Subject: First test with fast sim: Ds(2536)+
Posted by Elisabetta Prencipe (2) on Thu, 03 Apr 2014 14:40:58 GMT
View Forum Message <> Reply to Message

Dear all,

I am trying to do again my simulations with the fast sim (trunk-rev-24275), and compare the results obtained with the full simulation.
I am not sure if I am doing the proper comparison, this is why I post plots and numbers which I obtain and ask to the physics convenors.

So, the channel under exam is:

pbar p ----> Ds- Ds1'(2536)+

Ds- --->K+K-pi-
Ds1'--->D*0 K+
D*0 --->D0 gamma
D0 ---->K-pi+

plab = 9.83 GeV/c
N_generated events with EvtGen = 10 000

I show you a comparison between the number of entries obtained in case I plot the mass (full simulation) and "m" (fast simulation). Here attached you can look at some distributions.

	D0 ----	Ds ----|	Ds1'
Fast	9962	15253	2960
Full	5127	2450	349 (ftm)
Full	8842	5307	2331 (best pid)
Full	10506	12204	1140 (true pid)

Looking at the distributions obtained from the fast simulation, their shape look similar to the ones obtained from the "tr_pid" in the full simulation. So, I guess this is what we should compare. Correct?
Here attached are some distributions of interest. Please do not be worry because of the fact that the efficiency of Ds1' looks so low: in the analysis I will use the missing mass of the Ds- to reconstruct it., and it improves a lot actually. Here I am just checking consistency with the full reconstruction of all decay products in this chain.

Best regards, Elisabetta

File Attachments
1) D2535_trpid_full10k.eps, downloaded 650 times
2) D0_trpid_full10k.eps, downloaded 633 times
3) Ds_trpid_full10k.eps, downloaded 651 times
4) Ds_fast.eps, downloaded 649 times
5) D0_fast.eps, downloaded 629 times

Subject: Re: First test with fast sim: Ds(2536)+
Posted by Elisabetta Prencipe (2) on Thu, 03 Apr 2014 14:53:29 GMT
View Forum Message <> Reply to Message

Some more addings to my previous post: for people who like to reproduce these results, this is how I filled up the lists:

```
// *** Select with no PID info ('All'); type and mass are set
theAnalysis->FillList(kplus,  "KaonBestPlus",  pidalg);
theAnalysis->FillList(kminus, "KaonBestMinus", pidalg);
theAnalysis->FillList(piplus, "PionBestPlus",  pidalg);
theAnalysis->FillList(piminus,"PionBestMinus", pidalg);
theAnalysis->FillList(gammas, "Neutral",pidalg0);
```

where:

```
TString pidalg = "PidChargedProbability";
TString pidalg0 ="PidNeutralProbability";
```

Best regards, Elisabetta

Subject: Re: First test with fast sim: Ds(2536)+
Posted by Klaus Götzen on Fri, 04 Apr 2014 05:51:02 GMT
View Forum Message <> Reply to Message

Hi Elisabetta,

that are fast first results!

I think in general, that the consistency between fast and full sim in terms of absolute numbers is not so important. In your case of selection I'm quite sure that the PID works better in fast sim, so that the 'BestPid' leads to something comparable to 'True PID' in full sim.

However, the question which now comes is: What detectors can be switched off or how worse resolutions and efficiencies for individual detector components are allowed to be without a too strong degradation of your figure of merits. That could be e.g. signal efficiency, signal to noise ratio, but maybe also something completely different.

You could e.g. turn off the barrel EMC, the Forward Spectrometer, the DIRC etc, and look,

what your results are compared to the full setup.

Best,
Klaus

Subject: Re: First test with fast sim: Ds(2536)+
Posted by Elisabetta Prencipe (2) on Fri, 04 Apr 2014 06:43:10 GMT
View Forum Message <> Reply to Message

Hi Klaus,

OK I'll try and I will let you know what changes if I switch off this or that detector.

Let's say, the steps now are:

a) update the release mar14
b) run full- and fast- simulation for the same channel, in the same release
c) check consistency of evt shape/distributions

this with all detectors included, in the fast simulation.

d) try to switch off this/that detector and see what changes
e) give feedback to this forum and/or to the regular meetings

Reading the email in the analysis forum, I would ask (as secondary order question, for the time being) what shall we do with the background: I mean, the main way to reject it is:

1) cut on the photon momentum
2) use the kinematic fit

in the charm analysis, at least.

Point 1) in fast simulations is OK. What about point 2) ?

Thank you for your reply,

Elisabetta

Subject: Re: First test with fast sim: Ds(2536)+
Posted by Klaus Götzen on Fri, 04 Apr 2014 12:23:36 GMT
View Forum Message <> Reply to Message

Hi again,

if you just have a bit more patience, I'll provide a modified simfast_opt.C, which allows to steer very easily several detector options with a parameters string. I'm just working on it, it should be available in 20 minutes or so. I'll announce it in this forum when it's in the release.

Of course I don't want to keep you from playing around...

Best,
Klaus

Subject: Re: First test with fast sim: Ds(2536)+
Posted by StefanoSpataro on Fri, 04 Apr 2014 14:48:10 GMT
View Forum Message <> Reply to Message

Could you please put your results into some slides, maybe overlapping full and fast distributions, and also a comparison of the resolution values?

Subject: Re: First test with fast sim: Ds(2536)+
Posted by StefanoSpataro on Fri, 04 Apr 2014 14:51:59 GMT
View Forum Message <> Reply to Message

I think it is still early to start this kind of tests switching off detectors.
Let's start to understand our fast sim first, and discuss on monday.
