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Subject: Different results for same information extracted in different ways

Posted by [Mamen](#) on Fri, 07 Nov 2014 12:42:11 GMT

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Hi guys,

I'm having a problem since yesterday with the way I extract de same information from a histogram. Doing it in different ways I get different results, but I don't understand why or what am I doing wrong. Maybe somebody can help me.  
I'll try to explain my problem in the best way I can.

I have a root file, let's call it Input.root, with a structure with two n-tuples:

truthTuple:

- eppx // ep: positive electron, px: component x of momentum
- empx // em: negative electron, px: component x of momentum
- eppy // ep: positive electron, py: component y of momentum
- empy // em: negative electron, py: component y of momentum
- eppz// ep: positive electron, pz: component z of momentum
- empz // em: negative electron, pz: component z of momentum
- and others, but let's keep only these for the example

recoTuple:

- eppid // Particle Identification for positron hypothesis 0: Charged, 1:Very loose, 2: Loose, 3: Tight, 4: Very Tight
- empid // Particle Identification for electron hypothesis 0: Charged, 1:Very loose, 2: Loose, 3: Tight, 4: Very Tight
- feppx // ep: positive electron, px: component x of momentum
- fempx // em: negative electron, px: component x of momentum
- feppy // ep: positive electron, py: component y of momentum
- fempy // em: negative electron, py: component y of momentum
- feppz// ep: positive electron, pz: component z of momentum
- fempz // em: negative electron, pz: component z of momentum
- and others, but let's keep only these for the example

Ok, So I define two histograms

```
True = new TH1D ("True", "True", Nbins, Bin_min, Bin_max);  
Reco = new TH1D ("Reco", "Reco", Nbins, Bin_min, Bin_max);
```

And after opening the root file I do:

```
TFile *t=new TFile("Input.root");  
  
TTree *truthTuple = (TTree*)t->Get("truthTuple");  
TTree *recoTuple = (TTree*)t->Get("recoTuple");  
  
// Projection of Real Statistics Files/* IT HAS TO BE DONE WITH THE REAL STATISTICS  
FILE*/  
truthTuple->Project("True", "variable", "eppid>3");  
recoTuple->Project("Reco",  
"(sqrt((feppe+fempe)**2-(feppx+fempx)**2-(feppy+fempy)**2-(feppz+fempz)**2))**2",
```

```
"eppid>3");
```

After this, if I do

```
Reco->GetEntries();
```

I get 2323 entries

if I do:

```
int TotalEntries=0;
for (int i=0; i <Nbins;i++ )
{
TotalEntries=TotalEntries+Reco->GetBinContent(i+1);// histograms start on bin=1 not bin=0
}
cout << "Total Reco Entries: "<< TotalEntries<< endl;
```

I get "Total Reco Entries: 2297", when I think the result should be the same than  
Reco->GetEntries();

Does anybody have an idea of what can I be doing wrong?

On the other hand, if I fill the histogram differently, i.e. setting branch addresses and filling after  
applying a cut,

I also get a different number of entries in the histogram.

That would be something like that:

```
// Variables to be read and filled recoTuple
float feppx;
float feppy;
float feppz;
float feppe;
float fepp3;
float fepcosth;
int eppid, ntrk;

recoTuple->SetBranchAddresses("feppx", &feppx);
recoTuple->SetBranchAddresses("feppy", &feppy);
recoTuple->SetBranchAddresses("feppz", &feppz);
recoTuple->SetBranchAddresses("feppe", &feppe);
recoTuple->SetBranchAddresses("fepp3", &fepp3);
recoTuple->SetBranchAddresses("epcosth", &fepcosth);
recoTuple->SetBranchAddresses("eppid", &eppid);
recoTuple->SetBranchAddresses("ntrk", &ntrk);

float fempx;
float fempy;
float fempz;
float fempe;
float femp3;
```

```

float femcosth;
int empid;

recoTuple->SetBranchAddresses("fempx", &fempx);
recoTuple->SetBranchAddresses("fempy", &fempy);
recoTuple->SetBranchAddresses("fempz", &fempz);
recoTuple->SetBranchAddresses("fempe", &fempe);
recoTuple->SetBranchAddresses("femp3", &femp3);
recoTuple->SetBranchAddresses("emcosth", &femcosth);
recoTuple->SetBranchAddresses("empid", &empid);

```

```

float fpi0px;
float fpi0py;
float fpi0pz;
float fpi0pe;

```

```

recoTuple->SetBranchAddresses("fpi0px", &fpi0px);
recoTuple->SetBranchAddresses("fpi0py", &fpi0py);
recoTuple->SetBranchAddresses("fpi0pz", &fpi0pz);
recoTuple->SetBranchAddresses("fpi0pe", &fpi0pe);

```

```

TH1D * RecoFill;
RecoFill = new TH1D("RecoFill", "RecoFill", Nbins, Bin_max, Bin_max);

```

```

long NEntriesReco=(long)recoTuple->GetEntries();
int kkk=0;

```

```

for (int k=0; k<NEntriesReco; k++)
{

```

```

    recoTuple->GetEntry(k);

```

```

    if( eppid>3)
{

```

```

        if (kkk % 10000 == 0 && kkk != 0)
        {
            cout<<"*** FILLING *** "<< kkk << " : " <<endl;
        }

```

```

        kkk++;

```

```

RecoFill->Fill((sqrt((feppe+fempe)**2-(feppx+fempx)**2-(fepyy+fempy)**2-(fepzz+fempz)**2))**
2);
    }
}

```

```

cout<< "RecoFill: "<< RecoFill->GetEntries()<<endl;

```

In this case I get that the number of Entries is 2239, again a number different from the two previous ones.

I am representing always the same variable, and I am applying always the same cuts in different ways.

Does somebody know what am i doing wrong?

I've tried doing it with two different macros and also at the same time inside a unique macro. Always I get the discrepancies. I have also tested the cuts, the variables, tried different ones, the number of bins, and bin limits in the histograms... I am now puzzled, and I really don't know how to continue...

Thank you very much in advance.

Cheers,

Mamen