Subject: pbarpSystem
Posted by Simon Reiter on Mon, 05 Aug 2013 10:47:21 GMT
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Hi all,

I was wondering why the mass of the pbarpSystem in evt.pdl is set to 2.98 GeV. How is this calculated and is this used in the simulation macro?
And why does it has a width of 0.1 GeV?

Additionally, please change the description in evt.pdl for the spin. It's J (total angular momentum quantum number) not S (spin)! It is just confusing..

Best regards,
Simon

Subject: Re: pbarpSystem
Posted by Klaus Götzen on Mon, 05 Aug 2013 12:14:39 GMT
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Hi Simon,

the values for the pbarpSystem are arbitrary and are setup with reasonable values when EvtGen starts - so the default values don't mean anything as far as I know.

Best,
Klaus

Subject: Re: pbarpSystem
Posted by StefanoSpataro on Mon, 05 Aug 2013 13:15:01 GMT
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Exactly.
And the "spin" is the EvtGen style, I will not touch it. In theory the user should not play with evt.pdl.

Subject: Re: pbarpSystem
Posted by Simon Reiter on Mon, 05 Aug 2013 13:33:01 GMT
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I just used it to modify evt.pdl for a dummy particle for my simulation to set mass, width and spin and it took me some time till I recognized, that is not the spin S.

Subject: Re: pbarpSystem
Posted by Jens Sören Lange on Mon, 05 Aug 2013 14:48:04 GMT

Hi Stefano, I disagree.

I think the user should actually not be discouraged to change evt.pdl.

1.) Our evt.pdl is hopelessly out of date, many masses and widths are wrong (it means different from PDG).

2.) The default width of the pbarsystem 0.1 GeV is definitely wrong (should be zero) and if we are not mistaken, it is probably not initialized by EvtGen with a "reasonable value". At least I see different results if you keep the default or you put in zero width "by hand" in the evt.pdl.

The default pbarpsystem mass of 2.98 GeV is maybe the eta_c mass. As Klaus says, it is overwritten when EvtGen starts, but you see what happened here: somebody put in whatever value into evt.pdl and then checked it into svn.

3.) modifying evt.pdl is still the best way to introduce a new particle.

So, I think, if you want to show any PandaRoot result on a conference (we want to show on the CHARM'13 in 3 weeks from now), we have to check and maybe modify the evt.pdl.

cheers, Soeren

Subject: Re: pbarpSystem
Posted by StefanoSpataro on Mon, 05 Aug 2013 17:09:19 GMT

Hi Soeren,
I was not clear, ok, I admit it.

I think it makes no sense to change from our side "spin" into "J", this is just semantics. The evt.pdl style, definition and header" come from EvtGen, maybe one could raise the question to the developers (I mean the Warwick team).

With the new EvtGen we have an updated evt.pdl (check EvtGenNew/EvtGen/Private). If we start to modify the definitions of the particles "randomly", this could be risky. Of course one can use the evt.pdl that he wants.
The basic idea should be that particle properties are modified inside the dec file, and not in the common evt.pdl, which is the standard for all the users and analyses.

About pbarpSystem definition, this is what was used for the physics book. I believe it was hardly checked, but it would be good if somebody could check again if the results are changed by modifying its properties.

Subject: Re: pbarpSystem

Posted by Simon Reiter on Tue, 06 Aug 2013 09:19:46 GMT
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How to define a new particle in the dec file? I though the dummies in evt.pdl should be used for that. And is this already possible in the apr13 rel?

Subject: Re: pbarpSystem
Posted by Elisabetta Prencipe (2) on Tue, 06 Aug 2013 22:21:39 GMT
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Hi Simon,

to simulate a new particle with EvtGen you can use the particles listed as 'dummiesXX' in the file evt.pdl. For instance, let's assume that you want to simulate a particle called Y, with mass = A, width = B, spin and charge set up to 0 (remember to pass the values of mass a width in [GeV]). Then you need to do the following in your file.dec:

```
##########################
Particle dummy00_1  A B
ChangeMassMin dummy00_1 [min-mass-value]
ChangeMassMax dummy00_1 [max-mass-value]
#
Alias MyY dummy00_1
Decay MyY
1.0 [daughter-one] [daughter-two] [daughte-whatever] [model]
Enddecay
```

Indeed, if you need to simulate a new particle of spin 1 and charge =0, then you need to use 'dummy01_1' in your file.dec; you can find the list of all dummy particles available in the file evt.pdl. By default, the dummy00_1 gives you a LundID = 51.

I hope it helps, Elisabetta

Subject: Re: pbarpSystem
Posted by Simon Reiter on Wed, 07 Aug 2013 09:24:25 GMT
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Thank you very much for this introduction.
But why do i have to use these?
   ChangeMassMin dummy00_1 [min-mass-value]
   ChangeMassMax dummy00_1 [min-mass-value]
I'd set the max deviation from mass in evt.pdl to 0. Is this possible, too?

Subject: Re: pbarpSystem
Posted by Elisabetta Prencipe (2) on Wed, 07 Aug 2013 09:51:05 GMT
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Hi Simon,

 it is your choice. You can also set up 0 as DeltaMass. I always prefer to set up a range. But basically it should work. You can try.

Elisabetta

Subject: Re: pbarpSystem
Posted by Simon Reiter on Wed, 07 Aug 2013 12:04:59 GMT
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When setting max deviation from mass in evt.pdl to 0, no mass cut is used. This does not seems possible here, except for setting ChangeMassMax to 0 and ChangeMassMin to something high like 10GeV.

Subject: Re: pbarpSystem
Posted by Elisabetta Prencipe (2) on Wed, 07 Aug 2013 12:36:29 GMT
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And what happens, then, if you comment the lines related to the Delta Mass cut in you file.dec? I see that in PandaRoot, in the file /EvtGen/evt.pdl, there is the possibility to set up a 'max_Dm/GeV'. The command which I suggested you, it allows to set up a min and max mass value. In my case it is taken into account: I just tried and on the prompt I see that the Delta Mass is reset according the the mass values which I just passed by my file.dec, while the sim-macro is running.
If you do not pass any value there, the default value 'max_Dm/GeV' of the dummyXX from the evt.pdl file is supposed to be used.

cheers, Elisabetta

Subject: Re: pbarpSystem
Posted by Simon Reiter on Wed, 07 Aug 2013 12:50:06 GMT
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If I delete the two lines i get the following error:

root.exe:
/home/panda/pandaroot/apr13/pgenerators/EvtGen/EvtGenBase/EvtIntervalFlatPdf.cc:19:
EvtIntervalFlatPdf::EvtInterv$

And if set to both to 0, i get the same error. If commented, it seems to work without errors.

Subject: Re: pbarpSystem

Posted by Elisabetta Prencipe (2) on Wed, 07 Aug 2013 14:48:58 GMT
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Hi Simon,
 to set up both value to 0 is not correct, as EvtGen is written in a way that a mass interval should be passed somewhere. Now, you can choose those limits your own, or you can accept the default value of Delta Mass of the dummyXX in evt.pdl; but it must be written somewhere. So, if you comment those 2 lines you accept the default setting in evt.pdl, and this should be fine.
When I generated my new particle, I set up the value depending on the limit of the PHSP distribution of the daughters of my new particle, and it worked out. I never tried without any Delta mass value.

Just one comment: you can decide in this way to set up the particle properties (not only the ones related to the dummy particles, but also for instance for the D0, Ks, Lambda..) from your file.dec, without modifying evt.pdl. You can redefine for the particle of the evt.pdl list the mass, width, Lund-ID,....this is still fine.

Dummy00_1, for instance, by default is just a particle with mass = 1 GeV/c^2, width = 0.1, LundID= 51, spin =0 and charge =0. No additional properties. From your file.dec you are able to redefine the mass and the width, as from the example I had sent you, and you accept by default the other properties of this dummy00_1 particle (spin, charge). Make sure in the simulation macro to set up properly the momentum value, depending on the mass of your new particle, and the name of the Resonant state, wherever it is called in the macro. You are now using a particle calle "dummyXX_Y", whatever it is in your case.

Elisabetta