Subject: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Tue, 12 May 2015 10:03:36 GMT
View Forum Message <> Reply to Message

Dear All,

I have generated single photon events for energy 1 GeV using box generator. Anyone please tell me how should I calculate the reconstructed photon energy for each event. I have tried and sum-up all the energy of all secondary particles for each event. But it gives me unexpected value having mean at nearly 4 GeV.

regards

Kamal Dutta
Gauhati University

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Tue, 12 May 2015 10:19:12 GMT
View Forum Message <> Reply to Message

PndEmcCluster::energy() from the digi file, or PndPidNeutralCand::GetEmcRawEnergy() (for raw energy) ::GetEmcCalEnergy() (for calibrated energy) if you start from the pid file.

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Tue, 12 May 2015 12:13:06 GMT
View Forum Message <> Reply to Message

Thanks. But I do not understand why its 259 entries in PndEmcCluster::energy() for 100 primary photons. It is like I have 259 EMC clusters for 100 primary photons. Can you help me get it ?

regards
Kamal Dutta

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Tue, 12 May 2015 12:19:20 GMT
View Forum Message <> Reply to Message

The others are secondaries. You can select GetMcIndex()==0 to have only the primaries (even if you should see still some split-off).

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Tue, 12 May 2015 12:31:13 GMT
View Forum Message <> Reply to Message

Hi, the problem is, if I am getting more reconstructed photons than generated, how can I relate them. I mean, If I want to have the energy difference between the generated i,e 1 GeV and reconstructed, how it is possible ? As per my knowledge, if a single photon hits the EMC crystal, the digitized output should give a single cluster which will estimate the energy of the primary photon. Thus for 100 primary photons, it should have 100 emc cluster and their energy accordingly. Please correct me if I am wrong.

regards
Kamal Dutta

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Tue, 12 May 2015 12:33:25 GMT
View Forum Message <> Reply to Message

Again, one photon interacts with materials and form different signals in the emc, then you can have more than 1 clusters. if you select the mc index you should isolare your primary photon.

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Tue, 12 May 2015 12:46:42 GMT
View Forum Message <> Reply to Message

Thanks, Where can I get GetMcIndex() ?

regards
Kamal Dutta

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Tue, 12 May 2015 12:47:48 GMT
View Forum Message <> Reply to Message

PidNeutralCand::GetMcIndex()

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Wed, 13 May 2015 06:47:37 GMT
View Forum Message <> Reply to Message

Thanks a lot. I have written a piece of code to access PndPidNeutralCand::GetEmcCalEnergy(), but getting error. I have attached both the code and errors. Please have a look.

regards

File Attachments
1) gam_conv_pid.C, downloaded 436 times
2) errors, downloaded 459 times

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Wed, 13 May 2015 07:08:29 GMT
View Forum Message <> Reply to Message

punk is a PndPidCandidate named "PidNeutralCand".

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Wed, 13 May 2015 10:16:08 GMT
View Forum Message <> Reply to Message

Hi Stefano,

I corrected according to you. Please look at the code. I have also attached the reconstructed photon energy plot. I am not understand how to accept it, as reconstructed photon energy of generated energy 1 GeV. It has 202 events and energy more that 1 GeV too. But the generated events are of 1GeV and 100 events.

File Attachments
1) gam_conv_pid.C, downloaded 429 times
2) gam_e.eps, downloaded 454 times

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Wed, 13 May 2015 10:20:12 GMT
View Forum Message <> Reply to Message

Again:

```
for (Int_t k = 0; k < ar_entries; k++){
     punkt = (PndPidCandidate*) hit_array->At(k);
->   if (punkt->GetMcIndex()!=0) continue;
```

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Wed, 13 May 2015 10:25:10 GMT
View Forum Message <> Reply to Message

It gives the same output.

Subject: Re: Reconstructed photon energy for single photon event
Posted by StefanoSpataro on Wed, 13 May 2015 10:32:00 GMT
View Forum Message <> Reply to Message

I suppose not exactly the same.
In any case, the peak around 1 is your primary photon while the low energetic part comes from

secondries and split-off. You can get rid of it with a simple energy cut. The position of the peak depends on the calibration.

Subject: Re: Reconstructed photon energy for single photon event
Posted by kamalpdutta on Wed, 13 May 2015 10:43:38 GMT
View Forum Message <> Reply to Message

But I am worried about the part above 1 GeV. How to estimate these values. If I want to estimate reconstructed photon energy for each of the primary photon and its start vertex of EM shower, how it is possible in this situation. The start vertex I calculated for 100 events using PndMCIndex. On the other hand, I got 202 reconstructed photon events from PndPidCandidate. It really puzzled me.
