, or quite similar?
You should check the associated particle from MCTrack and check if it is really what is expected to be.

Subject: Re: MC Truth with EMC
Posted by Lu Cao on Mon, 12 Jan 2015 12:13:13 GMT
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Hi Stefano,
1) PndNeutral(also Charged)Cand.fMcIndex obtained by the new version of PndEmcHitProducer is identical with the one obtained by the old version
2) two versions of code I used are attached for checking
3) exactly the same

4) Before I check the correctness of association, I expect the fMcIndex of PID candidate will be influenced somehow due to your modification, but they didn't, so I don't understand if it 's expected or not.

Best,
Lu

File Attachments
1) new_PndEmcHitProducer.cxx, downloaded 340 times
2) PndEmcHitProducer.cxx, downloaded 331 times

Subject: Re: MC Truth with EMC
Posted by StefanoSpataro on Mon, 12 Jan 2015 12:34:06 GMT
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Are you sure you did recompile properly? Did you run again the sim_complete.C?

Subject: Re: MC Truth with EMC
Posted by Lu Cao on Mon, 12 Jan 2015 13:03:05 GMT
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uh...I double checked it again last week and got the same result. I didn't re-run sim, since I thought it make sense comparing the output with the exactly same events. I did re-run digi,reco,pid.

Subject: Re: MC Truth with EMC
Posted by StefanoSpataro on Mon, 12 Jan 2015 18:07:19 GMT
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The EmcHitProducer runs in the sim_complete.C macro.

Subject: Re: MC Truth with EMC
Posted by Lu Cao on Mon, 12 Jan 2015 18:42:26 GMT
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I didn't know this. I'll check it again with the same random seed.
Thank you.

Lu

Subject: Re: MC Truth with EMC
Posted by StefanoSpataro on Thu, 26 Mar 2015 17:40:03 GMT
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Dear all,
I found last week that the EMC MC truth propagation had a logical problem, and I have (hopefully) fixed it.
Today i run as test pbarp -> pi+ pi- pi0 @ 4 GeV/c, checking the MC matching for the photons.

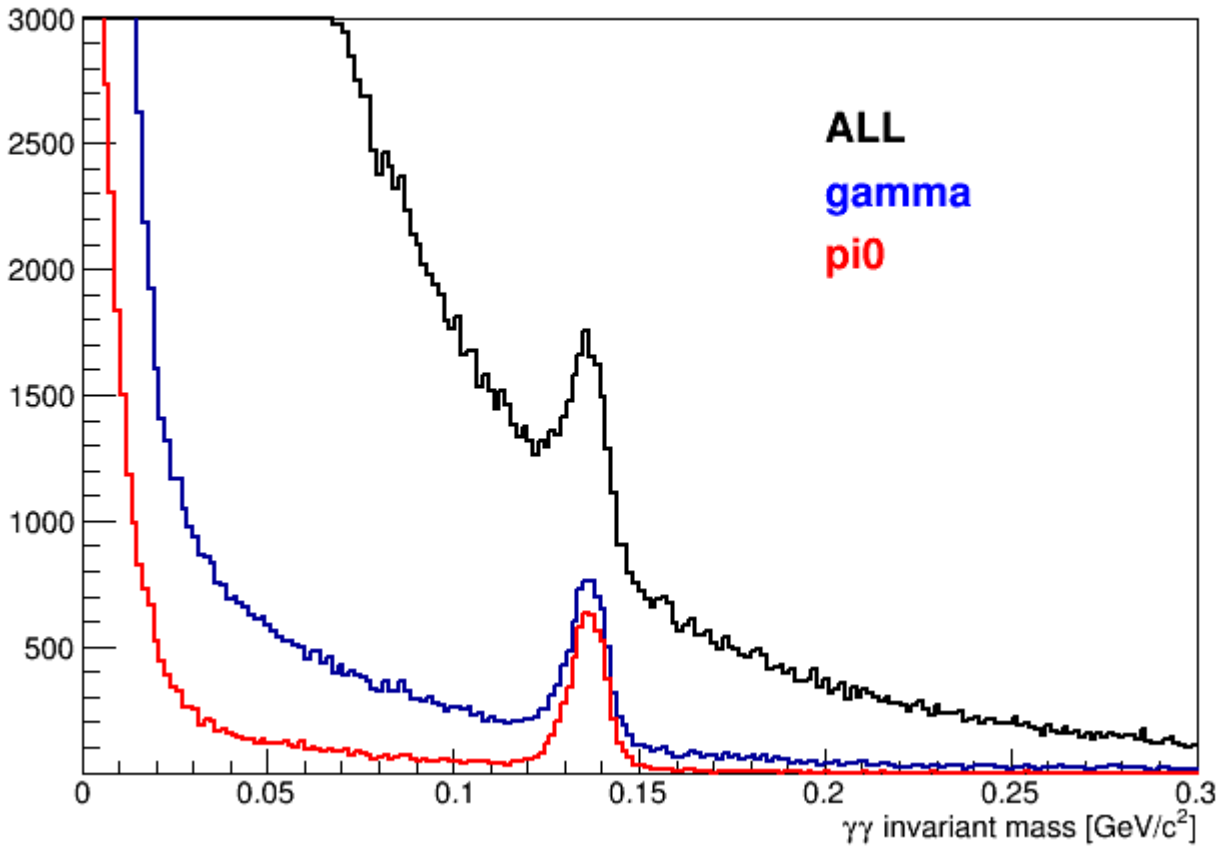
The following plots show, in linear and in log scale, the gamma-gamma invariant mass distribution for all the candidates (black), for the mc matched photons (blue), and for the matched photons coming from pi0.

From the plot I can argue that the MC matching works almost nicely, that the candidates are dominated by particles which are not photons, and that in the pi0 invariant mass there is still a low momentum tail. I could argue that the tail is coming from broken clusters (like between endcaps and barrel, or maybe problems of the clusterization, or maybe splitoffs).

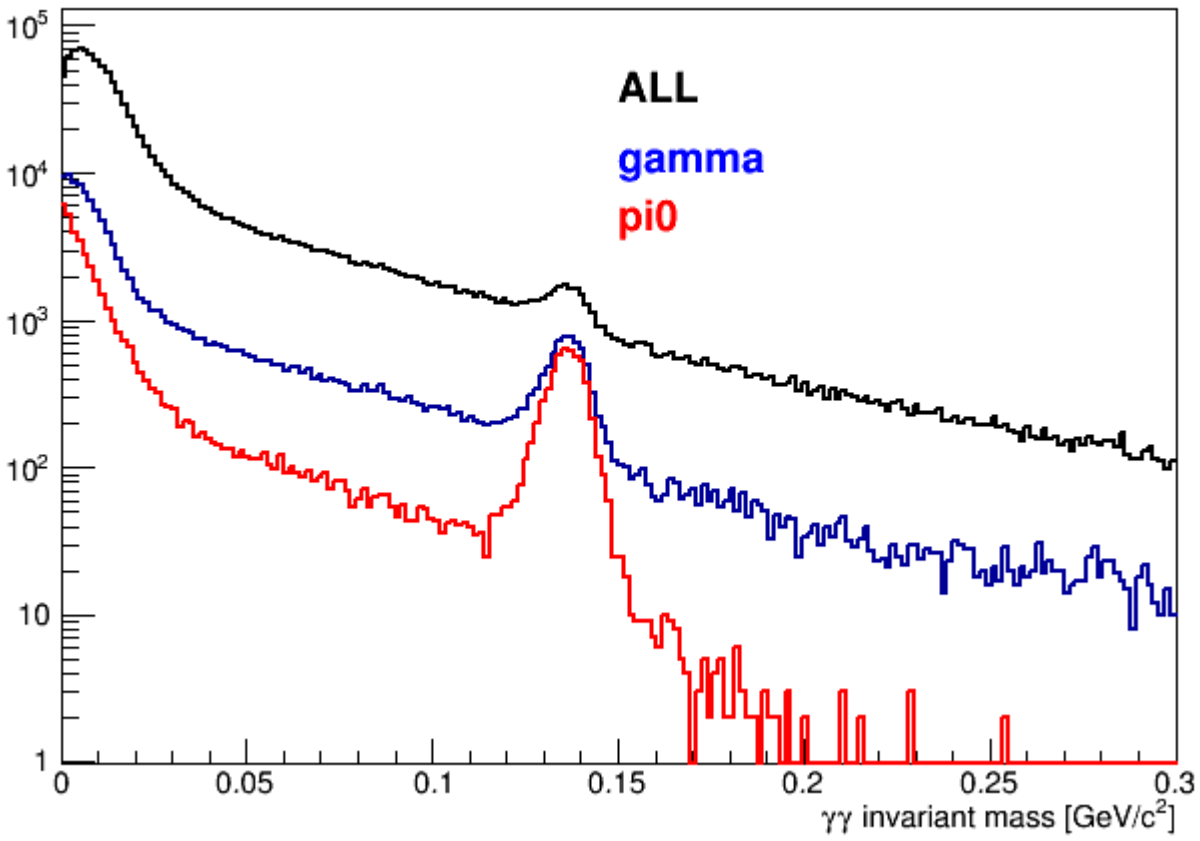
I would be happy if somebody could take a look and try to understand what is going wrong.

File Attachments

1) pi0_lin.gif, downloaded 864 times



2) pi0_log.gif, downloaded 918 times


ALL
gamma
pi0
10^5
10^4
10^3
10^2
10
1
0
0.05
0.1
0.15
0.2
0.25
0.3
γγ invariant mass [GeV/c^2]