Subject: problem with TPC recotasks

Posted by Anonymous Poster on Wed, 26 Mar 2008 14:48:43 GMT

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Dear All,

I tried to read the output from recotasks/demo/runDemo.C hich gives the TPC reco informations. Looking at the output, I couldn't understand what these means? May be Sabastian can clarify.

I did the following:

I generated an ASCI file using EvtGen where Lambda0 -> p + pi- i.e. I have two tracks in each event. Then I processed this ASCI file using recotasks/demo/runMC.C and did the reconstruction using recotasks/demo/runDemo.C. When I read back the output, I found in some events more than 2 tracks . I could not understand how will there be more than 2 traks, although I checked in my ASCI file that every event has 2 daughter particles (see below event # 7,17,18,21)

. Is it because of problem in track finding or somewhere else?

Also I found that sometimes the charge of the track has not been assigned properly. Although I have two tracks with different charge, after reco I got both the tracks have minus charge (see event # 2, 11). Below I have attached some of the sample events which I got reading back the output from runDemo.C

Regards,
Dipak
----
oot [0] .x readCov.C

PSaid instance created... access via gSaid->f()

- RTDB container factory CbmBaseContFact
- RTDB container factory PndFieldContFact
- RTDB container factory PndPassiveContFact
- RTDB container factory PndMvdContFact
- RTDB container factory PndEmcContFact
- RTDB container factory PndDrcContFact
- RTDB container factory PndTpcContFact
*** # of events are*** 100
Event number 0 # of Tracks *** 1
Tra 0 Charge 1 X -16.747 Y 16.3506 Z -39.5 px 3.88465 py -0.00267863 pz 3.87558

Event number 1 # of Tracks *** 2
Tra 0 Charge -1 X 14.5493 Y 10.6037 Z 34.7928 px 0.0324572 py 0.0902873 pz 0.0277852
Tra 1 Charge -1 X 2.28539 Y 15.3968 Z 104.689 px -0.0112328 py -0.0318623 pz 0.0144723

Event number 2 # of Tracks *** 1
Tra 0 Charge 1 X 3981.27 Y -4620.87 Z 59.4363 px -0.0764374 py -0.0364256 pz 3.99768e-07

Event number 3 # of Tracks *** 2
Tra 0 Charge -1 X 18.1297 Y -7.88997 Z 102.701 px -0.0199871 py 0.0731697 pz 0.0550785
Tra 1 Charge 1 X -8.04357 Y -13.8328 Z 79.8354 px 0.313145 py -0.467045 pz 0.00729652

Event number 4 # of Tracks *** 0

Event number 5 # of Tracks *** 1
Tra 0 Charge 1 X 14.4932 Y 20.3164 Z -39.5 px 0.0732066 py -0.215354 pz 0.190899

Event number 6 # of Tracks *** 2
Tra 0 Charge 1 X -16.2875 Y 22.2164 Z -39.5 px 0.109447 py 0.0529493 pz 0.0757195
Tra 1 Charge -1 X 16.5778 Y 13.4451 Z -19.0417 px -483.726 py -36.3041 pz 43.8332

Event number 7 # of Tracks *** 5
Tra 0 Charge 1 X -28.1871 Y 21.4809 Z -22.6166 px 0.653211 py 0.0789349 pz 0.228374
Tra 1 Charge -1 X -22.0976 Y 12.753 Z -39.5 px 0.028882 py 0.0178201 pz 0.0400436
Tra 2 Charge -1 X -26.4371 Y 10.2303 Z 109.5 px -0.00493088 py -0.021641 pz 0.0125179
Tra 3 Charge -1 X -2309.91 Y -905.189 Z -18.5144 px 0.0682634 py -0.103502 pz
6.62992e-07
Tra 4 Charge -1 X -28.5562 Y -19.799 Z -22.1854 px 0.14157 py 0.033315 pz 1.22712e-05

Event number 8 # of Tracks *** 2
Tra 0 Charge 1 X -10.1476 Y 11.5454 Z -39.5 px -0.0135848 py 0.0937649 pz 0.041209
Tra 1 Charge -1 X -150.194 Y -313.167 Z -21.3325 px 2.28237 py -2.28031 pz 0.00143165

Event number 9 # of Tracks *** 2
Tra 0 Charge -1 X 14.2827 Y 5.94202 Z 2.96579 px -0.09945 py 0.00658903 pz 0.00336191
Tra 1 Charge 1 X 4.76285 Y -14.1177 Z -9.91527 px 0.976674 py 0.705377 pz 0.0704686

Event number 10 # of Tracks *** 1
Tra 0 Charge -1 X -16.4429 Y -6.00127 Z -39.5 px 0.015696 py 0.0314541 pz 0.060695

Event number 11 # of Tracks *** 2
Tra 0 Charge -1 X -20.6108 Y 1.22641 Z 68.7282 px -0.0620658 py -0.0548972 pz 0.0512449
Tra 1 Charge -1 X -18.8106 Y 5.02412 Z 109.5 px -0.03703 py -0.0383048 pz 0.0425949

Event number 12 # of Tracks *** 1
Tra 0 Charge -1 X -20.8971 Y 3.83608 Z 109.5 px -0.0281832 py -0.0573962 pz 0.0723641

Event number 13 # of Tracks *** 1
Tra 0 Charge -1 X 14.7031 Y -4.89719 Z 59.3778 px -0.0284968 py 0.0582575 pz 0.0761729

Event number 14 # of Tracks *** 0

Event number 15 # of Tracks *** 0

Event number 16 # of Tracks *** 2
Tra 0 Charge 1 X 25.4481 Y -8.10828 Z -39.5 px -0.06413 py -0.0963606 pz 0.0835151
Tra 1 Charge -1 X 39.8213 Y -18.8374 Z -36.1188 px 0.488333 py -0.466666 pz 0.000520475

Event number 17 # of Tracks *** 8
Tra 0 Charge 1 X -24.7435 Y 9.13317 Z 32.776 px 0.0554125 py 0.0365731 pz 0.00527998
Tra 1 Charge -1 X -17.954 Y -8.7067 Z 49.0195 px 0.0141519 py 0.0127211 pz 0.0018827
Tra 2 Charge -1 X -19.6235 Y -5.91746 Z 109.5 px 0.0102983 py -0.0179815 pz 0.0287956
Tra 3 Charge -1 X -158.237 Y 265.351 Z 19.3713 px -2.00015 py -1.45596 pz 0.00351872
Tra 4 Charge 1 X 114.633 Y 81.1705 Z 38.2012 px -9.72854 py -4.38871 pz 0.0122738
Tra 5 Charge 1 X 74.1155 Y 211.621 Z 40.2999 px 2.27595 py -0.956916 pz 0.000188292

Tra 6 Charge -1 X 1.65834 Y -34.0729 Z 35.0441 px 2.01065 py -3.10046 pz 0.0518665
Tra 7 Charge 1 X -39.1129 Y -119.495 Z -22.5994 px -2.00464 py -3.3732 pz 0.000357283

Event number 18 # of Tracks *** 3
Tra 0 Charge -1 X 524.857 Y -561.08 Z -24.2246 px -8.39686 py 5.90047 pz 0.040944
Tra 1 Charge 1 X 15.3793 Y 4.40764 Z -30.7709 px 0.178252 py -0.11522 pz 0.0536989
Tra 2 Charge -1 X 160.747 Y 79.0774 Z 4.13246 px -0.498641 py 0.250221 pz 4.41802e-05

Event number 19 # of Tracks *** 0

Event number 20 # of Tracks *** 1
Tra 0 Charge 1 X 4.24132 Y -21.0757 Z -38.4338 px -0.0525996 py -0.0854074 pz 0.0178459

Event number 21 # of Tracks *** 4
Tra 0 Charge -1 X 29.4911 Y 11.6045 Z -1.98651 px -0.112404 py -0.0652394 pz 0.00529879
Tra 1 Charge -1 X -3.1149 Y 20.0906 Z 109.5 px -0.0270426 py -0.0866046 pz 0.0193046
Tra 2 Charge -1 X -16.6252 Y -13.8053 Z 80.0767 px -1.69861 py 0.657633 pz 0.0002828
Tra 3 Charge -1 X -352083 Y -14380.7 Z 33.5896 px 0.0547047 py -0.023798 pz 1.12696e-08

Event number 22 # of Tracks *** 1
Tra 0 Charge -1 X 15.377 Y 2.02839 Z 31.0931 px -0.0864643 py 0.0339366 pz 0.0356229

Event number 23 # of Tracks *** 2
Tra 0 Charge -1 X 14.0861 Y -10.9138 Z 104.748 px -0.0129369 py 0.0742157 pz 0.0548745
Tra 1 Charge 1 X 17.614 Y 6.86181 Z 88.4475 px -0.0218323 py 0.118866 pz 0.044237

Event number 24 # of Tracks *** 0

Event number 25 # of Tracks *** 1
Tra 0 Charge 1 X -11.1533 Y -8.5945 Z -29.378 px -0.101102 py -0.0127427 pz 0.0278101

Event number 26 # of Tracks *** 1
Tra 0 Charge -1 X -8.33865 Y -16.6349 Z -39.5 px -0.00618449 py 0.0409256 pz 0.0649452

Event number 27 # of Tracks *** 1
Tra 0 Charge 1 X 3.81983 Y 25.1401 Z -39.5 px 0.142333 py -0.12799 pz 0.157421

Event number 28 # of Tracks *** 3
Tra 0 Charge -1 X -5.88547 Y 19.7997 Z 78.5993 px -0.0757957 py 0.03218 pz 0.0586249
Tra 1 Charge -1 X -13.5205 Y 8.66591 Z 109.5 px 0.0197955 py -0.0234335 pz 0.0616484
Tra 2 Charge -1 X -30.5821 Y 35.2416 Z 37.4274 px 1.59898 py 5.04504 pz 0.00398372

Event number 29 # of Tracks *** 1
Tra 0 Charge -1 X 8.83989 Y -19.5796 Z -39.5 px -0.0409138 py 0.0384549 pz 0.0747907

root [1] .q

Hi!

The track finding is done with monte carlo ids in the demo. So if there have been secondaries they will appear in the track list. This can in principle even happen for delta electrons! Check the momentum of your tracks.

The momentum that has been reconstructed looks too low in most cases. At the moment I do not have an idea why this is so.

Charge reconstruction can go wrong for backward going tracks (theta>90deg) because of the issue of direction of flight versus direction of curvature. I do not remember now how it was done in the demo, but its an issue which has to be worked on. In general you cannot decide apriori which choice of sign is right because you do not know in which direction the particle flew. Only simple arguments are used at the moment.

Unfortunately I will not be able to work on this this week.

Regards, Sebastian.

Subject: Re: problem with TPC recotasks
Posted by asanchez on Thu, 27 Mar 2008 09:58:44 GMT

Hi Dipak,
maybe you can modify the line 120
at DemoPatternRecoTask.cxx in such way that
the track id only correspond to pi and protons
so instead of
   // cut on insane ids
 if(id>100000)continue;

try with

if(id>1)continue;

if i have well understood in this way
you will only consider particles
inmediately after decay.

mother id = -1(lambda)
      ||
      VV
decay particles id = 0 (pi proton)
      ||
      VV
decay particles id =1 (muons)

cheers
ALicia.

Subject: Re: problem with TPC recotasks
Posted by asanchez on Thu, 27 Mar 2008 10:04:33 GMT

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Hi Sebastian,

if i have well understood
only those particles flying in the forward
direction will be properly tracked(found and fitted)
So that means that probable decay particles(secondaries,
if they are emitted isotropically)
will be partially well reconstructed. Or i'm wrong.

best regrads
ALicia.

Subject: Re: problem with TPC recotasks
Posted by Anonymous Poster on Thu, 27 Mar 2008 10:36:31 GMT

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Hi Sebastian,

>The track finding is done with monte carlo ids in the demo. So if >there have been
secondaries they will appear in the track list. >This can in principle even happen for delta
electrons!
>Check the momentum of your tracks.

>The momentum that has been reconstructed looks too low in most >cases. At the moment I
do not have an idea why this is so.

About the lower values of the momentum for reconstructed tracks may be because the input
momentum of protons and pions are low. The Lambda is produced at rest and decays.
Following are some sample evets which I have used:

```
    3
 N   Id Ist  M1  M2  DF  DL    px      py      pz      E       t        x        y        z
 0  3122  2  -1  -1   1   2  0.0000  0.0000  0.0000  1.1157  0.0000  0.0000  0.0000  0.0000
 1  2212  1   0   0  -1  -1 -0.0408 -0.0498  0.0773  0.9436 52.5078  0.0000  0.0000  0.0000
 2  -211  1   0   0  -1  -1  0.0408  0.0498 -0.0773  0.1720 52.5078  0.0000  0.0000  0.0000


 1      3
 N   Id Ist  M1  M2  DF  DL    px      py      pz      E       t        x        y        z
 0  3122  2  -1  -1   1   2  0.0000  0.0000  0.0000  1.1157  0.0000  0.0000  0.0000  0.0000
 1  2212  1   0   0  -1  -1 -0.0965 -0.0033 -0.0281  0.9436 17.8040  0.0000  0.0000  0.0000
 2  -211  1   0   0  -1  -1  0.0965  0.0033  0.0281  0.1720 17.8040  0.0000  0.0000  0.0000
```

```
2    3
 N    Id Ist  M1  M2  DF  DL    px      py      pz       E       t      x      y      z
 0  3122  2  -1  -1   1   2 0.0000  0.0000  0.0000  1.1157  0.0000  0.0000  0.0000  0.0000
 1  2212  1   0   0  -1  -1 -0.0718 -0.0704  0.0009  0.9436 130.3815 0.0000  0.0000
0.0000
 2  -211  1   0   0  -1  -1 0.0718  0.0704 -0.0009  0.1720 130.3815 0.0000  0.0000
0.0000
```

Regards,
Dipak

Subject: Re: problem with TPC recotasks
Posted by Anonymous Poster on Thu, 27 Mar 2008 13:01:32 GMT
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Hi Alicia,
Just changing (id>100000) to (id>1) doesn't work. If I do that, then after reconstruction most of
the events have only only one track or even Zero. Could you please let me know how to get
the only the primary particles (for Lambda0 case only proton and pion).
What does the "unsigned int id=point->GetTrackID();" do? In some cases this id are >2000 or
>3000. What are these values?

Best Regards,
Dipak

Subject: Re: problem with TPC recotasks
Posted by asanchez on Thu, 27 Mar 2008 13:25:20 GMT
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the TrackId so far i know, is the number
associated to one particle in the stack.
As the particles are entering the volume
they are listed in the stack.
-1 0 1 2 ....

particles (primaries) get number -1
their secondaries or decay products
are getting a new id = -1 + 1, as they are produced
and so on.

The track id 2000 are mainly secondaries(e-+,mu-+,ions..)
that is what i have understood up to know.

best regrads

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Alicia.

Subject: Re: problem with TPC recotasks
Posted by StefanoSpataro on Thu, 27 Mar 2008 14:49:09 GMT
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Alicia Sanchez wrote on Thu, 27 March 2008 14:25the TrackId so far i know, is the number associated to one particle in the stack.
As the particles are entering the volume
they are listed in the stack.
-1 0 1 2 ....

particles (primaries) get number -1
their secondaries or decay products
are getting a new id = -1 + 1, as they are produced
and so on.

Just to correct,
the TrackId starts from 0 (or 1, I do not remember now). MotherId starts from -1. MotherId is equal to the TrackId of the mother particle. This means that, if the particle is primary, it has no mother -> MotherId = -1 (dummy number, there are no particles with trackId = -1).

Subject: Re: problem with TPC recotasks
Posted by asanchez on Thu, 27 Mar 2008 15:15:37 GMT
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Yes, sorry
you are right.