Subject: Checking psi(2s) with genfit2
Posted by StefanoSpataro on Tue, 15 Mar 2016 15:33:12 GMT
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Dear all,
I decided to test genfit2 performances with the psi(2S) sample macros we are using form our analysis qa, i.e. psi(2s) -> J/psi pi+pi- and J/psi->mu+ mu-
I am comparing results with genfit1 (1 iteration) with genfit2 (1 iteration) and genfit2 (3 iterations).

I have taken the macros in macro/qa/run3 and modified the reco_complete and the pid_complete, in the following way:

reco_complete.C
Genfit1: untouched
Genfit2: PndRecoKalmanTask2 instead of PndRecoKalmanTask for both TS and FS kalman tasks. Removed the lines SetTrackRep(0);
Genfit2 3 iter: as Genfit2, but adding the lines ->SetNumIterations(3) for both TS and FS kalman tasks

pid_complete.C
In the three cases, in order to remove the "non fitted tracks" selection (which does not work in genfit2 up to now), added corr->SetFlagCut(kFALSE);

Here the comparison genfit1 (1 iter) vs genfit2 (1 iter):

genfit2 (1 iter) vs genfit2 (3 iter)

genfit2 (3 iter) vs genfit1 (1 iter)

For 1 iteration genfit, it seems that genfit2 has more counts than genfit1 in the low p range (below 0.3 GeV/c), but checking the full truth match invariant mass distributions, J/psi is narrower with genfit1 while psi(2s) is more or less the same.

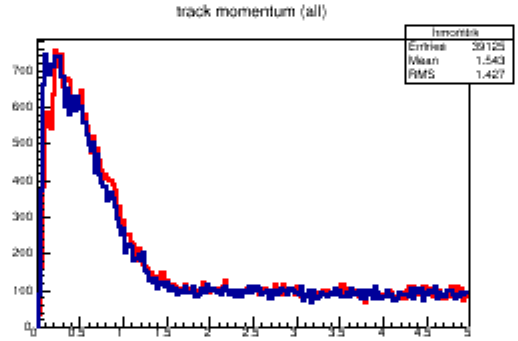
Comparing genfit2 with 1 and 3 iterations, we can see that the gain in low p vanishes, maybe they were just fakes and with 3 iterations such tracks are ruled out. The J/psi and psi(2s) invariant mass are almost equivalent.

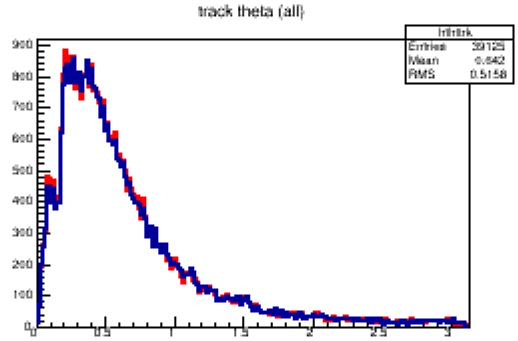
Comparing genfit2 3 iterations against genfit1, even in this case genfit1 seems to win but just for a bit.

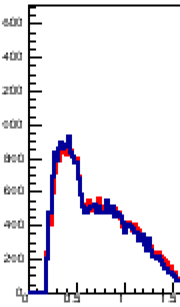
Are these results coherent to what presented before?

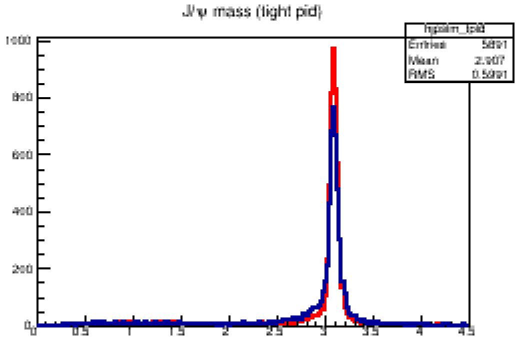
File Attachments

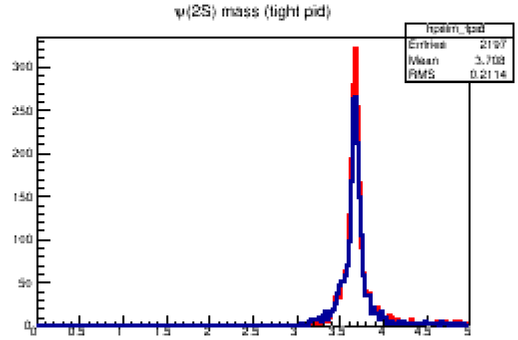
1) comp_gf2_gf.gif, downloaded 1155 times

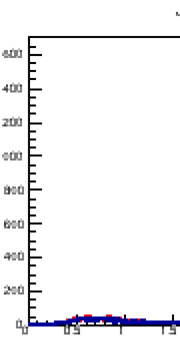

track momentum (all)

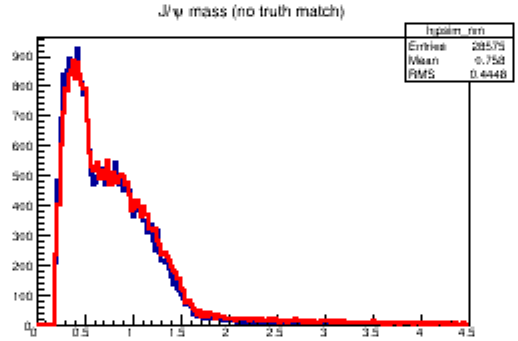

track theta (all)

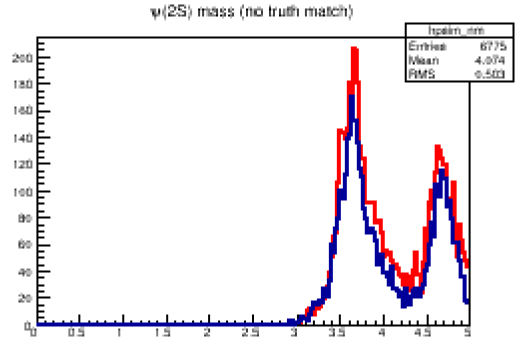


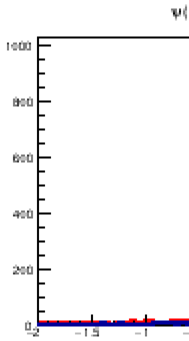

J/ψ mass (tight pid)

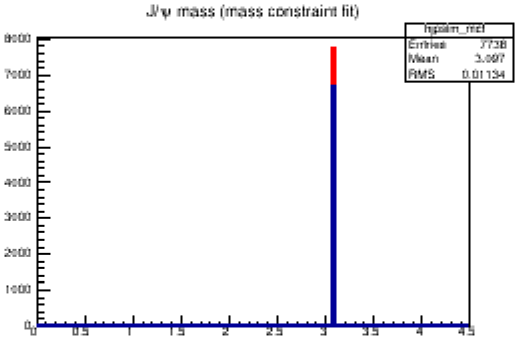

ψ(2S) mass (tight pid)

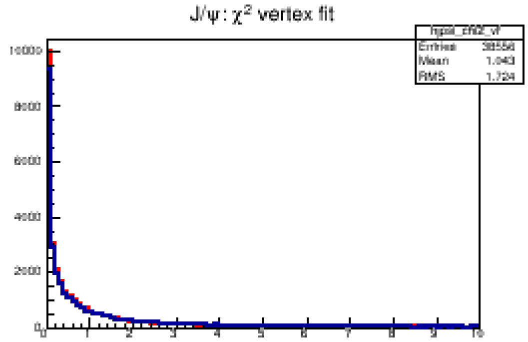


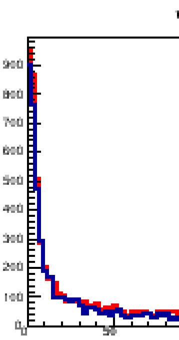

J/ψ mass (no truth match)

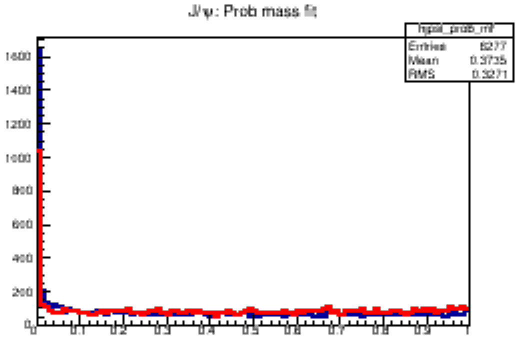

ψ(2S) mass (no truth match)



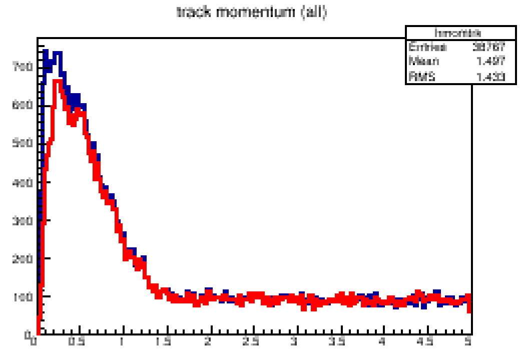

J/ψ mass (mass constraint fit)

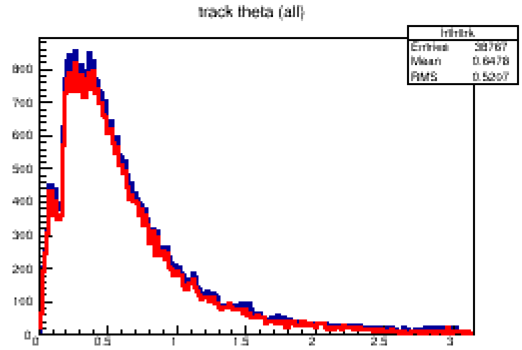

J/ψ : χ^2 vertex fit

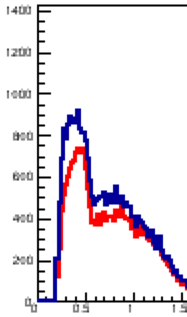


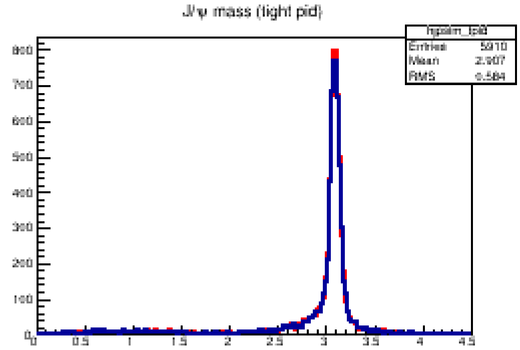

J/ψ: Prob mass fit

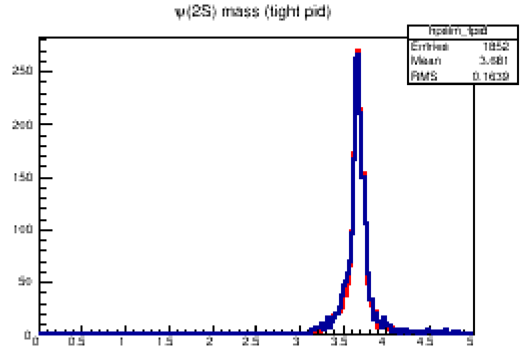
2) comp_gf2_gf23.gif, downloaded 1218 times

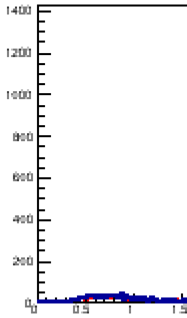

track momentum (all)

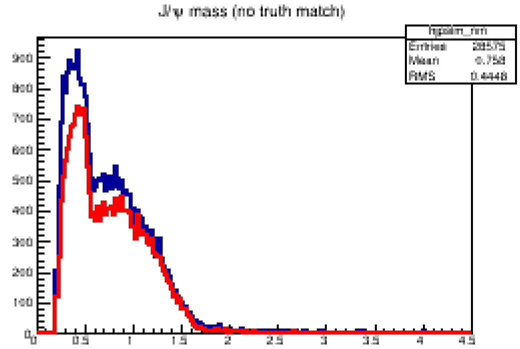

track theta (all)

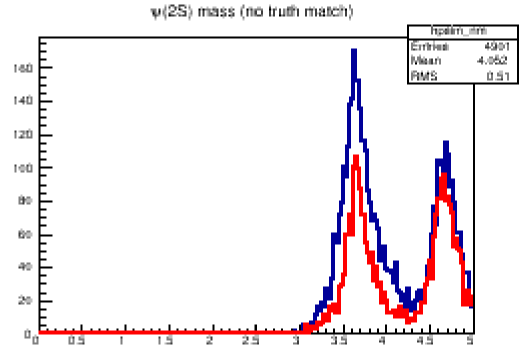


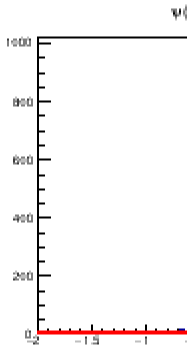

J/ψ mass (tight pid)

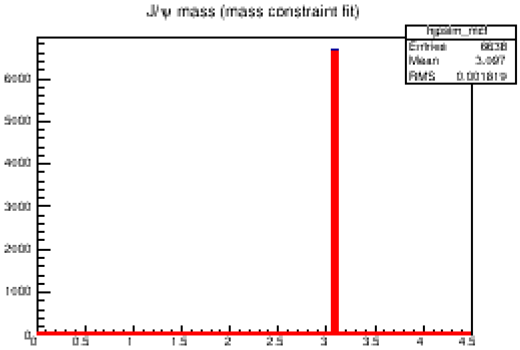

ψ(2S) mass (tight pid)

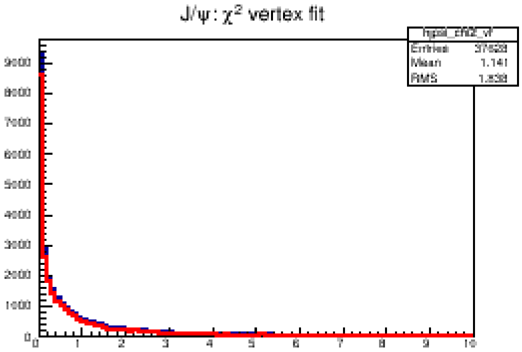


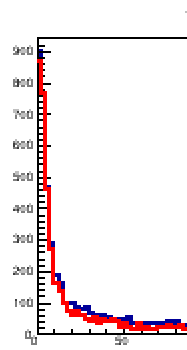

J/ψ mass (no truth match)

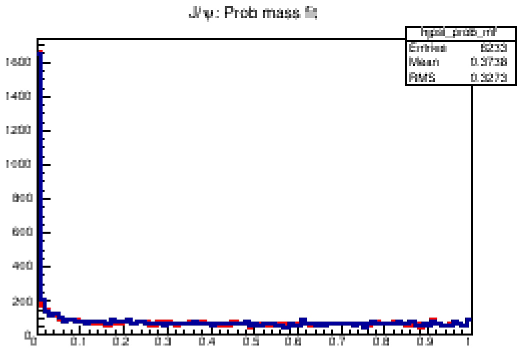

ψ(2S) mass (no truth match)



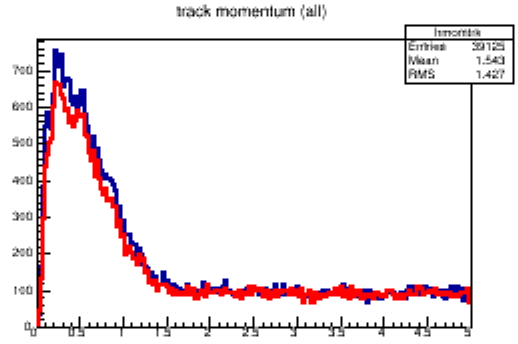

J/ψ mass (mass constraint fit)

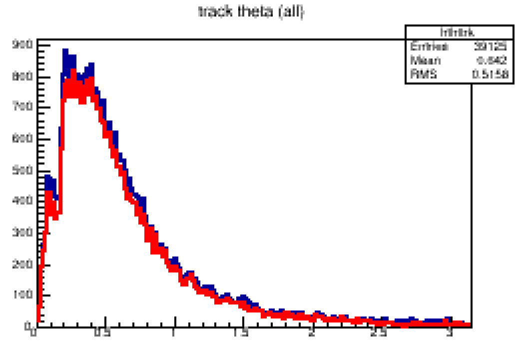

J/ψ: χ^2 vertex fit

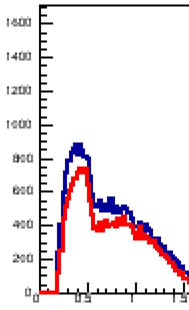


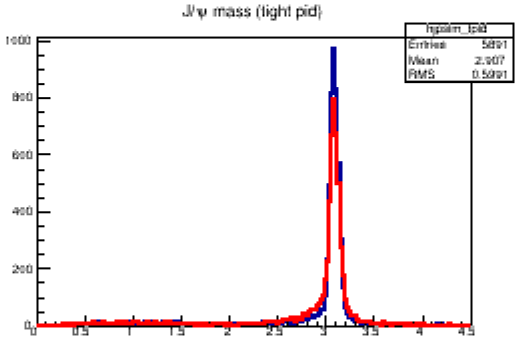

J/ψ: Prob mass fit

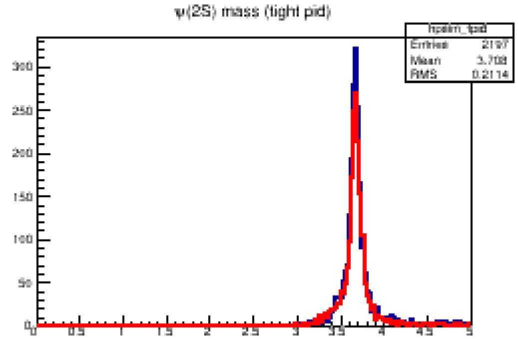
3) comp_gf23_gf.gif, downloaded 1101 times

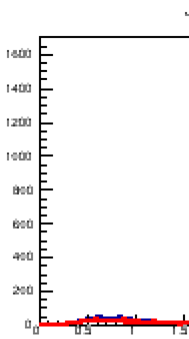

track momentum (all)

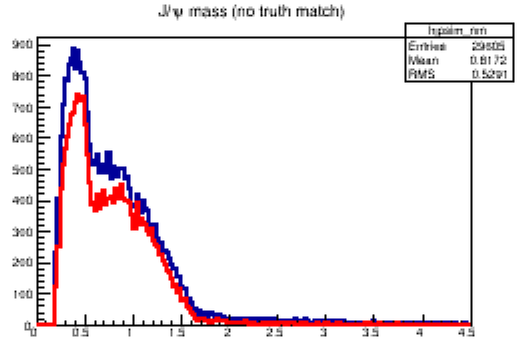

track theta (all)

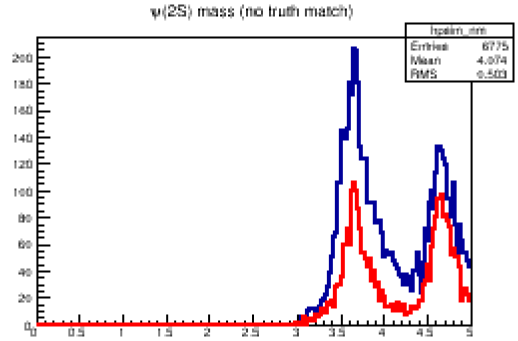


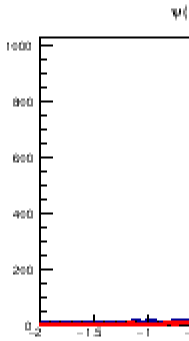

J/ψ mass (tight pid)

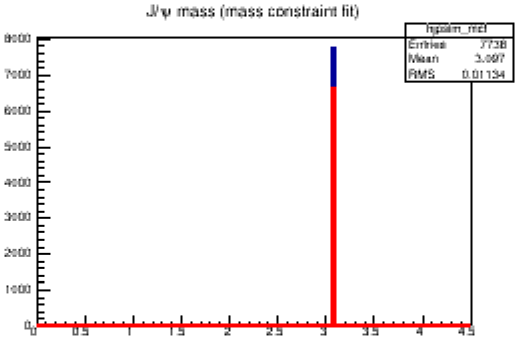

ψ(2S) mass (tight pid)

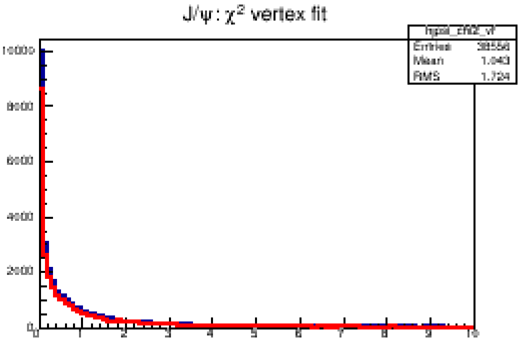


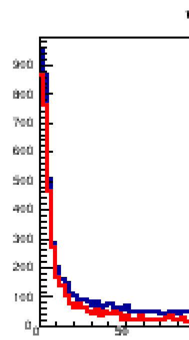

J/ψ mass (no truth match)

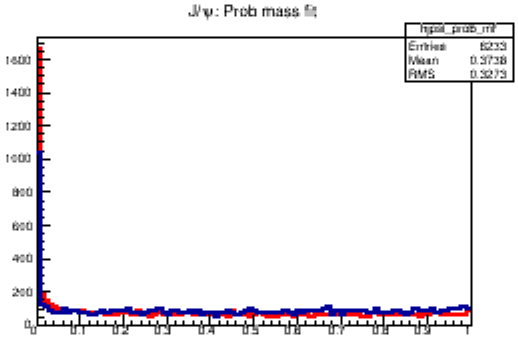

ψ(2S) mass (no truth match)




J/ψ mass (mass constraint fit)


J/ψ: χ^2 vertex fit




J/ψ: Prob mass fit