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Subject: [FIXED] Problem with mass constraint fit for two gamma

Posted by [donghee](#) on Mon, 30 Jun 2014 08:56:57 GMT

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Hi

I found a strange behaviour with mass constrain fit.

For charged combination (here is e.g.  $D0 \rightarrow K\pi^+$ ), chi2 distribution of mass constrain fit are similar and seems to be OK for both full and fast simulation.

An issue about mass constraint fit has been fixed in few weeks ago. (see message #16518 : Problems with PndKinFitter::AddMassConstraint).

However one more problem is still remaining.

For neutral combination (here is e.g.  $D0 \rightarrow \gamma\gamma$ ), chi2 distribution and also probability distribution of mass constrain fit are too different in the case of full and fast simulation at scrut14. I have correctly delta function for invariant mass for gamma gamma combination after mass constraint fit.

Only problem is the two low chi2 distribution(distributed in below 0.1) in the full simulation.

full\_gg\_mass\_fit\_results\_to\_forum\_charged.eps show the chi2 distribution of the mass fit for  $D0 \rightarrow K\pi^+$  in two cases(fast and full).

full\_gg\_mass\_fit\_results\_to\_forum\_neutral.eps show the chi2 distribution of the mass fit for  $D0 \rightarrow \gamma\gamma$ .

Below is the accessor what I have commonly used for full and fast with scrut14 version.

```
//Pnd Kin Mass Fitter
PndKinFitter mfitter(dp[j]); // instantiate the kin fitter in
mfitter.AddMassConstraint(D0Mass); // set 4 constraint
mfitter.Fit(); // do fit
double chi2_m = mfitter.GetChi2(); // get chi2 of fit
double prob_m = mfitter.GetProb(); // access probability of fit
RhoCandidate *dpfit_mass = dp[j]->GetFit(); // get fitted D0
```

I don't understand why the chi2 distributions are so different for the neutral combination in both case(full and fast)?

I assume that some factors are missing or NDF is handled wrongly for the neutral combination case in the full simulation .

Best wishes,  
Donghee

## File Attachments

1) [full\\_gg\\_mass\\_fit\\_results\\_to\\_forum\\_charged.eps](#), downloaded 372 times

2) [full\\_gg\\_mass\\_fit\\_results\\_to\\_forum\\_neutral.eps](#), downloaded

335 times

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