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 pbar p -> Ds+ Ds-; Ds- -> K+ K- pi-; Ds+ ->eta e+ nue; eta -> pi+ pi- pi0, I did the mass constraint fitting to the pi0 candidates with PndKinFitter. All the chi2s are pretty small with the mean value of ~0.001. This also happens in the case of eta.

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=19 79&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 StefanoSpataro on Tue, 30 Apr 2013 12:13:33 GMT
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Hi,
we have seens 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 StefanoSpataro 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 Ds- -> K+ K- pi-, I found the chi2 values are too small in the mass constraint fitting of Ds meson, as that in the Ds+ (eta,e+,nu_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 Ds mass.

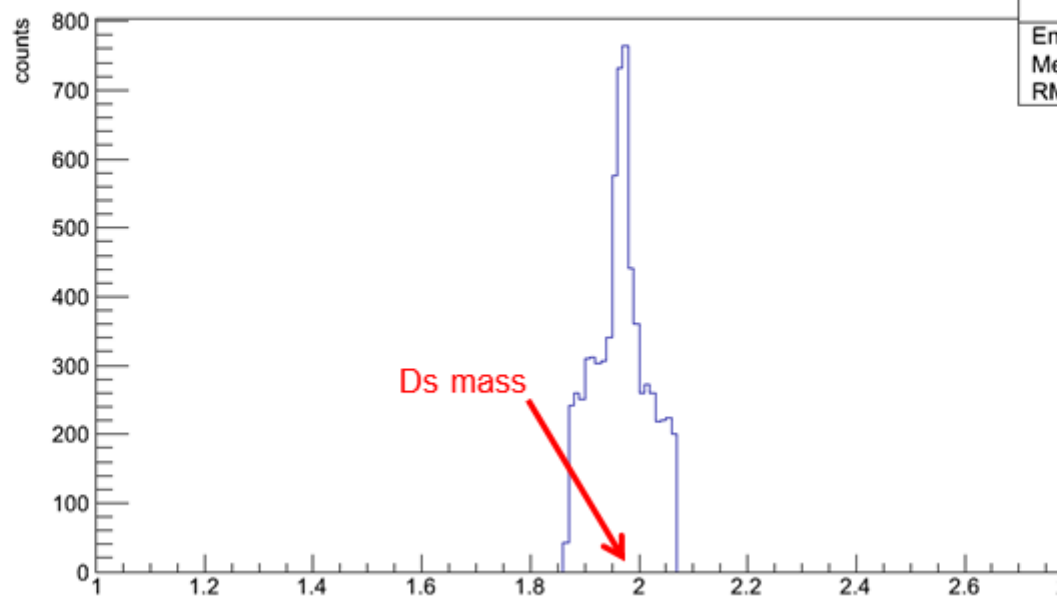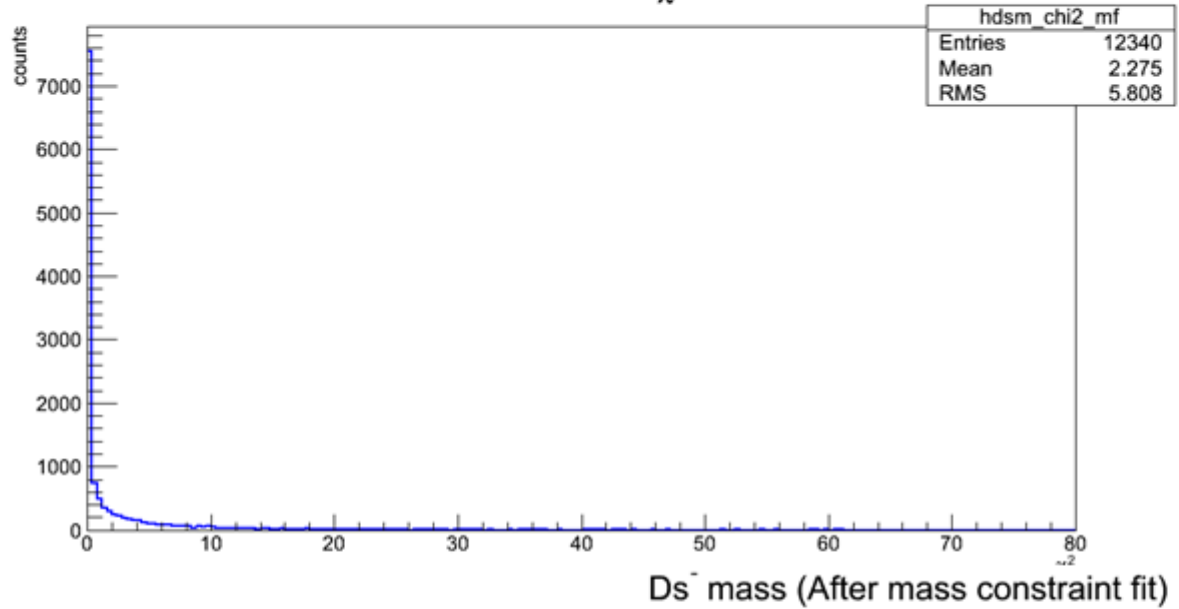If the problem related the fitter can not be solved at this moment, how can I improve the selection in the present situation?

File Attachments
1) Ds_mcf.png, downloaded 577 times

Reconstruction: Ds- -> K+ K- pi-

ev

Mass

const

Mass constraint fit χ^2 of Ds⁻

hdsm_chi2_mf	
Entries	12340
Mean	2.275
RMS	5.808

Ds⁻ mass (After mass constraint fit)

Ds mass

2013/5/27