Subject: Event filtering for lambda and lambdabar in DPM
Posted by donghee on Thu, 03 Apr 2014 22:20:31 GMT
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Hi Martin,

There are many of Lambda and Lambdabar events in DPM data at any beam momentum.That is some problem for the estimation of lambda efficiency using DPM.
We should take into account the fraction of lambda and lambdabar event and can subtract them according to DPM lambda fraction.
But I want to directly exclude those event in oder to compare correctly the efficiency and background reduction using DPM sample without lambda event and EvtGen data from pbar p -> Lambda Lambdabar production.
The procedure should be a veto of lambda and lambdabar.

You have implemented already such feature only for positive event selection in DpmDirect.
Could you show me the fast/effective way to reject them in the DPM production? I remember that you have an idea about that.
But I cannot see the method for veto.

Quote:

```
FairEvtFilterOnCounts* fil= new FairEvtFilterOnCounts();
primGen->SetFilterMaxTries(999999);
fil->AndMinMaxPdgCodes(0,5,211,-211); // max. 5 pions
fil->AndMinMaxPdgCodes(1,10,111); // min. 1 and max. 10 pi0
fil->AndMinMaxAllParticles(0,14); // max. 14 particles in total
fil->AndMinMaxCharge(1,5,'+'); // min. 1 and max. 5 pos. charged
primGen->SetVerbose();
fil->SetVerbose();
primGen->AndFilter(fil);
```

Thank you in advance!
Best wishes
Donghee

Subject: Re: Event filtering for lambda and lambdabar in DPM
Posted by donghee on Thu, 03 Apr 2014 23:47:01 GMT
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Hi Martin,

It seems to be working with this method.
Quote:

```
FairEvtFilterOnCounts* fil= new FairEvtFilterOnCounts();
primGen->SetFilterMaxTries(999999);
fil->AndMinMaxPdgCodes(0,0,3122,-3122); // set to 0 for lambda and lambdabar
primGen->SetVerbose(0);
fil->SetVerbose(0);
```

primGen->AndFilter(fil);

Could you confirm it?
Donghee

Subject: Re: Event filtering for lambda and lambdabar in DPM
Posted by MartinJGaluska on Fri, 04 Apr 2014 08:41:59 GMT
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Hello Donghee,

it is nice to see that the event filter on generator level is already being used.

For the moment, we have not implemented dedicated veto filters, but we will add this functionality in FairPrimaryGenerator. In the meantime we have focused on adding vertex, angles and momentum constraints, automated quality assurance and making the filter code easier to maintain. We will add the functionality of dedicated veto filters soon and will write a tutorial on how to use the event filters on generator level.

For the moment you can use the method as you wrote in your post. By requesting at least 0 and at most 0 of the particle species you define, you effectively have a veto filter. In future versions, we will provide a nicer interface for such cases.

Kind regards,
Martin

Subject: Re: Event filtering for lambda and lambdabar in DPM
Posted by StefanoSpataro on Fri, 04 Apr 2014 08:55:43 GMT
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Just to understand: what is the problem with lambdas and DPM? Was it reported to Aida?

Subject: Re: Event filtering for lambda and lambdabar in DPM
Posted by donghee on Fri, 04 Apr 2014 10:06:47 GMT
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Hi Stefano,

This is not a problem.
DPM events contains some amount of lambda and lambdabar particles.
When I compare the lambda and lambdabar MC data between DPM and EvtGen produced by pbar p -> L + Anti-L, I have to take into account the fraction of lambda and lambdabar event at DPM production in the estimation of efficiency or background reduction.
Otherwise the background efficiency should be too high in the event selection due to the

contamination of ordinary lambda particle in DPM. Lambda produced at DPM can have same signature as like lambda produced at EvtGen.
Of course, the size of lambda multiplicity depends on the given beam momentum due to different cross section.

There are few different solutions in my understanding.

1. exclude lambda particle during the DPM generation by Event filtering.
2. exclude lambda particle passed event selection when the DPM data is analysed only for lambda and lambdabar study.
3. get the fraction of lambda at the DPM generation, then use this fraction to scale down the background efficiency.
4. ignore lambda DPM produced, because the fraction should be small, is the level of below 1%, can be negligable quantity.

It is quite well known issue when we study the lambda and lambdabar production with DPM generator.

Best regards,
Donghee

Subject: Re: Event filtering for lambda and lambdabar in DPM
Posted by MartinJGaluska on Thu, 17 Apr 2014 13:46:53 GMT
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Just to inform you we have added dedicated veto filters to the latest version which is now uploaded in my development branch.
