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Subject: Beam profile or interaction point  
Posted by [donghee](#) on Tue, 02 Jun 2009 12:47:15 GMT  
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Dear panda MC users,

I would like to study the effect of different beam profile or certain interaction point. I think that there is no way to study such kind of feature in the box generator. Does anyone have some experience of implementation for beam profile or different interaction point in the generator level. Then could you give me some comment what I have to care and where do I can find good reference in pandaroot framework.

Thank you very much

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Subject: Re: Beam profile or interaction point  
Posted by [Aida Galoyan](#) on Tue, 02 Jun 2009 13:43:21 GMT  
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Hi,

in the root-file produced after work of generator DPMGen we have for coordinate x,y,z of event vertex: Particles.fVx, Particles.fVy, Particles.fVz. They are equal 0.

To study of the effect of different beam profile, you have to smear the Particles.fVx, Particles.fVy, Particles.fVz, generate them by yourself. If beam is directed along axis Z, Particles.fVx and Particles.fVy must be sampled according to proposed beam profile. Particles.fVz must be sampled according to assumed thickness of target.

In generator PndJRGen, smearing of vertex is doing in the macro-files. For example ( in macros PndPi0PhiPhi.C),

```
>>>
// mean location of the target
//Vertex.SetXYZT(0,0,0,0); // zero by default

/* smearing of the primary vertex (Gauss with the above mean, and this sigma) */

/* TVector3 VtxRes(.1,.1,.2); // what target smearing do you want??? */
TVector3 VtxRes(0.0,0.0,0.0);

TParticle BeamTarget(999,1,0,0,0,0,s,Vertex);

PndReaction reaction(BeamTarget, VtxRes, "Gen_Pi02Phi.root" );
>>>
```

Aida

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Subject: Re: Beam profile or interaction point  
Posted by [StefanoSpataro](#) on Tue, 02 Jun 2009 13:55:08 GMT  
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Some time ago I have written a wiki page about vertex smearing.  
Try to take a look here:

<http://panda-wiki.gsi.de/cgi-bin/view/Computing/VertexSmearing>

P.S. What starts with "Cbm" now is called "Pnd" or "Fair", I have not updated the page.

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Subject: Re: Beam profile or interaction point  
Posted by [donghee](#) on Tue, 02 Jun 2009 14:14:07 GMT  
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Thank you for your helpful answer.

The script looks quite useful in any case.  
Actually, my output file is saved with primary vertex position (0,0,0) in the ascii file.  
I call this file in the macro level during the simulation run.

There are two choice.

I can make the smearing in the fortran code of generator, this is not convenient,  
or I can do it in the panda macro level.

I prefer the latter.

To do that, I have to keep momentum information from ascii file and just put smearing vertex position as you recommended.

Quote:

```
// mean location of the target  
Vertex.SetXYZT(0,0,0,0); // zero by default  
// smearing of the primary vertex (Gauss with the above mean, and this sigma)  
TVector3 VtxRes(.1,.1,.2); // what target smearing do you want???  
TParticle BeamTarget(999,1,0,0,0,0,s,Vertex);  
PndReaction reaction( BeamTarget, VtxRes, "PhiPhi.root" );
```

Quote:

```
FairPrimaryGenerator* primGen = new FairPrimaryGenerator();
```

```
fRun->SetGenerator(primGen);
```

```
PndPythiaGenerator* pygen=new PndPythiaGenerator(inFile.Data());  
primGen->AddGenerator(pygen);
```

```
fRun->SetStoreTraj(kTRUE);
```

I think that I have to combine some function of PndReaction with PndPythiaGenerator.  
I'm not clear what do I have to as a next step?  
Could you give me some hint?  
Thank you! Aida

Best regards,  
Donghee

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Subject: Re: Beam profile or interaction point  
Posted by [Aida Galoyan](#) on Tue, 02 Jun 2009 15:06:35 GMT  
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Hi again,

For Phytia just now, I look through the file /pgenerators/PndPythiaGenerator.cxx.

There is line

```
>  
primGen->AddTrack(pdgID, fPx, fPy, fPz, fVx, fVy, fVz);  
>
```

It seems to me, before this line, you can insert your smearing of fVx, fVy, fVz.

Aida

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Subject: Re: Beam profile or interaction point  
Posted by [Stefano Spataro](#) on Tue, 02 Jun 2009 17:47:27 GMT  
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Hi,  
the smearing can be done inside your PrimaryGenerator. You do not have to touch a single line of the code and compile, just add a line in your simulation macro. EWverything is written inside wiki.