

Hi,

I took another look to the track doublers and the multiple MC match (multiple tracks point to the same MC truth object) issue for release dec13 and a current trunk (rev 23404).

Therefore I ran the standard macros in macro/run and afterwards a modified ana_complete.C

The subroutine to count the doublers is essentially a nested loop to compare each track pair in the charged list and looks like this:

```
double d=0.0001;
for (int i=0;i<l.GetLength()-1;++i)
{
  for (int j=i+1;j<l.GetLength();++j)
  {
    TLorentzVector dl = l[j]->P4() - l[i]->P4();
    bool chkmc = (l[i]->GetMcTruth()==l[j]->GetMcTruth());
    bool chktrk = (fabs(dl.X())<d) && (fabs(dl.Y())<d) && (fabs(dl.Z())<d) && (fabs(dl.E())<d);
    if (chkmc) n_smc++; // double MC reference
    if (chktrk) n_strk++; // double track
    if (chktrk && chkmc) n_both++; // both at the same time
  }
}
```

I summed these counters for 100 psi' -> J/psi (mu+ mu-) pi+ pi- events (expected total primary #tracks = 400) and the results were:

```
dec13 -> Trk:470 Dbl trk:66 Dbl MC:170 Both:66
trunk -> Trk:324 Dbl trk:0 Dbl MC:27 Both:0
```

So for release dec13 we see many more tracks (+150 compared to current trunk), which obviously cannot be explained purely with the track doublers, which are only counted to be 66. The number of double MC references is also much higher. All double tracks seem to point to the same MC object (at least this is consistent...)

Concerning MC truth tree matching, for my J/psi example, I got the following number of events with more than 1 truth matched composite (J/psi and psi')

```
dec13 -> #ev(mult J/psi):62/100 #ev(mult psi'):27/100
trunk -> #ev(mult J/psi):11/100 #ev(mult psi'):2/100
```

My conclusion is (maybe limited due to the low number of events):

- The double track issue seems to be solved, since no double tracks are present in the current

trunk (in this example).

- The MC doublers issue also is improved, but it still might spoil efficiency calculations due to too large number of truth match composites, perhaps faking a too good efficiency.
- The dec13 release basically seems unusable for anything with this huge problem. It might be a good idea to either remove it or patch it in the sense, that the track doublers vanish.

Best regards,
Klaus

Subject: Re: Double tracks/double MC match issue
Posted by [Stefano Spataro](#) on Fri, 31 Jan 2014 14:30:39 GMT
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Hi Klaus,
thanks for the check,
since in the meantime Gianluigi did other modifications of the tracking code, could you please check also version 23647? If it is still fine, I will create a release jan14.

Subject: Re: Double tracks/double MC match issue
Posted by [Klaus Götzen](#) on Fri, 31 Jan 2014 15:37:07 GMT
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Hi,

I just did an 'svn up', but I didn't see new code in tracking except in macro/gem and geometry. I think my trunk was sufficiently up-to-date.

Best,
Klaus

Subject: Re: Double tracks/double MC match issue
Posted by [Stefano Spataro](#) on Fri, 31 Jan 2014 15:40:43 GMT
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I can see that in versions 23424 and 23425 tracking package was updated.

Subject: Re: Double tracks/double MC match issue
Posted by [Klaus Götzen](#) on Fri, 31 Jan 2014 16:04:33 GMT
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I don't know, maybe I have mistyped before. I'm now at 23650, and the tracking package didn't get any updates with 'svn up'.

Subject: Re: Double tracks/double MC match issue
Posted by [Stefano Spataro](#) on Fri, 31 Jan 2014 16:09:15 GMT
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can you please do a svn info tracking ?

Subject: Re: Double tracks/double MC match issue
Posted by [Klaus Götzen](#) on Fri, 31 Jan 2014 16:25:32 GMT
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kgoetzen@lxsub20:/hera/panda/kgoetzen/pandaroot/trunk7/tracking\$ svn info
Path: .
URL: https://subversion.gsi.de/fairroot/pandaroot/trunk/tracking
Repository Root: https://subversion.gsi.de/fairroot
Repository UUID: 0381ead4-6506-0410-b988-94b70fbc4730
Revision: 23650
Node Kind: directory
Schedule: normal
Last Changed Author: turany
Last Changed Rev: 23599
Last Changed Date: 2014-01-25 21:32:30 +0100 (Sa, 25 Jan 2014)

Subject: Re: Double tracks/double MC match issue
Posted by [Stefano Spataro](#) on Fri, 31 Jan 2014 16:34:11 GMT
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Then it is already updaed, maybe you were not using 23404 but something mode "modern".

Subject: Re: Double tracks/double MC match issue
Posted by [Gianluigi Boca](#) on Fri, 31 Jan 2014 18:36:23 GMT
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Lieber Klaus (und Stefano)

the version of the Pattern Recognition offline presently in the trunk (say, version 23652) is the one I recommend to use.

The story is that before the last meeting, during a period of modification of my code, I left by

mistake an "experimental" version of the PR producing ghost tracks (thanks Maria for telling me the problem).

So, as soon as svn at GSI has worked again (last January 10th, approximately) I put everything in order again in svn.

THEREFORE :

if you (Klaus) are analysing J/Psi data with the present trunk version and have still problems BITTE tell me ASAP. In that case send me you SIM, DIGI, RECO macro and I will certify if the problem is the PatternRecognition ODER NICHT.

Danke Schoen und Tschüß

Gianluigi

Klaus Goetzen wrote on Fri, 31 January 2014 16:37Hi,

I just did an 'svn up', but I didn't see new code in tracking except in macro/gem and geometry. I think my trunk was sufficiently up-to-date.

Best,
Klaus

Subject: Re: Double tracks/double MC match issue
Posted by [StefanoSpataro](#) on Sun, 02 Feb 2014 21:41:18 GMT
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I created a new release jan14 with svn version 23650. This should contain the debugged code.
