Subject: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Thu, 28 Nov 2013 16:07:39 GMT
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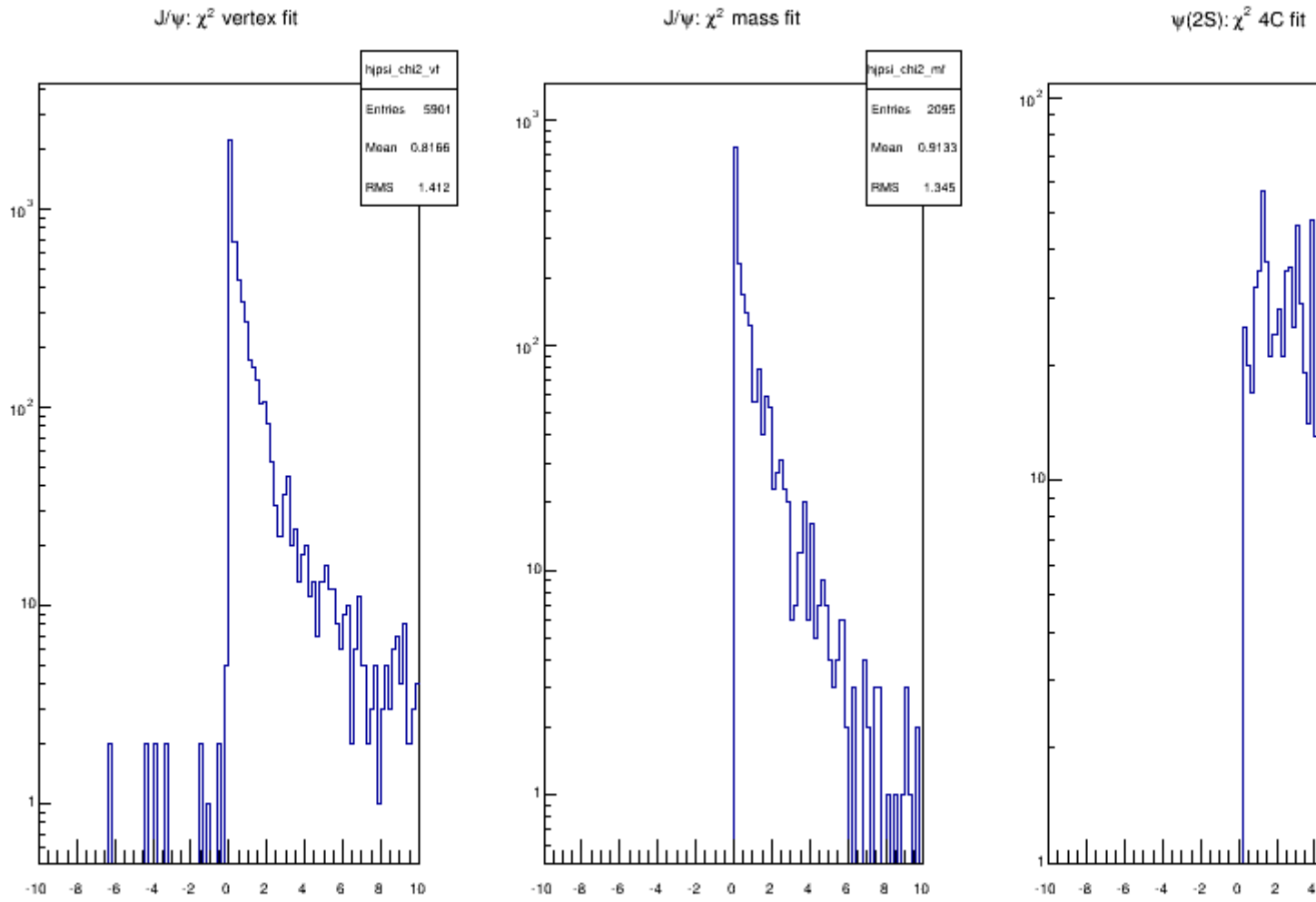
Dear analysis experts,
I run the standard macro/run/ana_complete.C macro and checked the chi2 distributions of the three fitters implemented there, vertex mass and 4C.
Here the plots:

You can see that the vertex fitters shows still negative values of chi2. I supposed this was fixed. Did I forget something, or maybe there is still something to debug?

File Attachments

1) chi2.gif, downloaded 708 times



Subject: Re: Chi2 of kinematic and vertex fitters
Posted by Elisabetta Prencipe (2) on Tue, 03 Dec 2013 10:49:48 GMT

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Hi Stefano,

I am running my test jobs in the pandaroot rev. 22626, and I found again negative chi2 of the vertex fit (only; the mass fit constraint does not give negatice chi2 in my case). The difference with the previous revision (rev 21003) is that now I get improvements: only decays where photons got involved give me few entries with negative chi2. In the previous revision (21003), I had many of them. Also, the efficiency is definitively improved in the new revision (22626): in the decay p pbar to Ds Ds1'(2536)+, Ds1'(2536)+ to D*0pi+, I have got:

rev 21003: 21% efficiency
rev 22626: 30% efficiency

cheers, Elisabetta

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by Ralf Kliemt on Tue, 03 Dec 2013 13:23:06 GMT
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Hi.

Please note that there are negative chisquare values for various failed fit conditions.

Ralf

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Fri, 06 Dec 2013 16:39:34 GMT
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Then the standard macro macro/run/ana_complete.C should be modified in order to do the proper selections.

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Tue, 10 Dec 2013 17:16:35 GMT
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I tried to do the following to avoid fit errors:

```
PndKinVtxFitter vtxfitter(jpsi[j]);     // instantiate a vertex fitter
if (!vtxfitter.Fit()) continue;
```

But I have still negative chi2. Maybe I missed something?

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by Jennifer Pütz on Mon, 06 Jul 2015 12:14:31 GMT
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Hi everyone,

I still have negative Chi2 when I use the kinematic and the vertex fitters. Has anybody an idea how to fix it?

Cheers

Jenny

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Mon, 06 Jul 2015 12:18:52 GMT
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Is it better to provide a code snipplet. There are several fitters.

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by Jennifer Pütz on Mon, 06 Jul 2015 12:56:09 GMT
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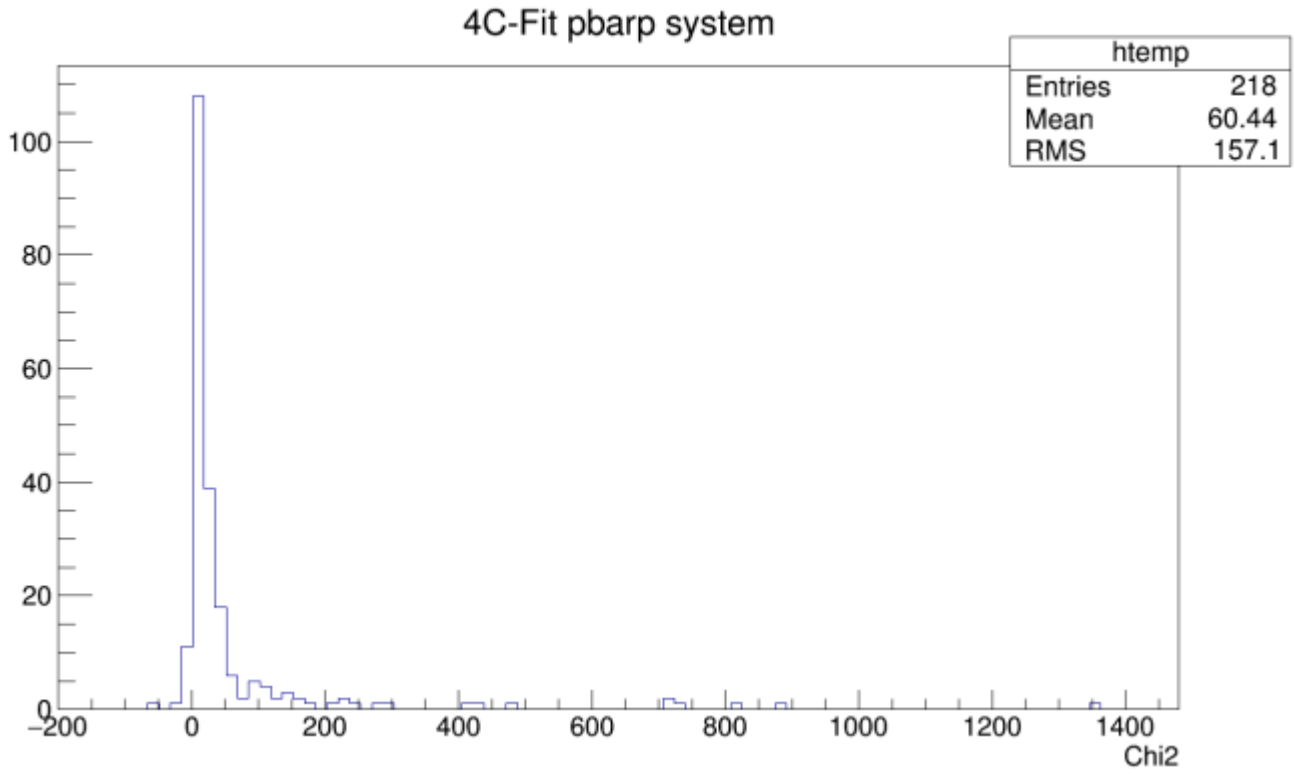
Ok, here is an example with negative Chi2 for the 4C-Fit (pbar p -> Lambda0 + AntiLambda0)

```
double pbarmom = 1.712;
double p_m0 = TDatabasePDG::Instance()->GetParticle("proton")->Mass();
TLorentzVector ini (0,0, pbarmom, sqrt(p_m0*p_m0+ pbarmom*pbarmom)+p_m0);

RhoCandList piplus, piminus, lambda0, antiLambda0, proton, antiProton, pbarpsystem,
Lambda0Fit, AntiLambda0Fit;

TString PidSelection = "PidAlgoIdealCharged";

theAnalysis->FillList(piminus, "PionAllMinus", PidSelection);
theAnalysis->FillList(piplus, "PionAllPlus", PidSelection);
theAnalysis->FillList(proton, "ProtonAllPlus", PidSelection);
theAnalysis->FillList(antiProton, "ProtonAllMinus", PidSelection);


int evt=0;
while (theAnalysis->GetEvent() && ++evt<nevts){


//***Lambda0 -> PiMinus + Proton
lambda0.Combine(piminus,proton);
lambda0.Select(lambdaMassSelector);
lambda0.SetType(3122);
```

```
for (int j=0; j<lambda0.GetLength(); ++j){

    PndKinVtxFitter vertexfitterLambda0 (lambda0[j]);
    vertexfitterLambda0.Fit();
    RhoCandidate * lambda0Fit = lambda0[j]->GetFit();
    Lambda0Fit.Append(lambda0Fit);


}

//***AntiLambda0 -> PiMinus + Proton
antiLambda0.Combine(piplus,antiProton);
antiLambda0.Select(lambdaMassSelector);
antiLambda0.SetType(-3122);


for (int j=0; j<antiLambda0.GetLength(); ++j){
    PndKinVtxFitter vertexfitterAntiLambda0 (antiLambda0[j]);
    vertexfitterAntiLambda0.Fit();
    RhoCandidate * antiLambda0Fit = antiLambda0[j]->GetFit();
    AntiLambda0Fit.Append(antiLambda0Fit);
}

pbarpsystem.Combine(Lambda0Fit, AntiLambda0Fit);
pbarpsystem.SetType(88888);

for (int j=0; j<pbarpsystem.GetLength(); ++j){
 PndKinFitter Fitter4c (pbarpsystem[j]);
 Fitter4c.Add4MomConstraint(ini);
 Fitter4c.Fit();
}

Lambda0Fit.Cleanup();
AntiLambda0Fit.Cleanup();
}
-------
```

File Attachments

1) 4C_negative_chi2.png, downloaded 472 times



Subject: Re: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Wed, 08 Jul 2015 08:49:36 GMT
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Can you post all the macros you used?

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by Jennifer Pütz on Wed, 08 Jul 2015 09:20:10 GMT
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attached you find the macros

File Attachments
1) sim_complete.C, downloaded 230 times
2) digi_complete.C, downloaded 222 times
3) recoideal_complete.C, downloaded 254 times
4) pidideal_complete.C, downloaded 224 times
5) analysis_pbarp_lambda0.C, downloaded 246 times
6) lambda0_antilambda0_piminus_p_piplus_antip.dec, downloaded 237 times

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Subject: Re: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Wed, 08 Jul 2015 09:26:11 GMT

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PndMCIdealTrackFinderNewLinks is not meant for analysis but just for QA, at the moment. Please use more standard reconstruction macros (-> macro/run/recoideal_complete.C).

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by Jennifer Pütz on Wed, 08 Jul 2015 13:28:22 GMT
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After I tried it with the standard reconstruction macro and now there are no negative chi2 for the 4c fitter.

Subject: Re: Chi2 of kinematic and vertex fitters
Posted by StefanoSpataro on Thu, 09 Jul 2015 09:39:39 GMT
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Then maybe there are problems of covariance matrix in the new ideal tracker, or most probably it is not properly linked to the pidcorrelator.