
Subject: Small positive chi2 values in PndKinFitter
Posted by [Lu Cao](#) on Tue, 30 Apr 2013 09:13:35 GMT
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Dear all,

In the simulation (#18621) of $p\bar{p} \rightarrow D_s^+ D_s^-$; $D_s^- \rightarrow K^+ K^- \pi^-$; $D_s^+ \rightarrow \eta e^+ \nu_e$; $\eta \rightarrow \pi^+ \pi^- \pi^0$, I did the mass constraint fitting to the π^0 candidates with PndKinFitter. All the chi2s are pretty small with the mean value of ~ 0.001 . This also happens in the case of η .

I noticed the previous topic discussed by Albrecht about the negative and extremely small chi2 in PndKinVtxFitter.

<https://forum.gsi.de/index.php?t=tree&th=3385&start=0&rid=1979&S=7cee6febef5676d17dc9e3154e1269e2>

Considering the formula for chi2, the small values may be due to a large sigma in the denominator.

Does anybody have some solutions or hints to improve it?
or is there any way else to understand this problem?

Thanks in advance.

Subject: Re: Small positive chi2 values in PndKinFitter
Posted by [Stefano Spataro](#) on Tue, 30 Apr 2013 12:13:33 GMT
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Hi,
we have seen the same problem analysing the $D^{*+}D^{*-}$ channel, chi2 too small from the fitter.

Subject: Re: Small positive chi2 values in PndKinFitter
Posted by [Klaus Götzen](#) on Tue, 30 Apr 2013 15:41:29 GMT
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Hi,

I don't know the reason for the problem, I just can imagine, that the covariance matrix for the neutrals/gammas might be incorrect. I actually don't know how to check.

Would be a question for the EMC experts...

Best regards,
Klaus

Subject: Re: Small positive chi2 values in PndKinFitter

Posted by [Stefano Spataro](#) on Tue, 30 Apr 2013 16:44:21 GMT

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In our case, the used fitter was the 4C and the channel was completely charged (2 kaons + 4 pions).

I believe it is a problem of tracking errors.

Subject: Re: Small positive chi2 values in PndKinFitter

Posted by [Klaus Götzen](#) on Tue, 30 Apr 2013 18:33:26 GMT

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Ralf actually is/was taking a close look to the fitters. Maybe that helps to solve the problem soon...

Subject: Re: Small positive chi2 values in PndKinFitter

Posted by [Lu Cao](#) on Mon, 27 May 2013 11:14:04 GMT

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Hi,

In the simulation of $D_s^- \rightarrow K^+ K^- \pi^-$, I found the chi2 values are too small in the mass constraint fitting of D_s meson, as that in the D_s^+ (η, e^+, ν_e) case I mentioned before. And it seems impossible to filter out the background completely with chi2 cutting to get a delta function shaped histo for the D_s mass.

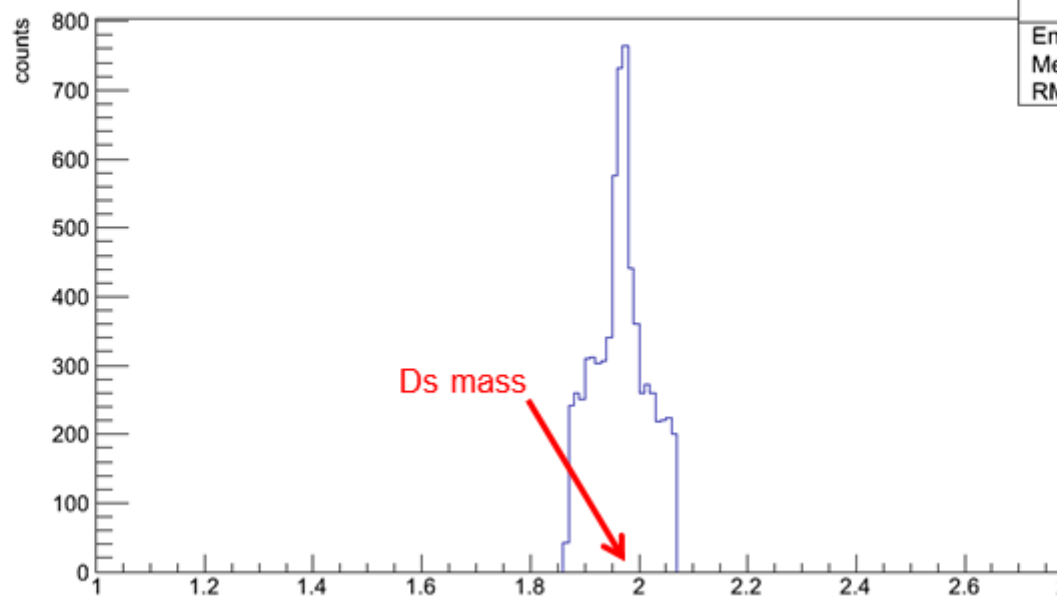
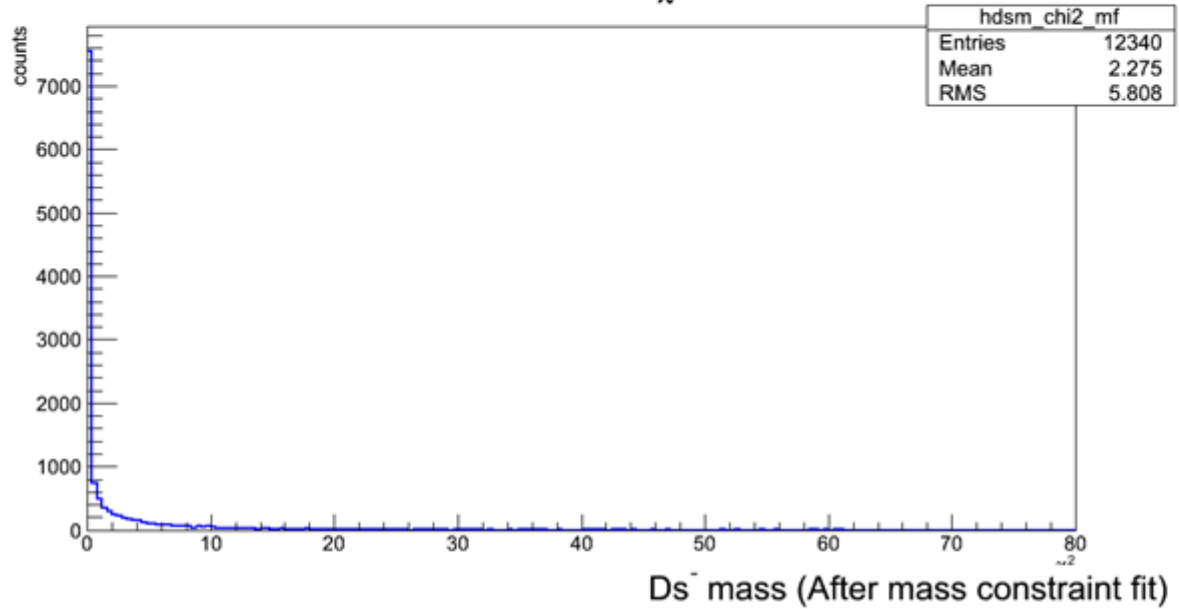
If the problem related the fitter can not be solved at this moment, how can I improve the selection in the present situation?

File Attachments

1) [Ds_mcf.png](#), downloaded 924 times

Reconstruction: $D_s^- \rightarrow K^+ K^- \pi^-$

Mass constraint fit χ^2 of D_s^-



2013/5/27