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Subject: Vertex fitters' problems

Posted by [Stefano Spataro](#) on Thu, 06 Jun 2013 10:40:24 GMT

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Dear all,

Laura and me are checking the features of our vertex fitters, with the trunk version 20077. In the latest trunk the function GetMcTruth() returns null pointer, than the trunk cannot be used.

We have simulated  $10k \text{ ppbar} \rightarrow D^* + D^{*-} \rightarrow D0\pi + D0\bar{\pi} \rightarrow k\pi + \pi + k + \pi\pi$ , we have used MC truth index to identify the kaon- and the pion+ of the D0 (we have not touched the d0bar). We have uploaded all the relevant macros, you have only to modify the path of the DEC file in the sim macro.

We run PndKinVtxFitter, PndVtxPoca and PndVtxPRG and compared the results. We were able to find a tutorial only for PndKinVtxFitter. The tutorial for PndVtxPoca and PndVtxPRG is missing then we hope we are using them in the proper way.

Please check the code.

Vertex residuals reco - mc (in cm) and chi2 for PndKinVtxFitter:

Vertex residuals reco - mc (in cm) and chi2 for PndVtxPoca:

Vertex residuals reco - mc (in cm) and chi2 for PndVtxPRG:

These are the obtained resolution values:

	X res	Y res	Z res	
PndKinVtxFitter	2um	2um	wrong and asymmetric	
PndVtxPoca	400um	400um	400um	
PndVtxPRG	60um	60um	100um	

Then...

PndKinVtxFitter is obtaining very very very narrow distributions on X and Y. How is it possible? Z distribution is screwed. Chi2 is very low.

PndVtxPoca has too large resolution values, does not work. Decent chi2 maybe.

PndVtxPRG has more reasonable values, even if I believe they are a bit large. It is much slower than the others, most probably because of the 10 iterations, but w/o a tutorial we were not sure about which number to use. Chi2 too low.

Still not checked composite particles (i.e. D\*)

Then...

What to use? Could you please take a look?

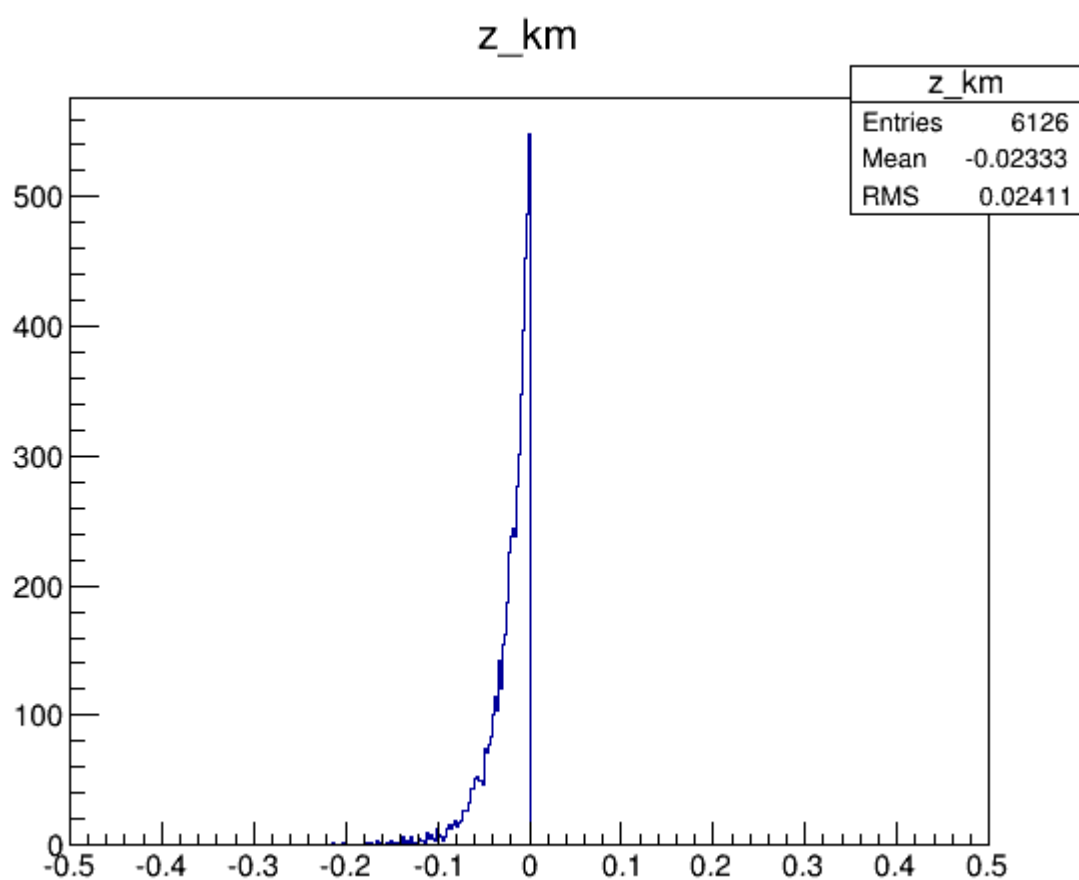
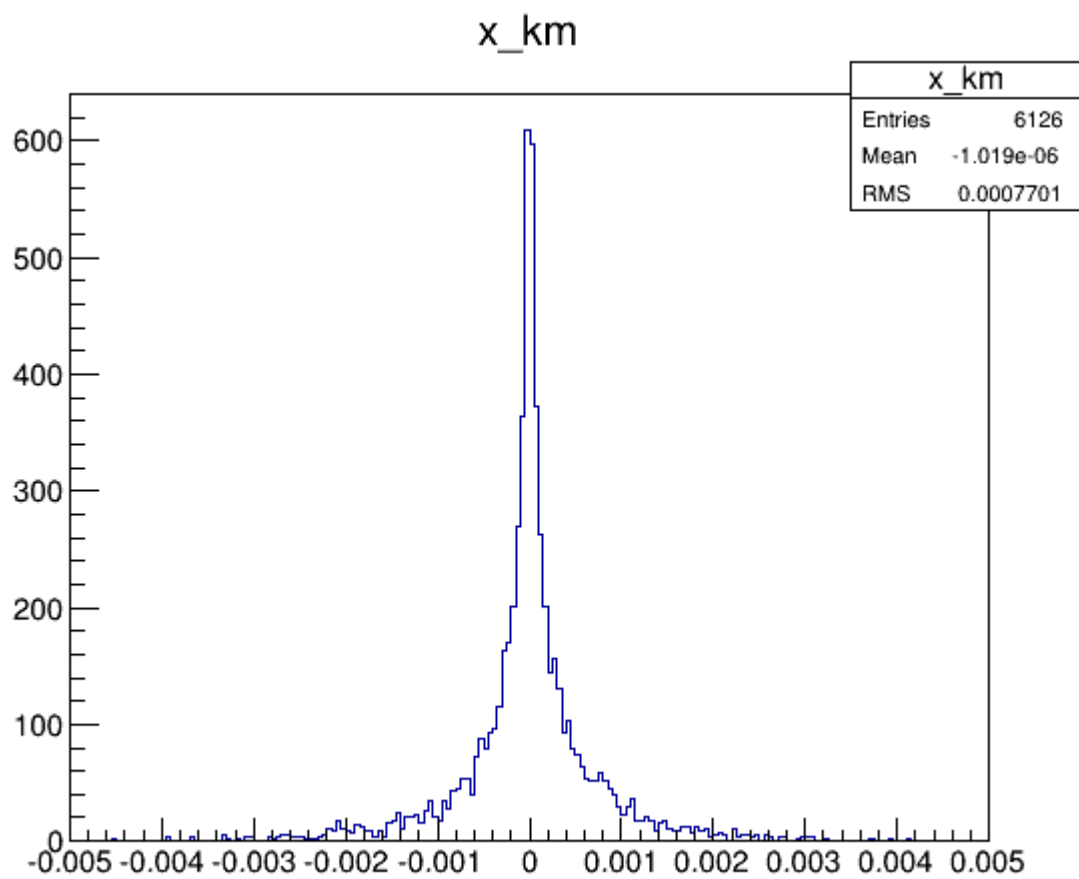
Many tanks in advance.

Laura and Stefano

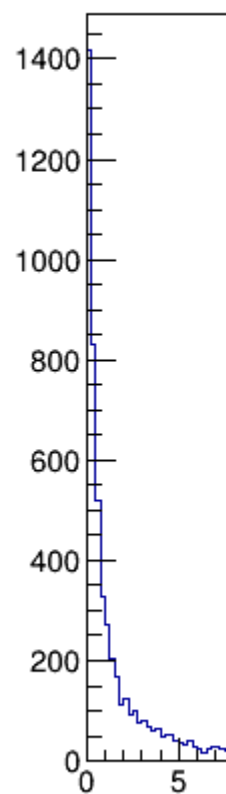
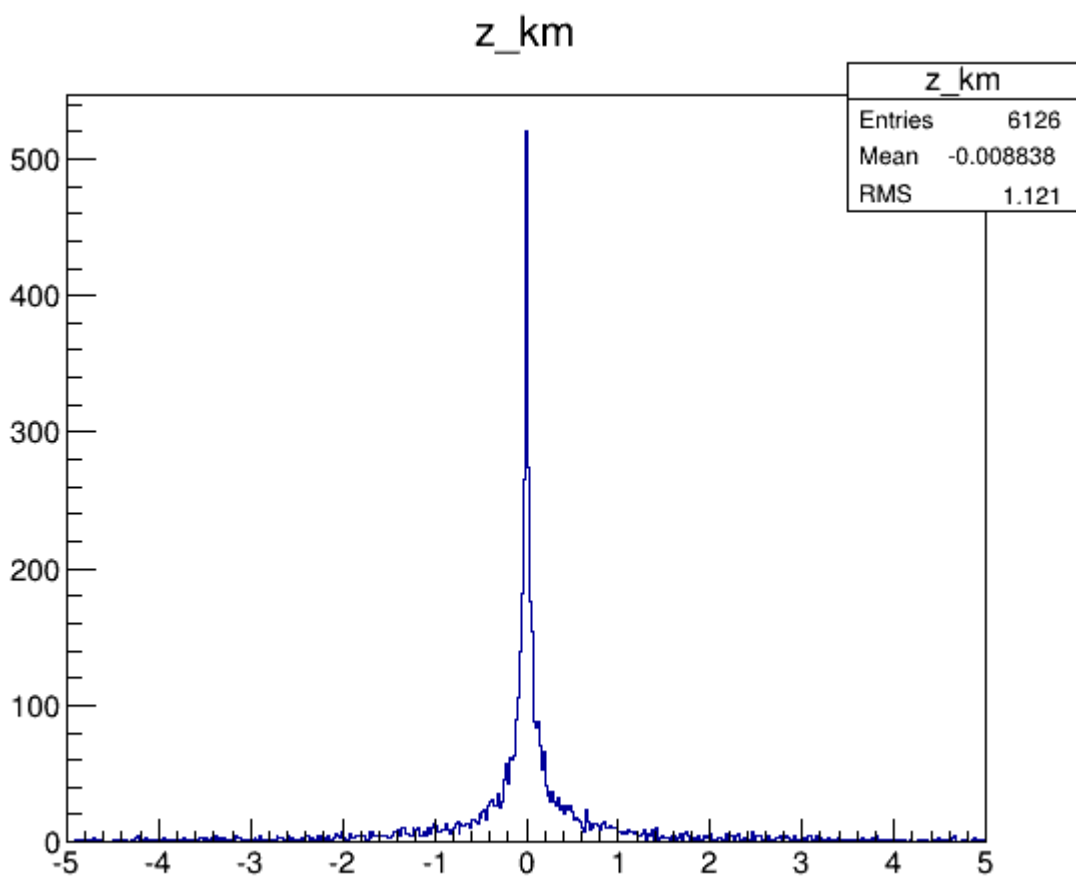
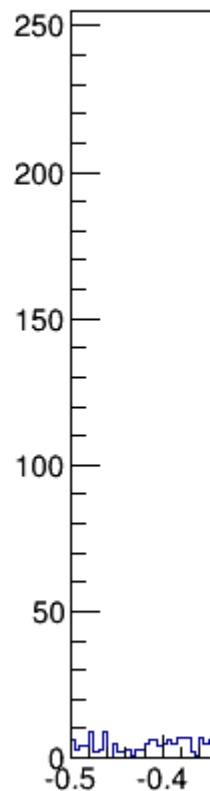
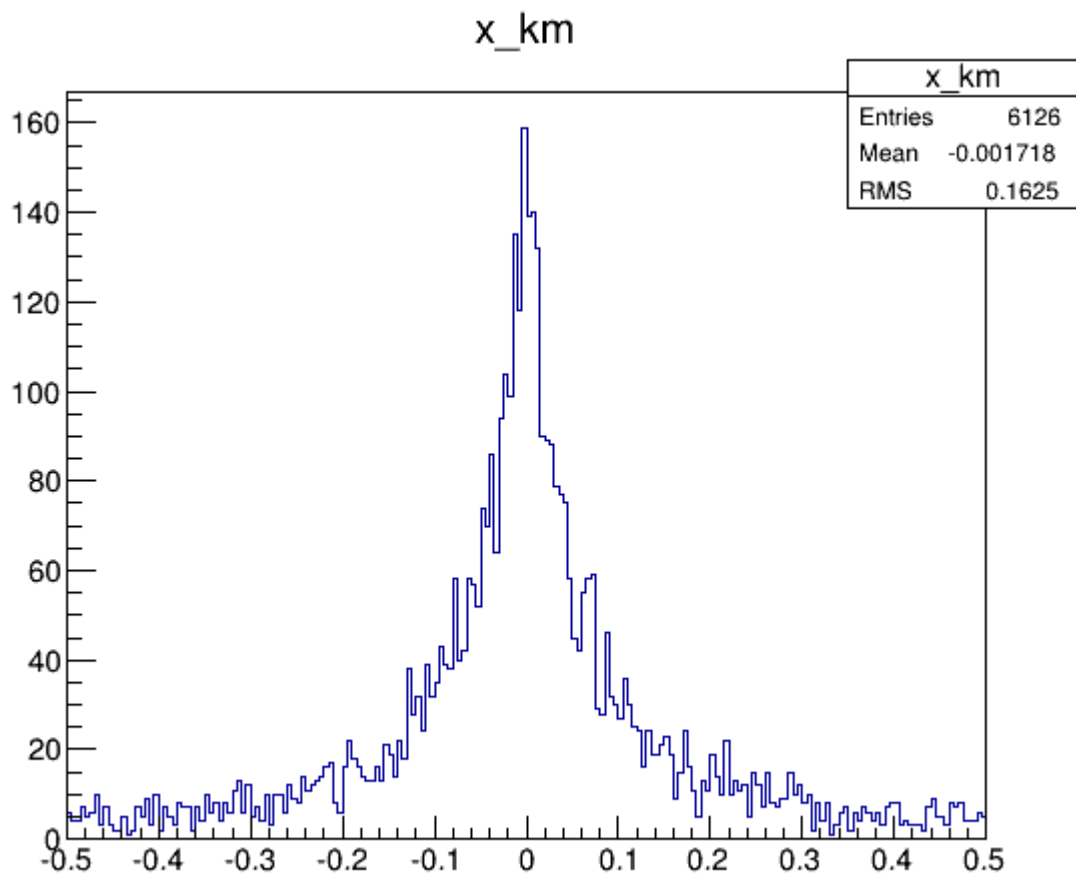
### File Attachments

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- 1) [PSI4040.DEC](#), downloaded 391 times
- 2) [sim\\_complete.C](#), downloaded 382 times
- 3) [digi\\_complete.C](#), downloaded 358 times
- 4) [reco\\_complete.C](#), downloaded 387 times
- 5) [pid\\_complete.C](#), downloaded 356 times
- 6) [match\\_kinvtx.C](#), downloaded 353 times
- 7) [vtx\\_kinvtx.gif](#), downloaded 1045 times



8) [vtx\\_poca.gif](#), downloaded 1116 times



9) [vtx\\_prg.gif](#), downloaded 1102 times

