
Subject: New pbarpSystem and pbardSystem implementations
Posted by [Stefano Spataro](#) on Tue, 13 Mar 2012 15:10:57 GMT
[View Forum Message](#) <> [Reply to Message](#)

Dear all,
few new implementations were done in EvtGen.

First all now, now you can set the spin of the initial pbar-p system, by using:

```
pbarpSystem0  
pbarpSystem1  
pbarpSystem2
```

The old pbarpSystem remains at the usual place, but please remember that it has spin 1 so you cannot use it with other models (i.e. the SVV used for eta_c).

Another note: if you use as initial state a particle, i.e. eta_c, in generation you will have an invariant mass resolution due to the particle width, and not to the beam momentum spread. For this reason we suggest to use pbarpSystem as initial state.

Moreover, thanks to Albrecht we have a new model to simulate collisions antiproton-deuteron. In this case you have to use "pbardSystem" as initial state, and write a DEC file such as:

```
noPhotos  
#  
Decay pbardSystem  
  1.0 p+ pbarnSystem DeuteronSpectator 1.0 1.16;  
Enddecay  
#  
Decay pbarnSystem  
  1.0 pi- phi PHSP;  
Enddecay  
#  
Decay phi  
  1.0 K+ K- VSS;  
Enddecay  
#  
End
```

Maybe Albrecht could comment about the parameters to provide to the DeuteronSpectator model.

Subject: Re: New pbarpSystem and pbardSystem implementations
Posted by [Albrecht Gillitzer](#) on Tue, 13 Mar 2012 16:16:10 GMT
[View Forum Message](#) <> [Reply to Message](#)

Hi,

Let me add some remarks concerning the pbar+d decay model:

It is based on one on-shell nucleon in the deuteron target not participating in the reaction (= the "spectator") while the other nucleon is off-shell to respect 4-momentum balance. The

momentum distribution is parametrized with a Hulthen function.
Usually the struck (off-shell) nucleon is the neutron while the proton is the spectator (otherwise one would prefer a free proton target). However the decay model should also work for the latter case if the decay file is written accordingly.

As Stefano mentioned, there are two parameters in usage of the decay model:

Decay pbardSystem

```
1.0 p+ pbarnSystem DeuteronSpectator 1.0 1.16;
```

Enddecay

1st parameter: maximum internal momentum in the deuteron in GeV/c

2nd parameter: minimum mass of the residual pbar+n system for the specified decay (in this case $M_{\phi}+M_{\pi^-}$).

I plan to give a more detailed explanation in the next CM.

Albrecht

Subject: Re: New pbarpSystem and pbardSystem implementations

Posted by [donghee](#) on Thu, 08 Nov 2012 10:28:21 GMT

[View Forum Message](#) <> [Reply to Message](#)

Dear all,

I want to use pbarpSystem1 producing a vector particle.
My decay file "MyDecay.dec" introduce

Quote:

noPhotos

#

Decay pbarpSystem1

```
1.0 D+ D- VSS;
```

Enddecay

#

Decay D-

```
1.0 K+ pi- pi- D_DALITZ;
```

Enddecay

#

Decay D+

```
1.0 K- pi+ pi+ D_DALITZ;
```

Enddecay

#

End

And simulation macro

Quote:

```
PndEvtGenDirect *evtGen = new PndEvtGenDirect("pbarpSystem1", "MyDecay.dec");
```

But it is not recognized at EvtGen...here is error message of PANDAroot.

Quote:

EvtGen:Unknown particle name:pbarpSystem1 on line 4

How can I use pbarpSystem1 in simulation?

Thanks.

Subject: Re: New pbarpSystem and pbardSystem implementations

Posted by [Stefano Spataro](#) on Thu, 08 Nov 2012 10:37:31 GMT

[View Forum Message](#) <> [Reply to Message](#)

Do you have the correct evt.pdl? Check there if your pbarpSystem1 is defined.

Subject: Re: New pbarpSystem and pbardSystem implementations

Posted by [donghee](#) on Thu, 08 Nov 2012 13:56:22 GMT

[View Forum Message](#) <> [Reply to Message](#)

Dear Stefano,

I used my own evt.pdl, after copy pbarpSystem0,1,2 into evt.pdl, works fine.

Thank you!