Subject: negative chi2 in PndKinVtxFitter !
Posted by Albrecht Gillitzer on Wed, 26 Oct 2011 08:21:16 GMT
View Forum Message <> Reply to Message

Hi

In the simulation (rev 13401) of pbar p --> Ds+ Ds-; Ds+ --> phi pi+, Ds- --> phi e- nuebar I found in some cases negative(!) chi2 values in the phi-->K+K- vertex fit, using PndKinVtxFitter. The occurrence is on the level of ~1% with respect to the number of all K+K- combinations, or even more than 5% with respect to the number of analyzed events. Sometimes extremely small positive chi2 values << 1 (e.g. 10**-5 or 10**-5) are seen which is also strange.

It also occurs if I fit the Ds+ and Ds- vertices with three charged tracks.

I then checked the macro for the CT TDR benchmark channel Ds+ Ds- in macro/run/tdrct/psi3770: it also occurs there. (I am now running the eta_c macro in macro/run/tdrct/eta_c, but I have no doubt it will also occur there.)

Usually people plot chi2 distributions only for positive values, so that this problem may have escaped our attention.

My question(s): has anybody else taken notice of this problem so far? Is someone willing to look into the PndKinVtxFitter code to find out where things go wrong? How much confidence can we have in a vertex fitter doing such things?

Albrecht

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Marius Mertens on Wed, 26 Oct 2011 11:00:48 GMT
View Forum Message <> Reply to Message

Hi Albrecht,

I can confirm negative chi2 values from the PndKinVtxFitter as you observed them also for PandaRoot revision 12725.

Marius

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Ralf Kliemt on Mon, 31 Oct 2011 08:15:23 GMT
View Forum Message <> Reply to Message

Hello Albrecht,

Thanks for finding that. I want to make two remarks. First, the PndKinVtxfitter is not the "final product" as everybody wants it to be. As discussed with Jim, the developer will hopefully be invited for a period to finalize it. Second, the fitter is using always a list of true reconstruction tracks, not intermediate composite particles. Hence it tries to fit your K+K-pi+ to one vertex.

Greetings.
Ralf

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Marius Mertens on Mon, 14 Nov 2011 15:16:02 GMT
View Forum Message <> Reply to Message

Hi Ralf,

do you happen to know if there is any fitter which is able to work with composite particles?

Marius

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Ralf Kliemt on Mon, 14 Nov 2011 15:38:11 GMT
View Forum Message <> Reply to Message

Hi Marius,

Until now, I fear you have to artificially create a FairTrackPar for composite TCandidate's. Then the fitter will process it as a real measured track.
I think we might want to discuss how to handle such things on the Collaboration meeting. I think the handling is a bit messy because of the leftovers from Beta/Rho which are not used by Panda.

Kind regards.
Ralf

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Marius Mertens on Mon, 14 Nov 2011 18:11:06 GMT
View Forum Message <> Reply to Message

Hi Ralf,

thanks for the hint about manually creating the Track. However, it's not quite clear to me how this can then be converted to a TCandidate, or any other structure I can pass to the fitters. Is there any documentation on how to do that or something which can help to figure out the data flow?

Marius

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Ralf Kliemt on Mon, 14 Nov 2011 21:54:31 GMT

View Forum Message <> Reply to Message

Hi Marius.

Skippong sercasm, I can only offer you to look it up in the next days.

Ralf

Subject: Re: negative chi2 in PndKinVtxFitter !
Posted by Marius Mertens on Mon, 14 Nov 2011 23:05:37 GMT
View Forum Message <> Reply to Message

Hi Ralf,

Well, there was some nonzero chance for a tutorial or similarly helpful stuff to have escaped my attention. But I do get your point regarding documentation. I must admit that I got pretty lost when I tried to figure out how to transfer the information from object to object which convinces the fitter that the TCandidate it sees is a real (well, fake in this case) track which it can fit.

Thanks a lot!

Marius