Subject: negative chi2 in PndKinVtxFitter !
Posted by Albrecht Gillitzer on Wed, 26 Oct 2011 08:21:16 GMT
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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