Subject: eta_c reconstruction efficiency
Posted by Gianluigi Boca on Sat, 19 Nov 2011 22:22:39 GMT
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Hello,
I verified that the loss in efficiency in the Eta_c channel certainly depends HEAVILY on the selection criterion I used in the FINAL association (ie, after the track parameters are found by the STT + Mvd Pattern Recognition) of the Mvd hits to the tracks found by the pattern recognition.

The stricter criterion, used in the July11 version, gives the best efficiency.

I restored this stricter selection to the PndSttMvdTracking.cxx version presently in the trunk.

Therefore now Dima et al. can start reanalysing the data and see what happens.

From my side I'd like to continue to investigate :
1) whether this is the only cause of the drop in efficiency;
2) understanding if it is the Kalman that is very sensitive to the presence of one or two spurious hits or if it is the vertexing algorithm or some thing else.

Cheers ! Gianluigi

Subject: Re: eta_c reconstruction efficiency
Posted by StefanoSpataro on Mon, 21 Nov 2011 09:07:25 GMT
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Which are the selections cutting so strongly the efficiency? Because, as far as I remember, also Elisa and Marius analyses were suffering from this drop, and I suppose they have used different selection criteria. Also I was able to see the drop, with my macro completely different from the Dima's one, and without using cuts (apart from the mc id).

Subject: Re: eta_c reconstruction efficiency
Posted by Dima Melnychuk on Mon, 21 Nov 2011 10:15:08 GMT
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Hi Stefano,

In my understanding the problem was not with selection in analysis but with cut used internally in PndSttMvdTracking.cxx
You can see inside PndSttMvdTracking.cxx now:

const Double_t MvdCut=0.3;

insead of

const Double_t MvdCut=0.8;

So the data should be reproduced at least from the reconstruction level (and I suppose for all

the channels).

Dima

Subject: Re: eta_c reconstruction efficiency
Posted by StefanoSpataro on Mon, 21 Nov 2011 10:30:48 GMT
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Sorry, I had understood that we were speaking about the analysis selection critera.
I will check the new trunk, then.

Subject: Re: eta_c reconstruction efficiency
Posted by StefanoSpataro on Mon, 21 Nov 2011 16:46:06 GMT
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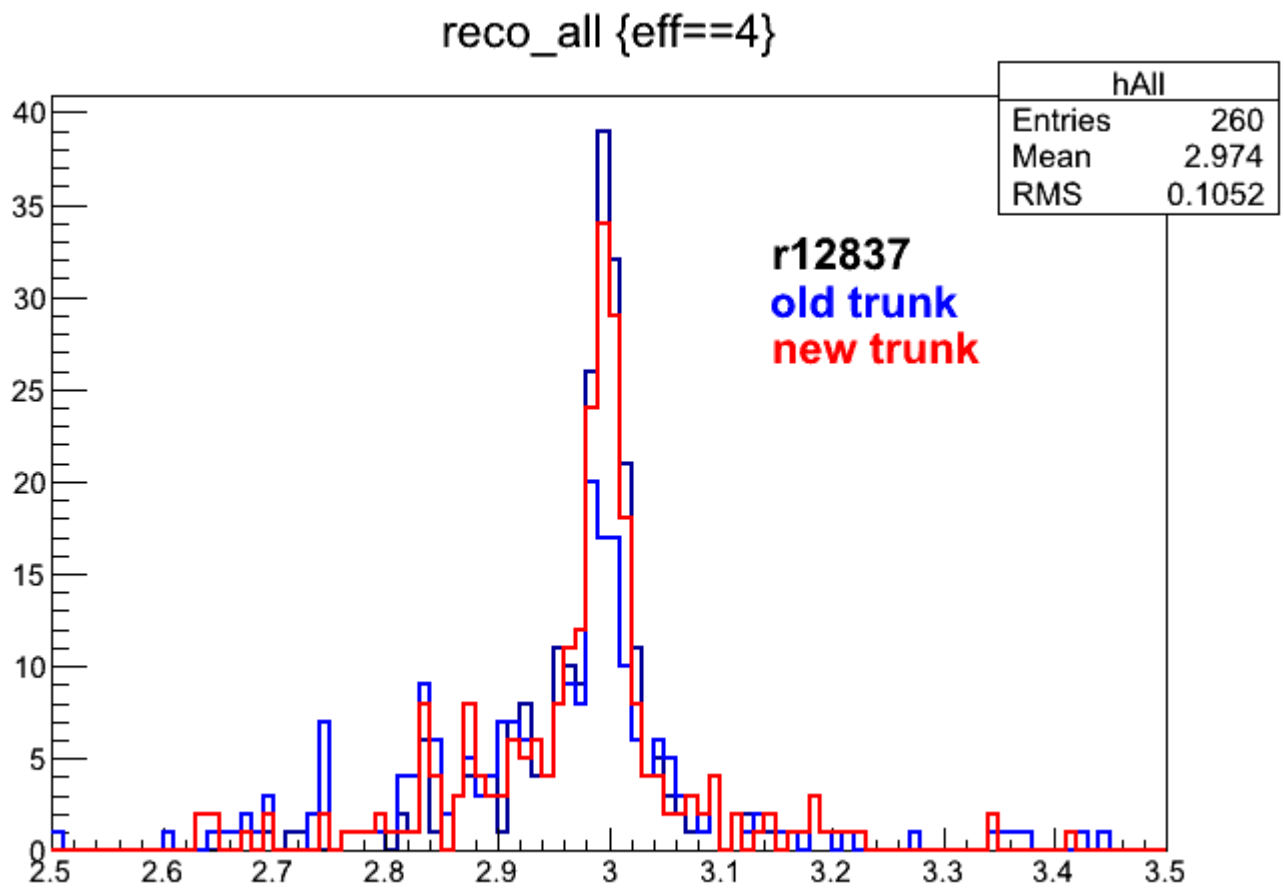
I have tried the new trunk and compared the eta peak with the old trunk and the "good" r12837 revision:

The improvement in the new trunk is quite visible comapred top the old trunk! The peak seems a bit lower than july version, but we are quite close to the good value!

File Attachments
1) newcomp.gif, downloaded 837 times



Subject: Re: eta_c reconstruction efficiency
Posted by StefanoSpataro on Tue, 22 Nov 2011 13:52:08 GMT
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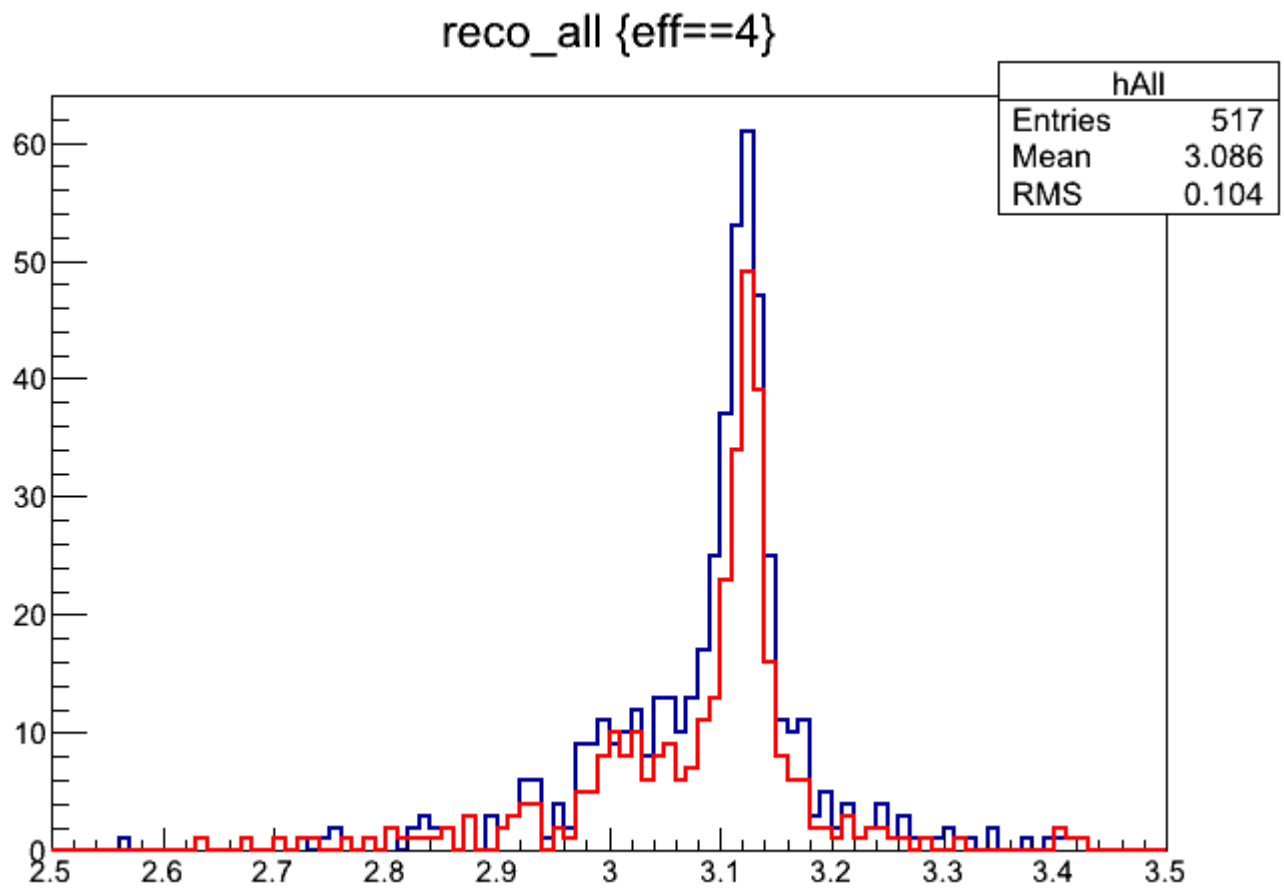
I have also run 1000 eta_c events, and compared the results of the new trunk with (red) and without (blue) cleanup.

Maybe it is time to check higher statistics on the grid.

File Attachments

1) eta_cleanup.gif, downloaded 841 times



Subject: Re: eta_c reconstruction efficiency
Posted by Gianluigi Boca on Wed, 23 Nov 2011 16:59:14 GMT
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Stefano Spataro wrote on Tue, 22 November 2011 14:52I have also run 1000 eta_c events, and compared the results of the new trunk with (red) and without (blue) cleanup.

Maybe it is time to check higher statistics on the grid.

Hi,
yes, I know, there is still a small inefficiency (7%) in the TRUNK relative to the July11 version .

This again is due to some extra spurious hits, this time in the STT
system.
Again it is most likely due to some more relaxed criterion in the Pattern Recognition, in the association of the of the STT hits to a found track.

Therefore I am fixing this for the time being by restoring the older stricter criterion.

The next step will be to investigate where exactly these few extra spurious hits have this

negative impact (Kalman filter? Vertexing routines ? Analysis selection criteria ?).

My feeling today is that when we have an operating Deterministic Annihiling Kalman filter (which is already in place, but not the default) these cases could be overcome.

Gianluigi
