Subject: Invariant Mass Distribution Widening after 4C Fit
Posted by André Zambanini on Wed, 08 Jul 2015 07:37:40 GMT
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Hi everyone,

during my investigation of cascade reconstruction with PandaRoot, I found that after the four-constraint fitter my mass resolution got worse. You can see the difference in the plot I attached. Shown are the invariant mass distributions after applying a cut on the probability (>0.01) of the four-constraint fit, once with the pre-fit values (blue) and once with the values after the fit (green).

institute and it seems, others see a similar effect when having a mixture of neutral and charged candidates as input to the 4C fitter.

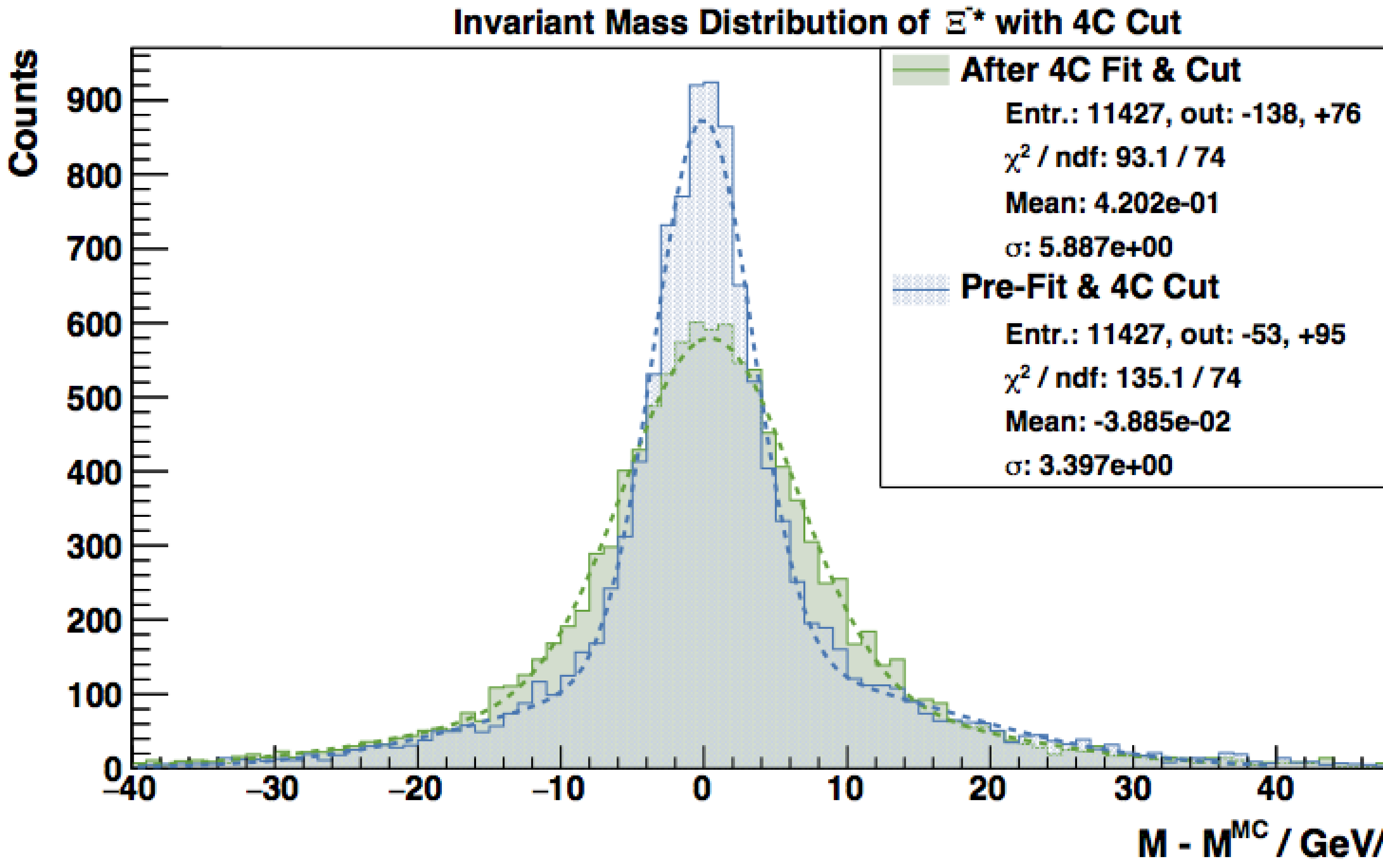
I'm running with trunk r27694 but it has been seen from others here with scrut14 as well. More details like a minimal running example will follow as soon as I have concluded my thesis, which is due in the next days. In the meantime: did anyone else see something like this? If so, is there an explanation to that?

Best,
-André

PS: The mass values are taken from the PndRhoTupleQA method qaCand().

File Attachments

1) dm_xi.png, downloaded 1281 times



Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by StefanoSpataro on Wed, 08 Jul 2015 08:03:01 GMT
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What are you constraining exactly? Are you sure all the particles you are constraining have a covariance matrix?

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by André Zambanini on Wed, 08 Jul 2015 08:10:48 GMT
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I'm constraining the fit probability that I get from curCand->GetFit()->GetProb() but I do that for both distributions. The only difference are the particle's parameters that are modified for the fit.

What the covariance matrix is concerned I don't know. I didn't store this information and I'll probably don't get to it before the 20th.

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by StefanoSpataro on Wed, 08 Jul 2015 08:18:37 GMT
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Ok, but what is curCand?

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by André Zambanini on Wed, 08 Jul 2015 08:29:13 GMT
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```
RhoCandList XibarXiSystem;
XibarXiSystem.Combine(aXiplusFitList, XiminusFitList);
for ( int i_sys = 0; i_sys < XibarXiSystem.GetLength(); i_sys++ ) {
   curCand = XibarXiSystem[i_sys];
   Pnd4CFitter fit4C(curCand, ini);
   fit4C.Fit();
   ...
}
```

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by StefanoSpataro on Wed, 08 Jul 2015 09:26:53 GMT
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It would be better to send all the macros you are using, to reproduce the problem.

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by André Zambanini on Wed, 08 Jul 2015 09:33:07 GMT
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I agree. However, I think my setup is not that easy to get running, so I would make a minimal example out of it. And this I would rather do after handing in my thesis.

My original intention was to ask around first if anybody else saw this in the past. The hunt for the source of this feature I wanted to postpone, otherwise I fear my deadline is endangered.

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by StefanoSpataro on Wed, 08 Jul 2015 09:38:17 GMT
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Are you using the standard ideal PR the new NewLinks code? The latter was never tested for analysis.

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by André Zambanini on Wed, 08 Jul 2015 09:41:56 GMT
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The latter, so PndMCIdealTrackFinderNewLinks(). But again, it has been seen by others here in Juelich as well, also with the default ideal pattern recognition.

Subject: Re: Invariant Mass Distribution Widening after 4C Fit
Posted by StefanoSpataro on Thu, 09 Jul 2015 13:50:39 GMT
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Which momentum smearing you added to the PndMCIdealTrackFinderNewLinks task? Maybe the covariance matrix is not properly filled there. At least it was never tested.