Subject: [FIXED] MC matching
Posted by Alexander Zinchenko on Tue, 19 Jan 2016 07:46:43 GMT
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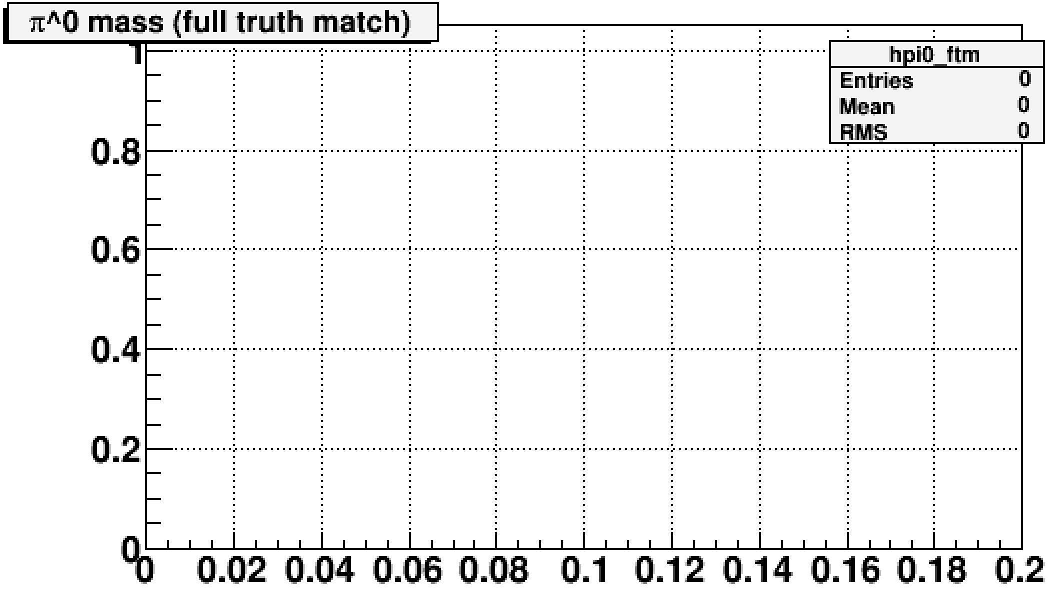
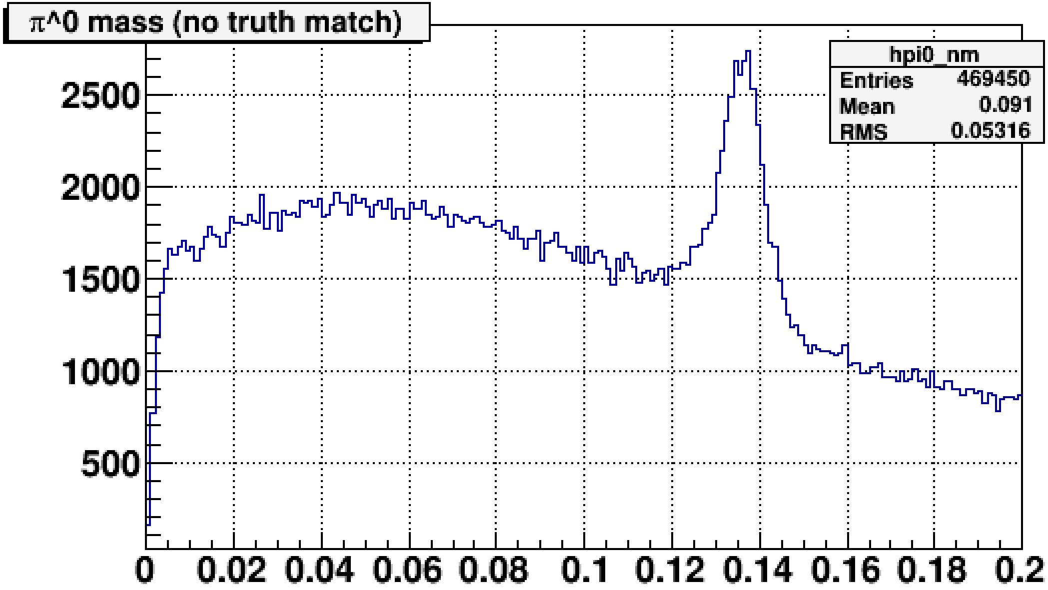
Hello.
I was looking at some decays involving \pi0s. When trying to reconstruct them from 2 photons and check MC truth I get no correct combinations at all - all gamma-gamma go to wrong combination case (see the attached plots).
I am using January 2016 release.

File Attachments

1) ftm.png, downloaded 486 times



2) nm.png, downloaded 520 times



Subject: Re: MC matching
Posted by StefanoSpataro on Tue, 19 Jan 2016 07:59:39 GMT
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Can you attach the analysis macro you wrote?

Subject: Re: MC matching
Posted by Alexander Zinchenko on Tue, 19 Jan 2016 08:04:15 GMT
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It is the same as I used for my previous checks last year - attached.

File Attachments

1) Y4260_jpsi_ana_mumu.C, downloaded 299 times

Subject: Re: MC matching
Posted by Dominik Steinschaden on Wed, 03 Feb 2016 12:47:39 GMT
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Is this problem already solved?

Because some time ago I was not able to use the stored Fairlinks after the digitization stage anymore, due to a bug in the recent Fairroot version as far as I remember.

Maybe this is caused by the same bug.

Dominik

Subject: Re: MC matching
Posted by Tobias Stockmanns on Wed, 03 Feb 2016 13:03:40 GMT
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What macros did you use for the complete simulation/digitization/reconstruction chain?

Cheers,

Tobias

Subject: Re: MC matching
Posted by Alexander Zinchenko on Thu, 04 Feb 2016 07:36:55 GMT
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I used the set of macros from tutorials/rho directory which are run from the script tut_runall.sh except the simulation macro that was slightly modified (attached).
Regards.

Alexander

File Attachments

1) tut_sim.C, downloaded 309 times

Subject: Re: MC matching
Posted by StefanoSpataro on Thu, 04 Feb 2016 09:58:56 GMT
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Hi,
I think tutorial macros are not yet updated to use FairLinks, while the ones in macro/run should be good.
I suggest the following: you need to add the code line:

fRun->SetUseFairLinks(kTRUE);

before

FairRuntimeDb *rtdb=fRun->GetRuntimeDb();

In all the macros sim digi reco and pid. This should solve the problem.

The way to solve the problem of misaligned macros is in the repository since few versions, I will report maybe next SeeVogh.

Subject: Re: MC matching
Posted by Alexander Zinchenko on Fri, 05 Feb 2016 11:04:33 GMT
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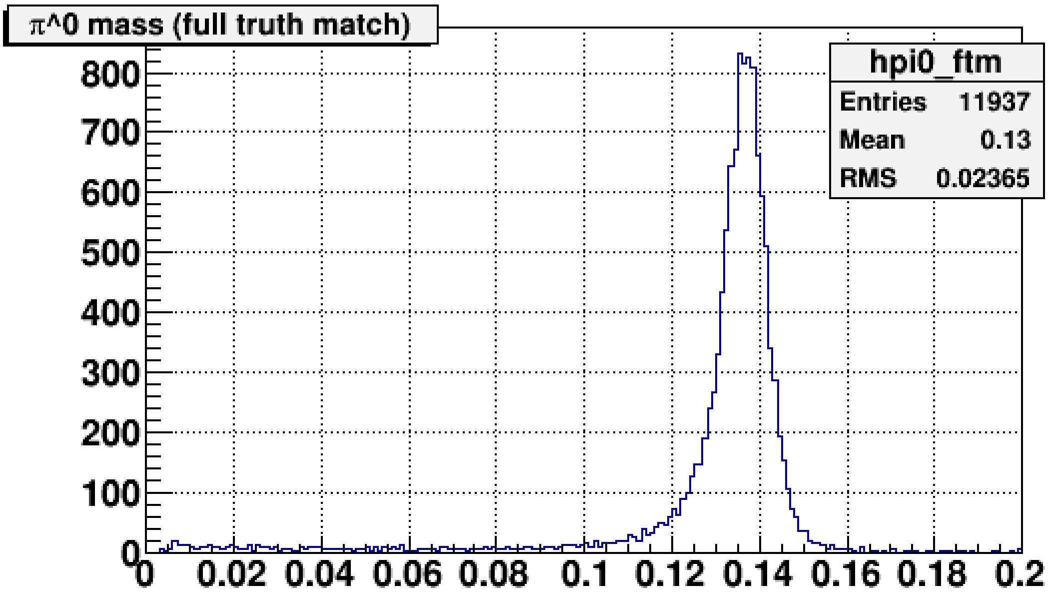
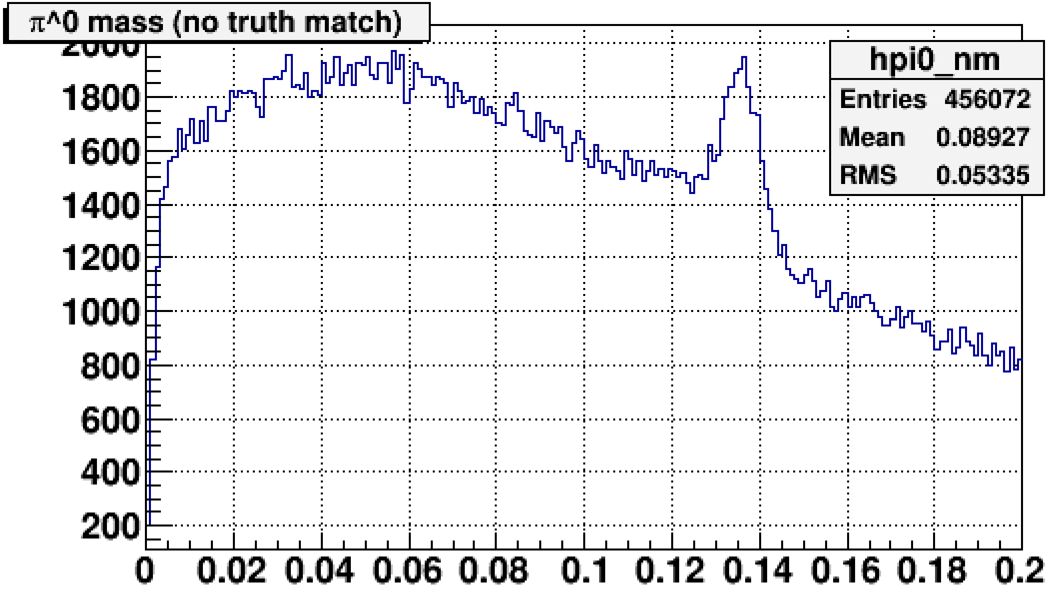
Hi,
the proposed remedy seems to solve the problem, but only partially - see attachments. There are still signal combinations in the "no match" sample.
Any other suggestions?
Alexander

File Attachments

1) ftm.png, downloaded 453 times



2) nm.png, downloaded 456 times



Subject: Re: MC matching
Posted by StefanoSpataro on Fri, 05 Feb 2016 12:37:35 GMT
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I have not well understood, which are the problems of the no-match plot?

Subject: Re: MC matching
Posted by Alexander Zinchenko on Fri, 05 Feb 2016 13:17:16 GMT
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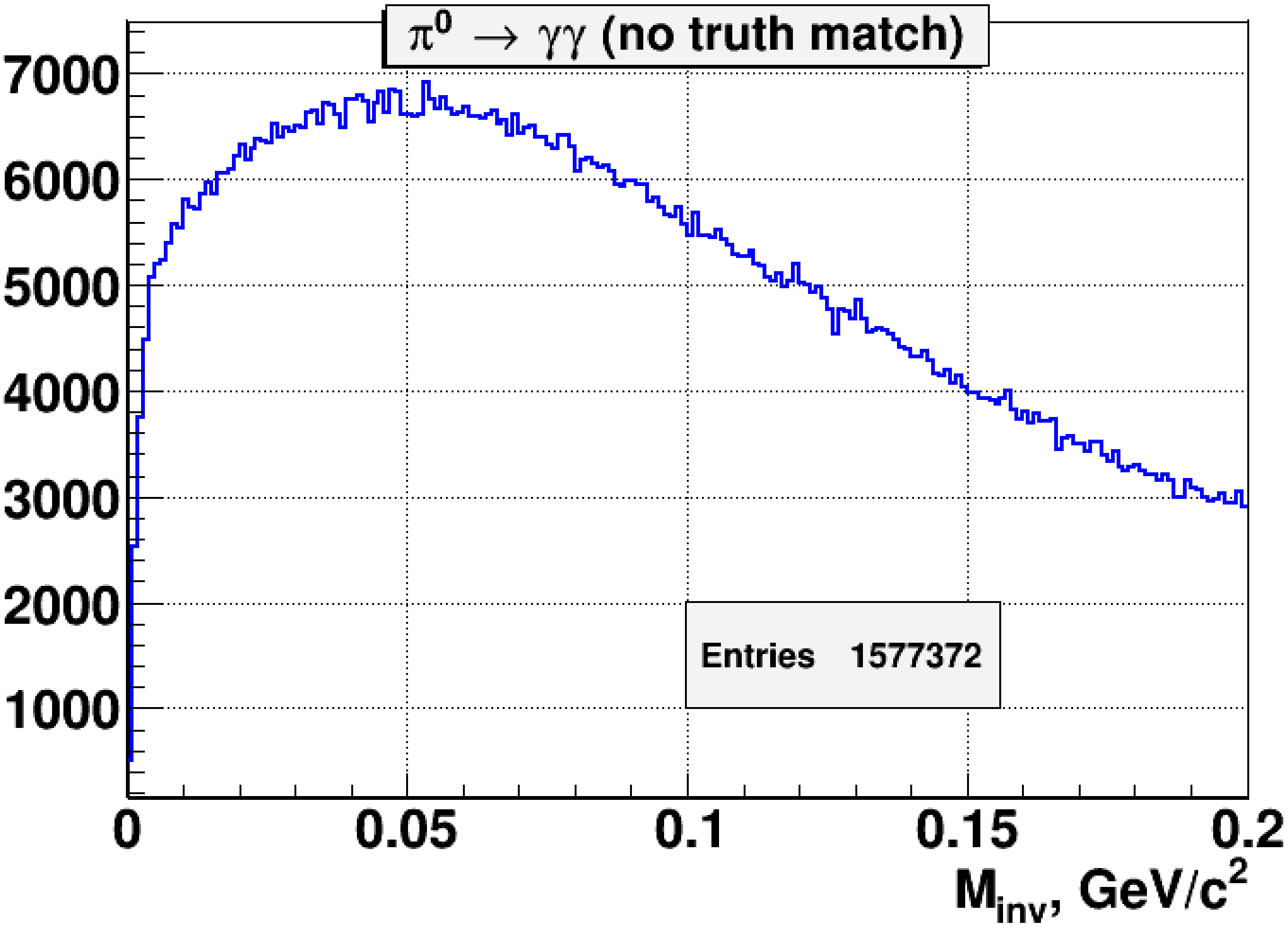
Naively I was expecting it to be looking completely "background-like", i.e. without a peak at

\pi0-mass value.
And, indeed, it was really like that about 1.5 years ago or so (see attachment).

File Attachments

1) pi0_bkg_old.png, downloaded 456 times



Subject: Re: MC matching
Posted by Tobias Stockmanns on Fri, 05 Feb 2016 13:22:26 GMT
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Dear Alexander,

I think the problem is, that you have photon conversion before the calorimeter is hit. In this case the neutral candidate is not treated as the original photon but as the converter electron in the MC matching. You could check this if you ask the particles in your nm plot what the PID of their mother particle is.

Cheers,

Tobias

Subject: Re: MC matching
Posted by Alexander Zinchenko on Wed, 10 Feb 2016 18:37:31 GMT
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Hello.
I tried to do what was suggested (at least as think I did what was suggested), i.e. for pi0-candidates which were classified as "no-matched with MC" I checked PDG codes of both daughters and they are 22 (photons).

Another strange thing (for me - maybe somehow related to this): if I do

```
  PndAnalysis* theAnalysis = new PndAnalysis();

    theAnalysis->FillList(mclist,  "McTruth");

    // Get number of pi0 decaying into gam gam
    for (int jmc = 0; jmc < mclist.GetLength(); ++jmc) {
      if (mclist[jmc]->PdgCode() != 111) continue; // select only pi0
      hpi0_mult->Fill(mclist[jmc]->NDaughters());
    }
```

I get quite a few cases with only one daughter. Is it a normal behavior?

Subject: Re: MC matching
Posted by StefanoSpataro on Wed, 10 Feb 2016 18:52:19 GMT
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If one of the photons is going in a direction without leaving a signal in the detector this can happen, the daugher is not stored in the MCTrack. This is a setting in the g3Config.C:

```
 st->SetMinPoints(1);
```

If you do:

```
 st->SetMinPoints(0);
```

then you will see also the particles w/o leaving hits in the detectors, but your MC data size will be much larger.

Subject: Re: MC matching
Posted by Alexander Zinchenko on Thu, 11 Feb 2016 19:22:50 GMT
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Hello.
I have managed to check the proposed explanation of the origin of the "non-matched" pi0's. They are indeed due to early interactions of decay photons. So, I suppose the case can be closed. Thanks for cooperation.
    Alexander