$Ds \to \eta\mu\nu$ and other cool stuff

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Geo efficiency in new model staided the same: $eff = 0.183 + /0.010$
This is from 900k events. Waiting for gibbef background sample to give better fits.
For our standard bins there were to fiew events to performe a realible fit(see the zip file) New bins:

PID	**Geo**
-0.03	-1.0
0.03	0.44
1	1.0

CUTS

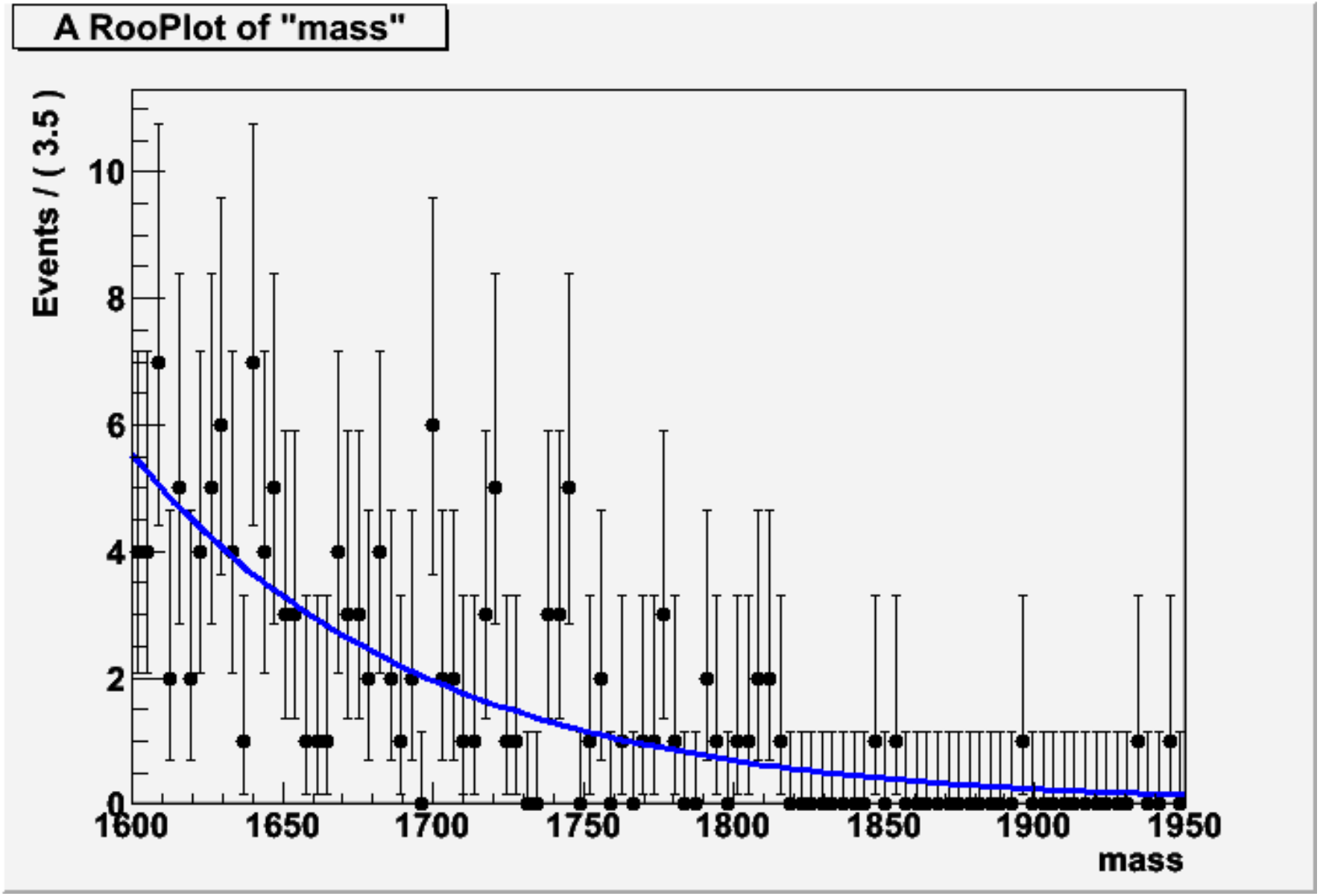
I used standard cuts:

- $mass(p0p1) > 250 MeV$
- $abs(mass(p0p2 - 1020 MeV)) > 20 MeV$
- $abs(mass(p1p2 - 1020 MeV)) > 20 MeV$

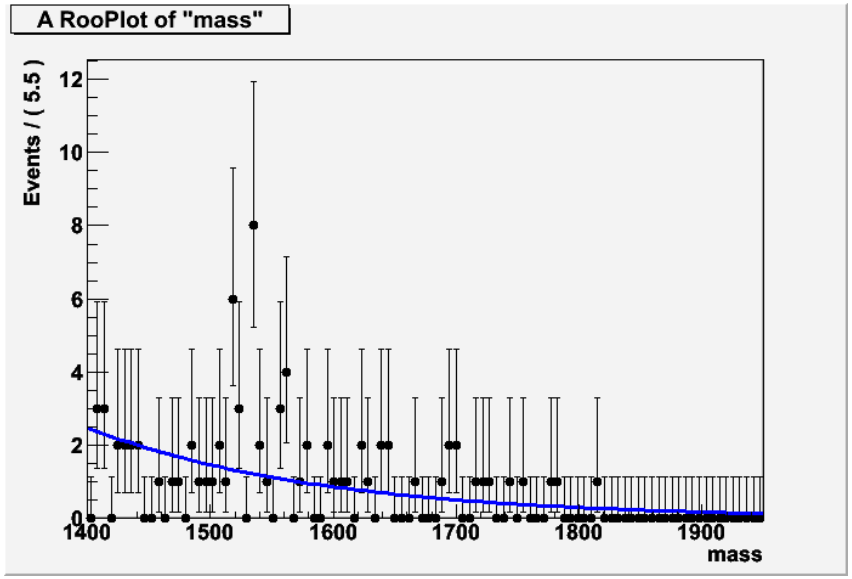
τ mass cut:

- $mass(\tau) \in (1600 - 1950) MeV$

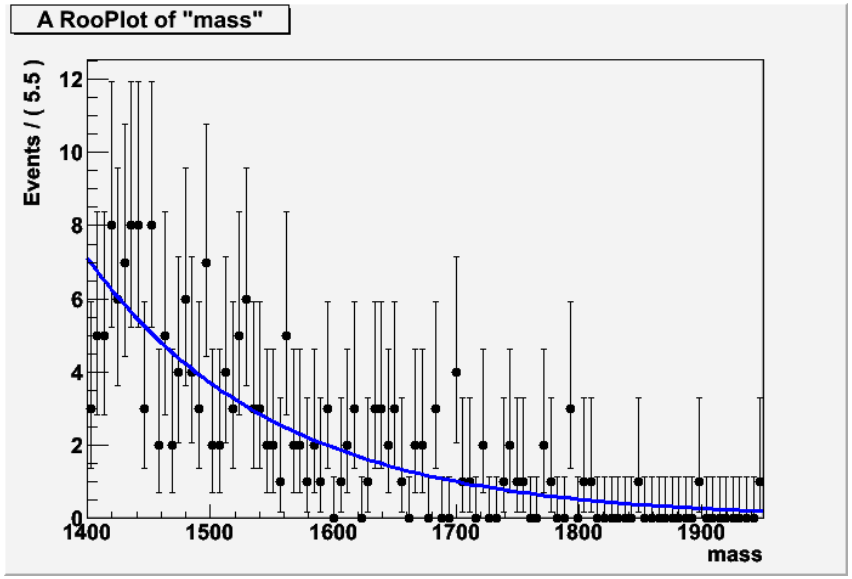
ONE BIN


A RooPlot of "mass"
Events / (3.5)
0
2
4
6
8
10
1600
1650
1700
1750
1800
1850
1900
1950
mass

FITS

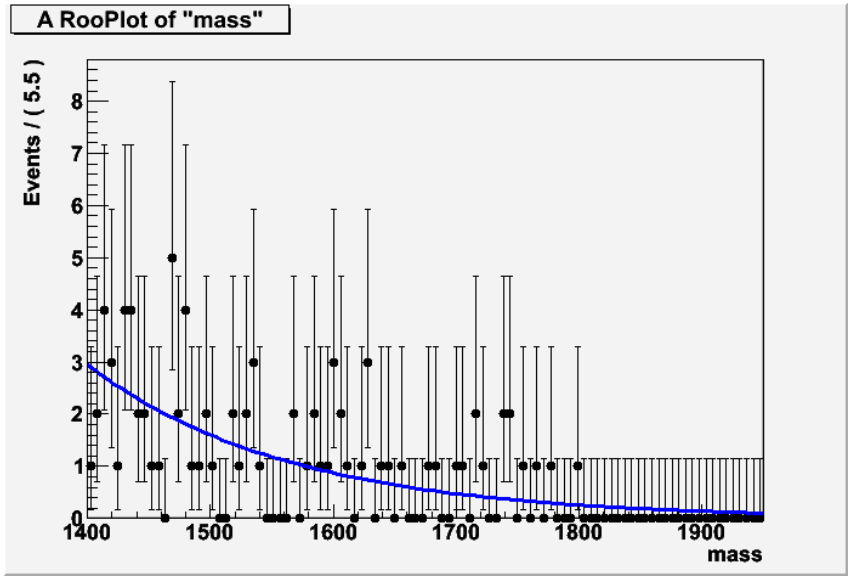


$Pid \in (0.03, 1),\ Geo \in (0.44, 1)$

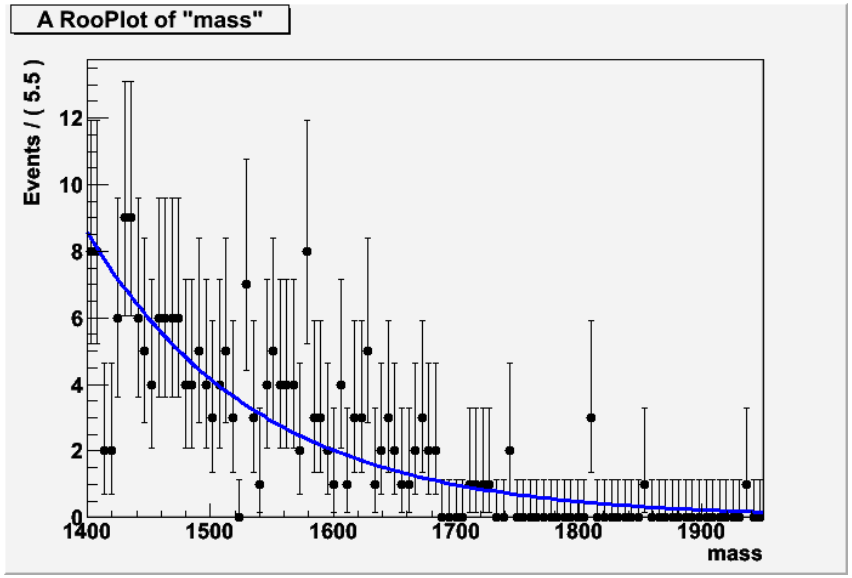


$Pid \in (0.03, 1),\ Geo \in (-1.0, 0.44)$

FITS

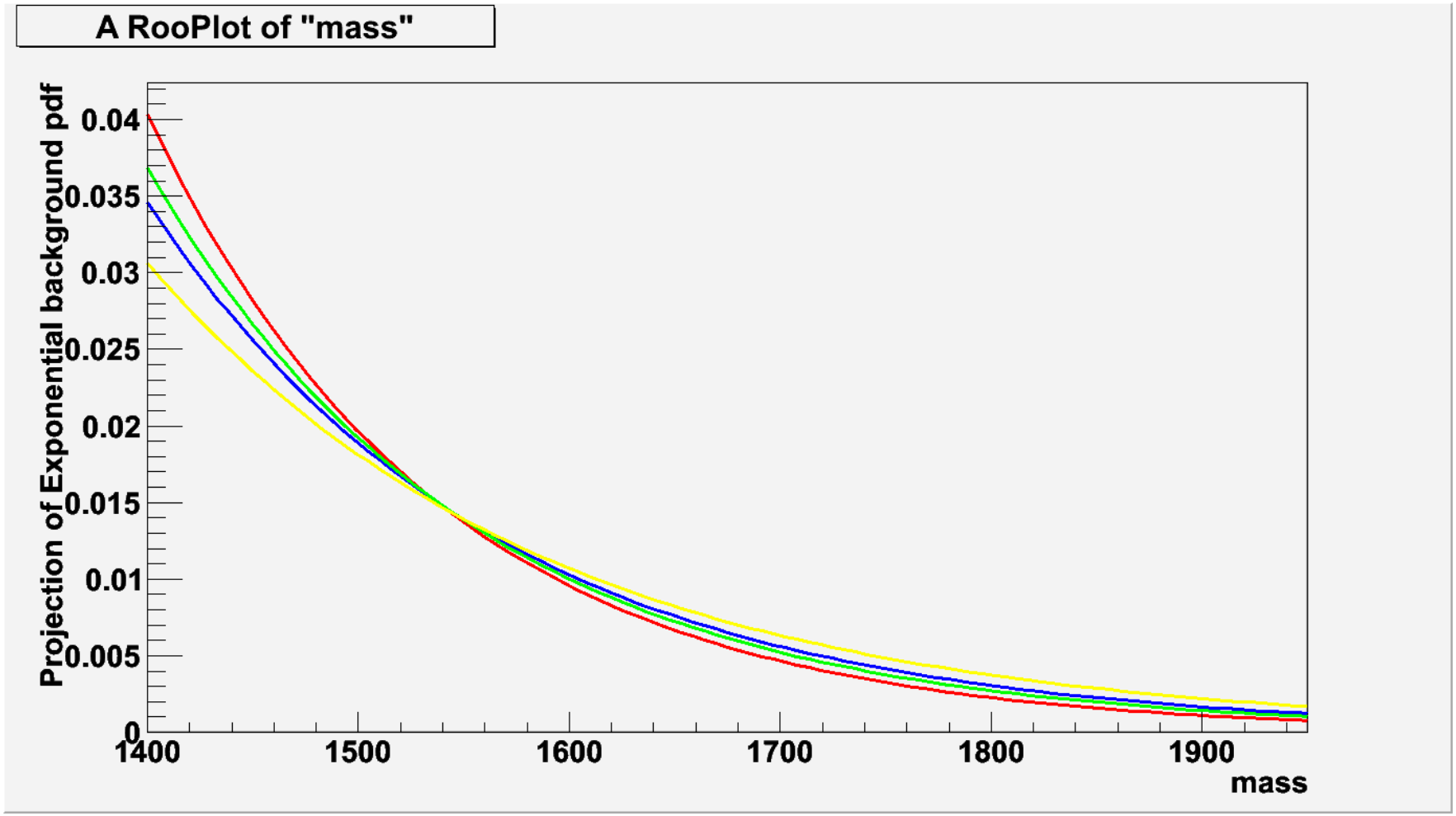


$Pid \in (-0.03, 0.03),\ Geo \in (0.44, 1)$



$Pid \in (-0.03, 0.03),$
$Geo \in (-1.0, 0.44)$

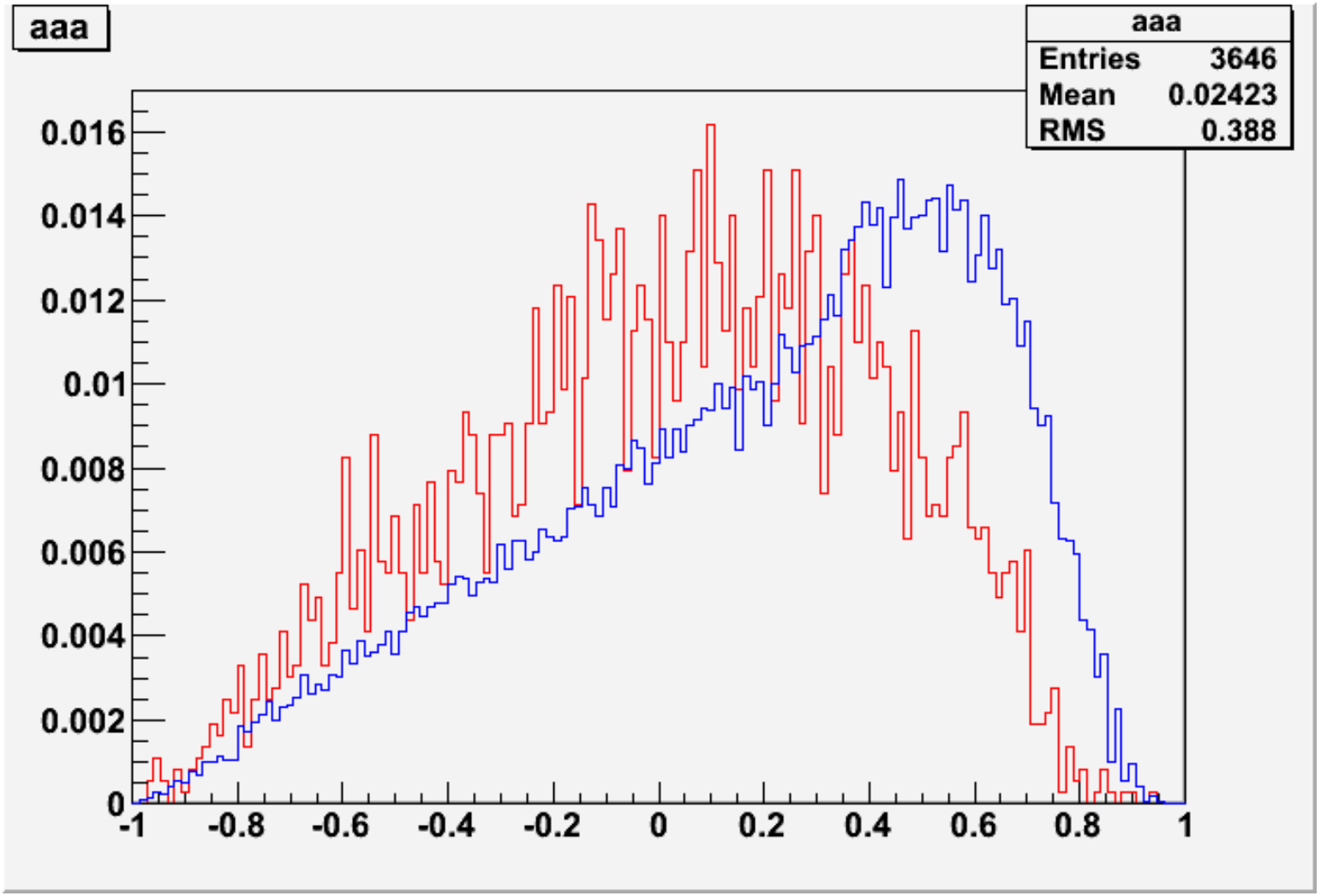
Why is 4 bins enought



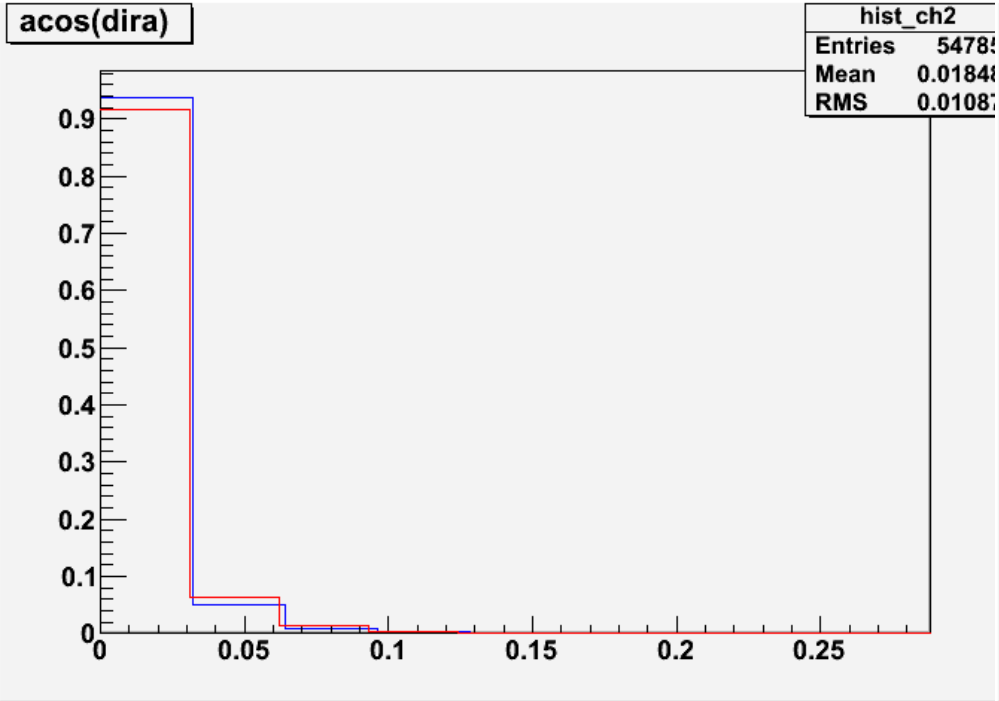
In the relewant mass region very small differance.

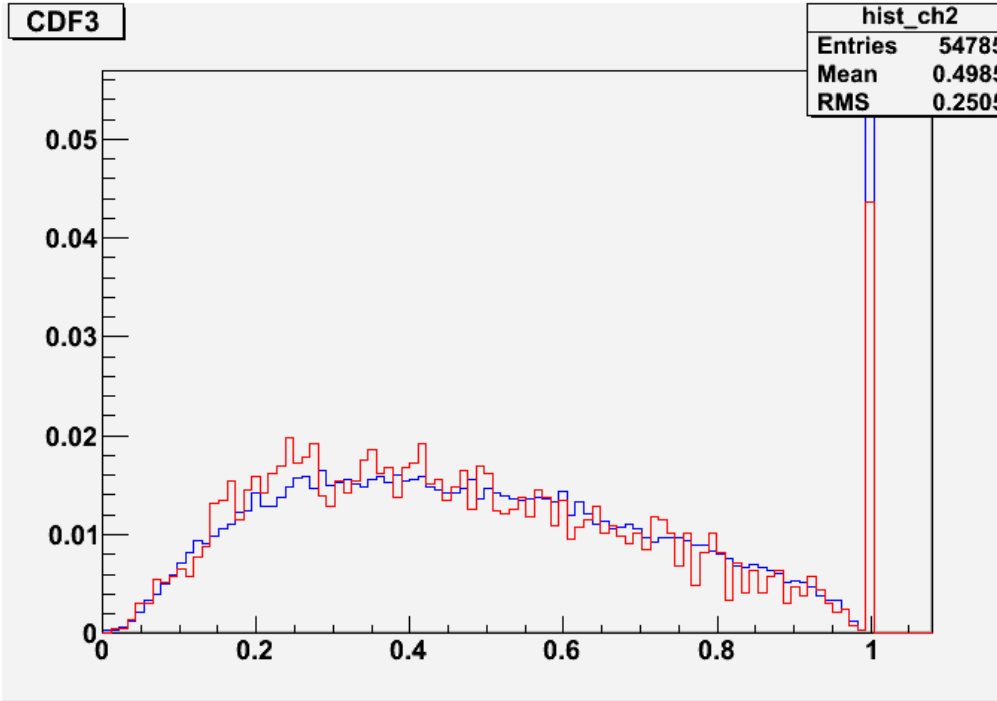
Geo response

There was a plan to normalise the $Ds \to \eta\mu\nu$ to $Ds \to \phi\pi$. Unfortunatly:

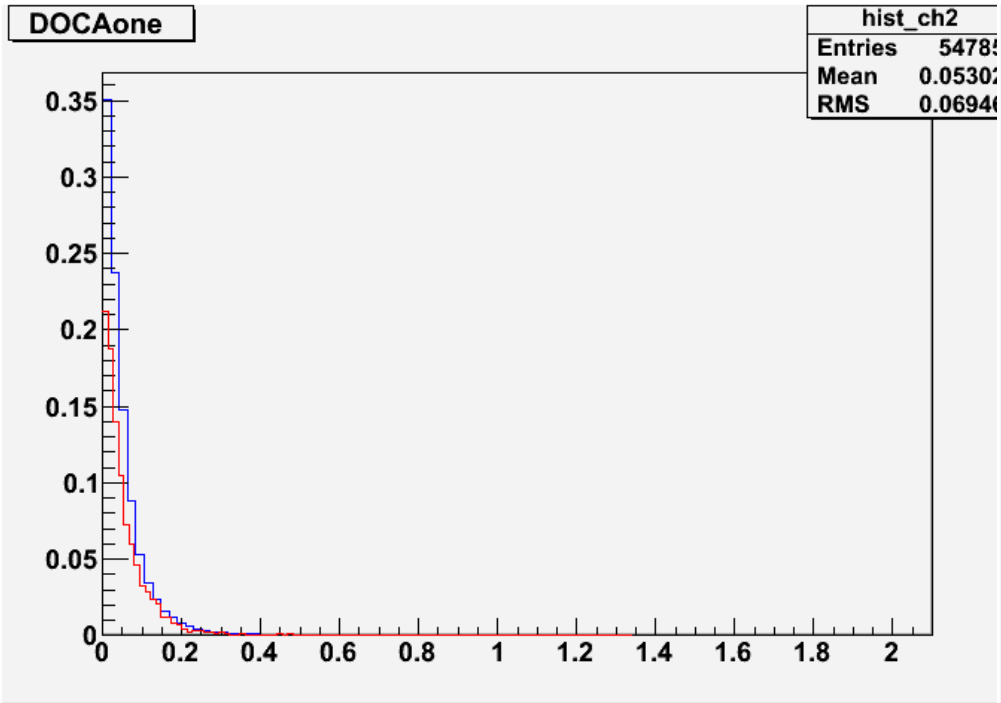


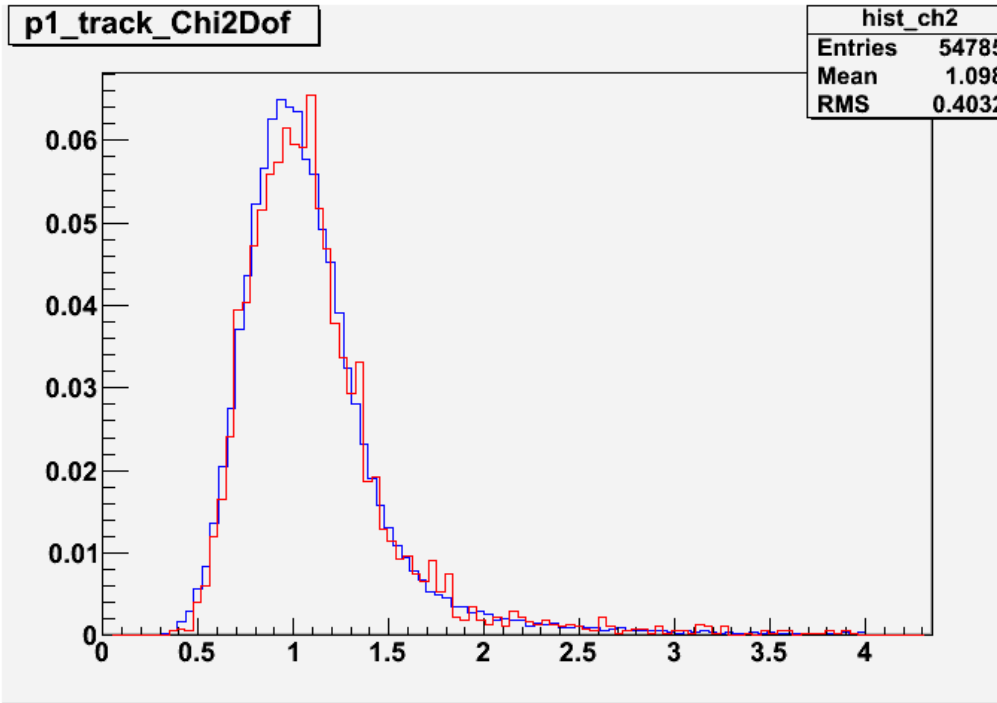
But:


acos(dira)
hist_ch2
Entries 5478
Mean 0.0184
RMS 0.0108
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.05
0.1
0.15
0.2
0.25

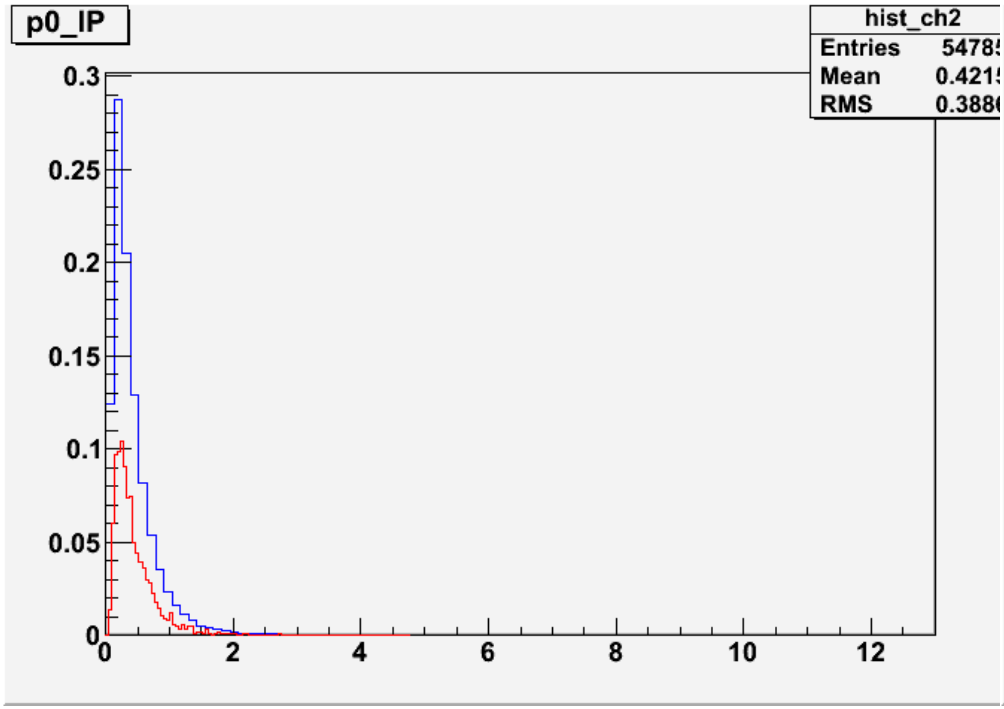

CDF3
hist_ch2
Entries 5478
Mean 0.498
RMS 0.250
0.05
0.04
0.03
0.02
0.01
0
0
0.2
0.4
0.6
0.8
1

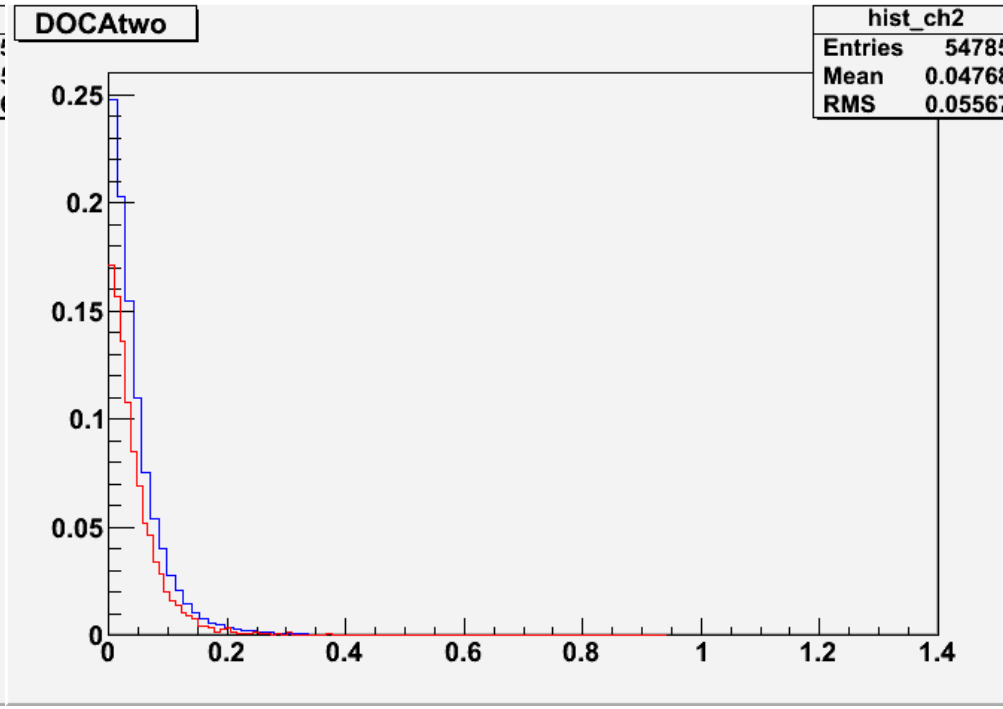
But:


DOCAone
hist_ch2
Entries 5478
Mean 0.0530
RMS 0.0694
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2

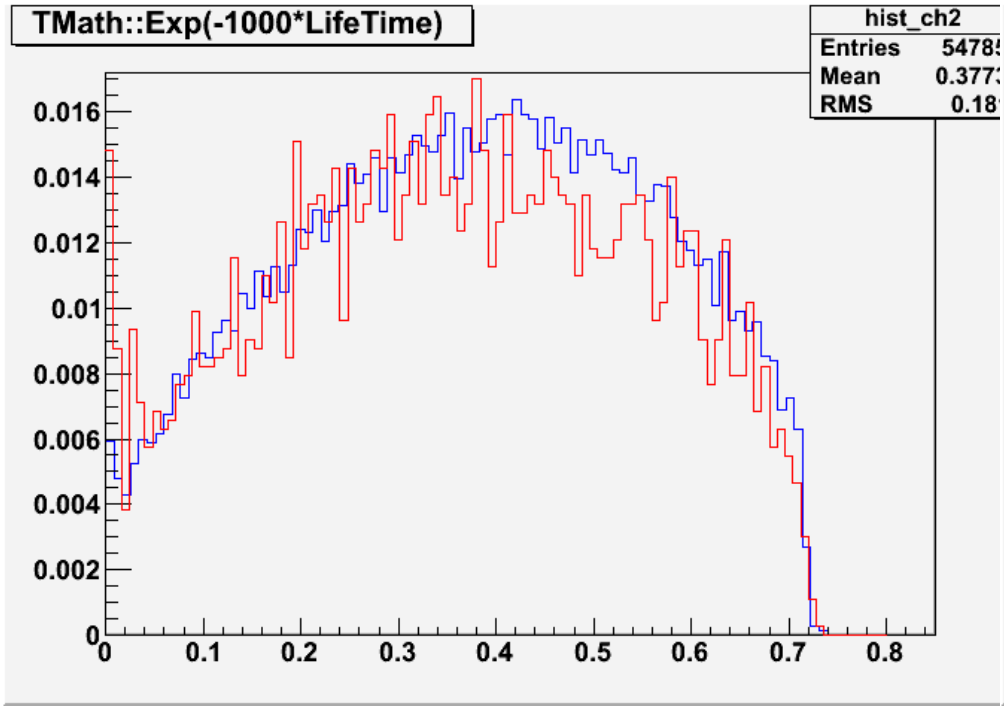

p1_track_Chi2Dof
hist_ch2
Entries 5478
Mean 1.098
RMS 0.403
0.06
0.05
0.04
0.03
0.02
0.01
0
0 0.5 1 1.5 2 2.5 3 3.5 4

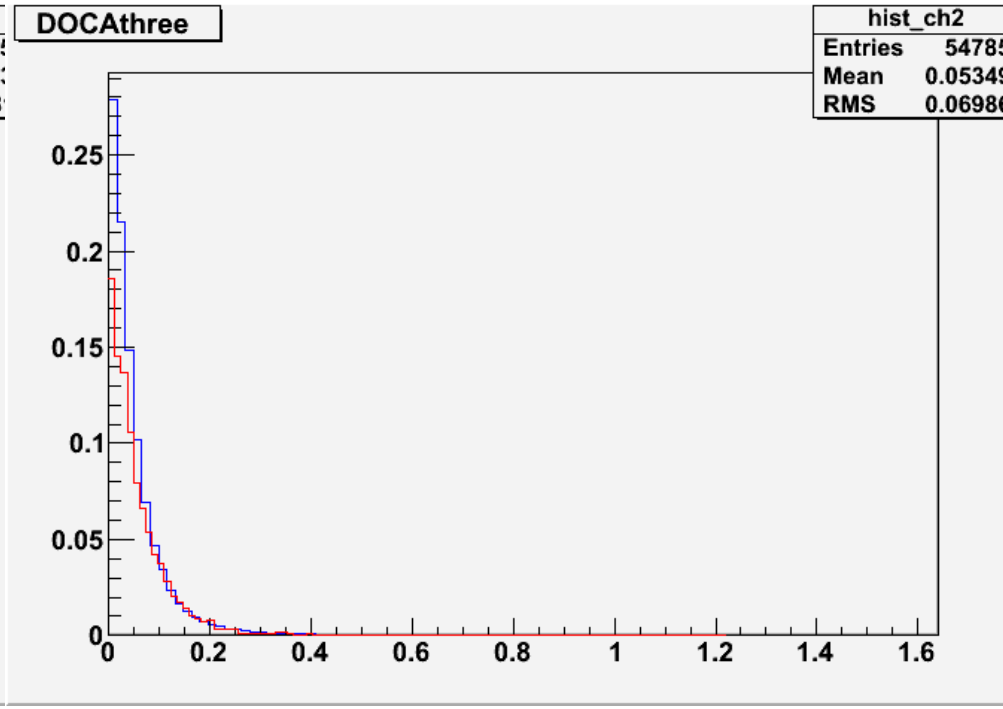
But:


p0_IP
hist_ch2
Entries 5478
Mean 0.421
RMS 0.388
0.3
0.25
0.2
0.15
0.1
0.05
0
0
2
4
6
8
10
12

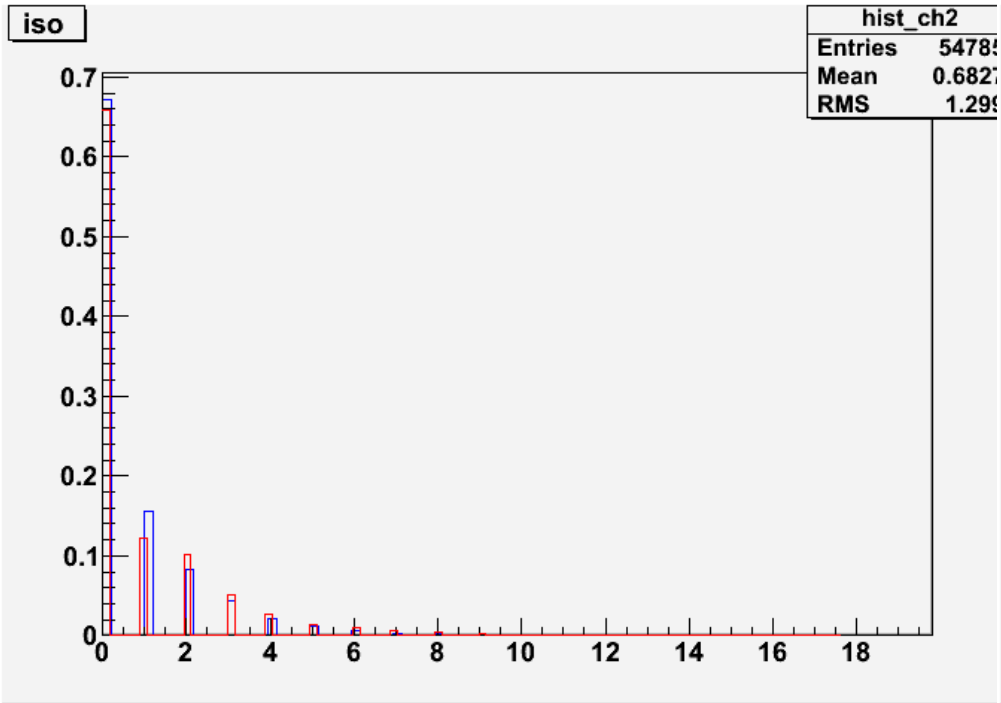

DOCAtwo
hist_ch2
Entries 5478
Mean 0.0476
RMS 0.0556
0.25
0.2
0.15
0.1
0.05
0
0
0.2
0.4
0.6
0.8
1
1.2
1.4

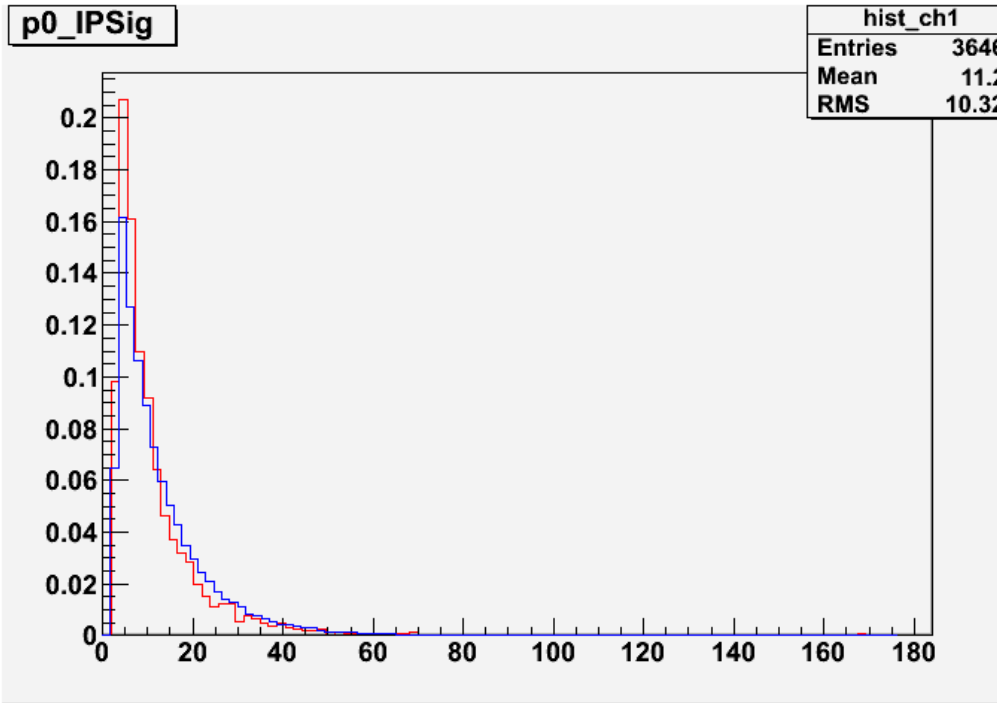
But:


TMath::Exp(-1000*LifeTime)
hist_ch2
Entries 5478
Mean 0.377
RMS 0.18
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8

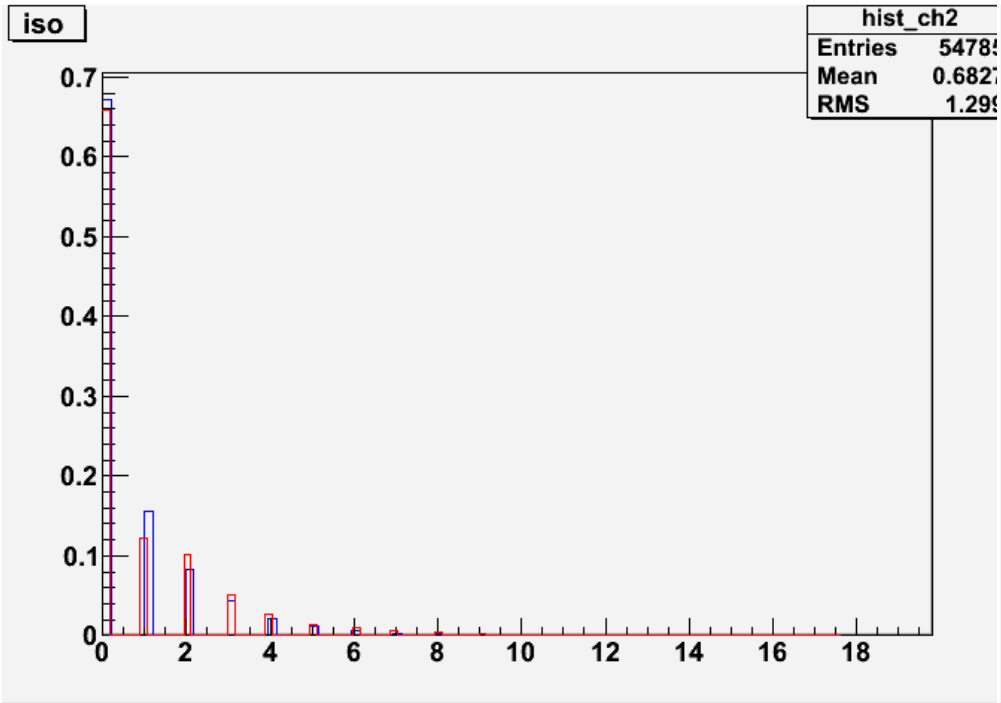

DOCAthree
hist_ch2
Entries 5478
Mean 0.0534
RMS 0.0698
0.25
0.2
0.15
0.1
0.05
0
0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6

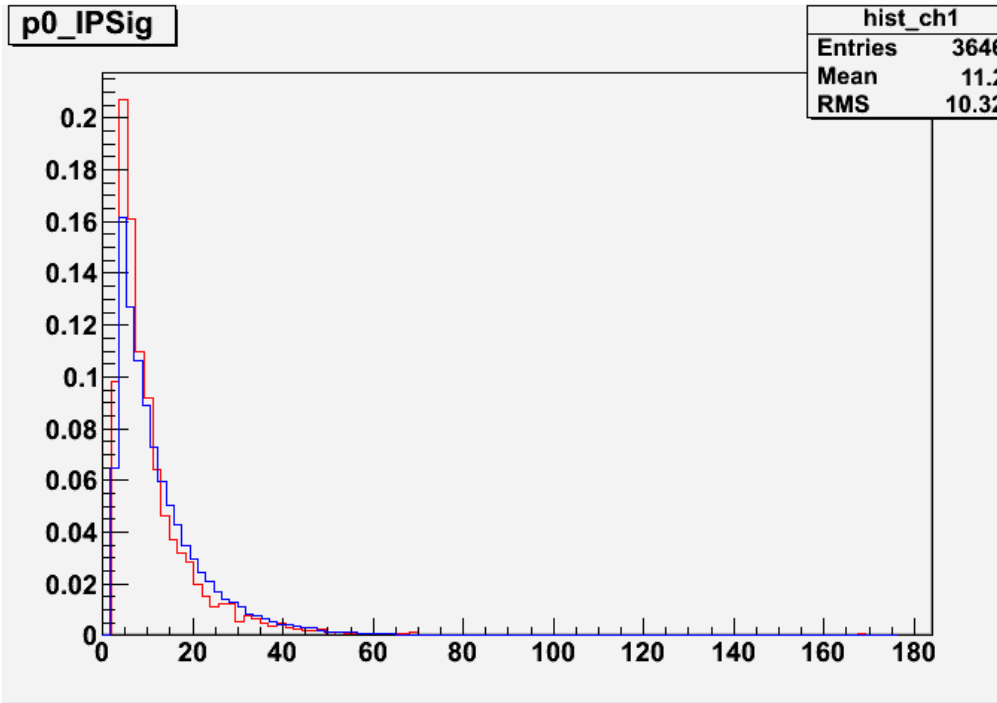
But:


iso
hist_ch2
Entries 5478
Mean 0.682
RMS 1.29
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 2 4 6 8 10 12 14 16 18

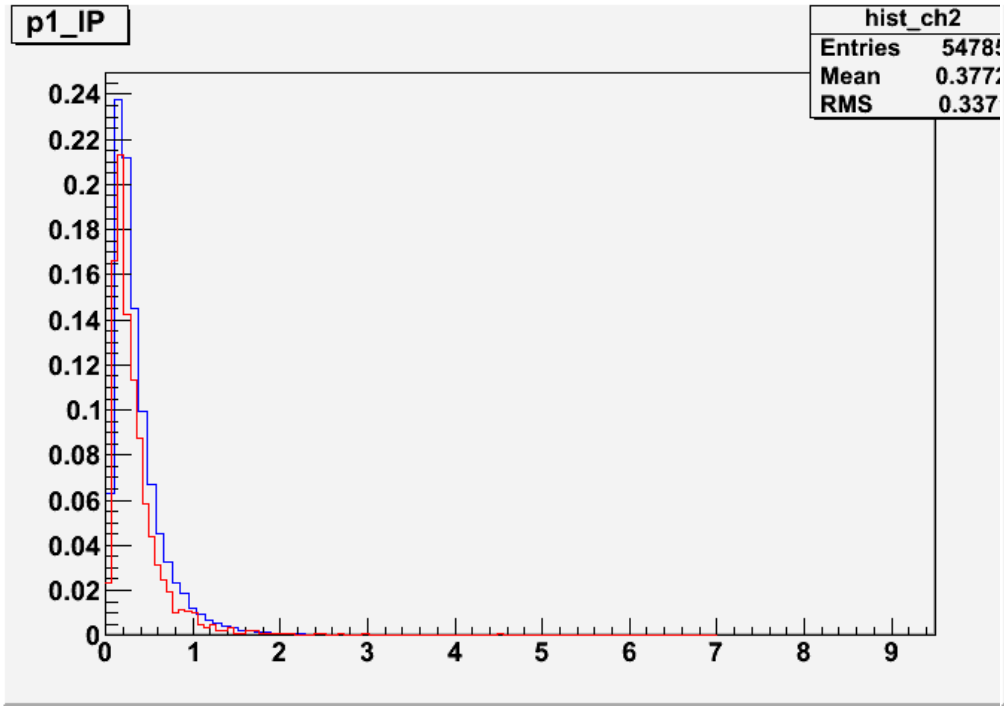

p0_IPSig
hist_ch1
Entries 364
Mean 11.
RMS 10.3
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 20 40 60 80 100 120 140 160 180

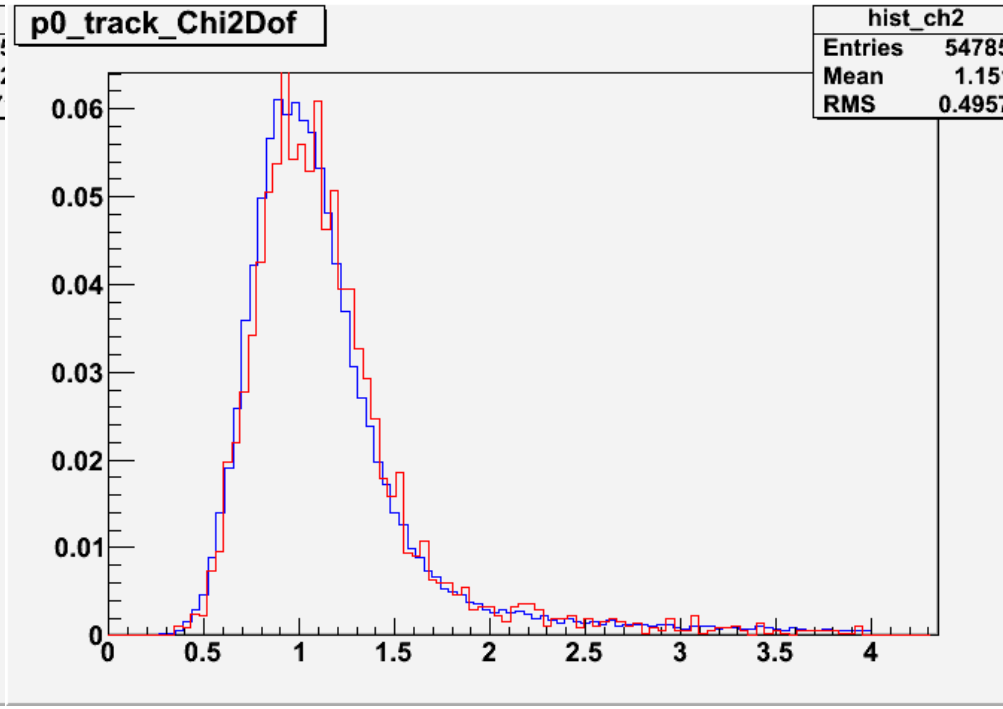
But:


iso
hist_ch2
Entries 5478
Mean 0.682
RMS 1.29
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 2 4 6 8 10 12 14 16 18

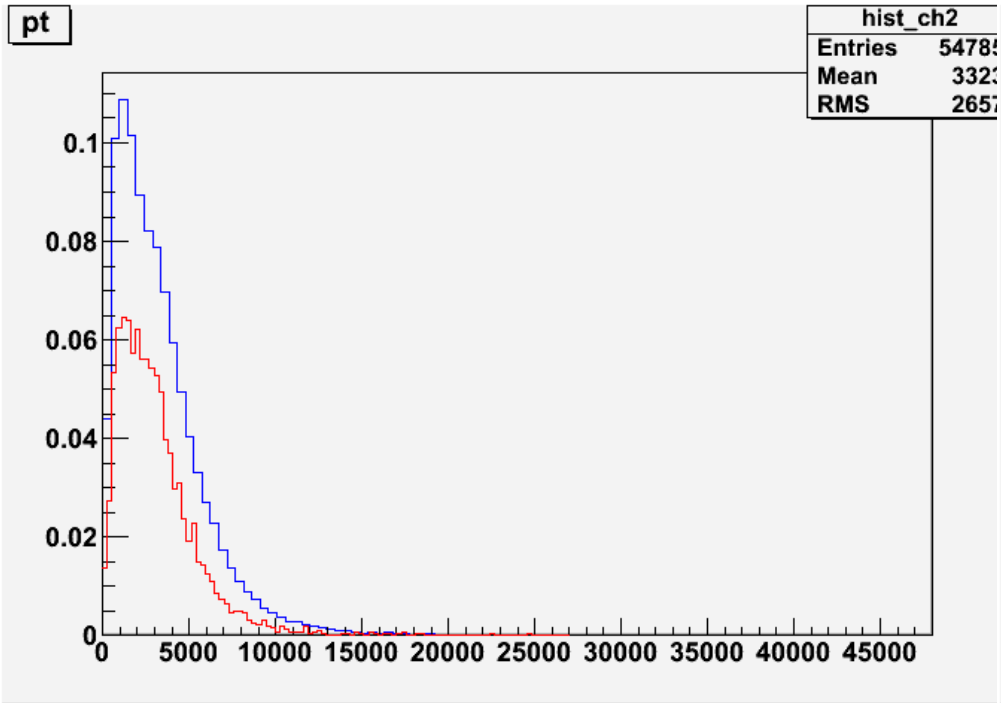

p0_IPSig
hist_ch1
Entries 364
Mean 11.
RMS 10.3
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 20 40 60 80 100 120 140 160 180

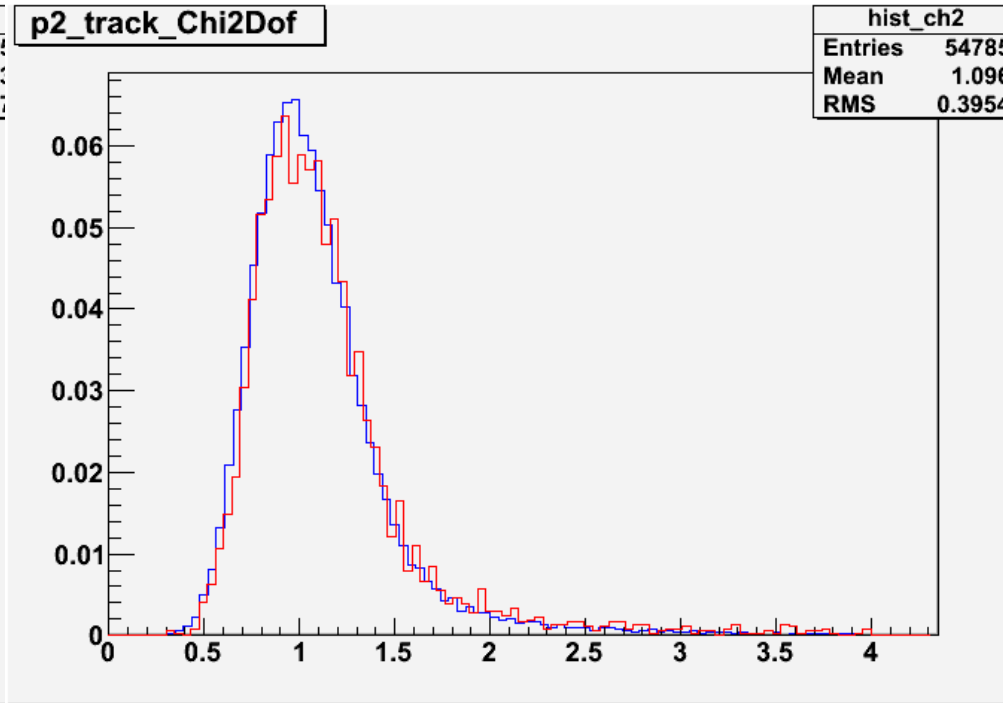
But:


p1_IP
hist_ch2
Entries 5478
Mean 0.377
RMS 0.337
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
0 1 2 3 4 5 6 7 8 9

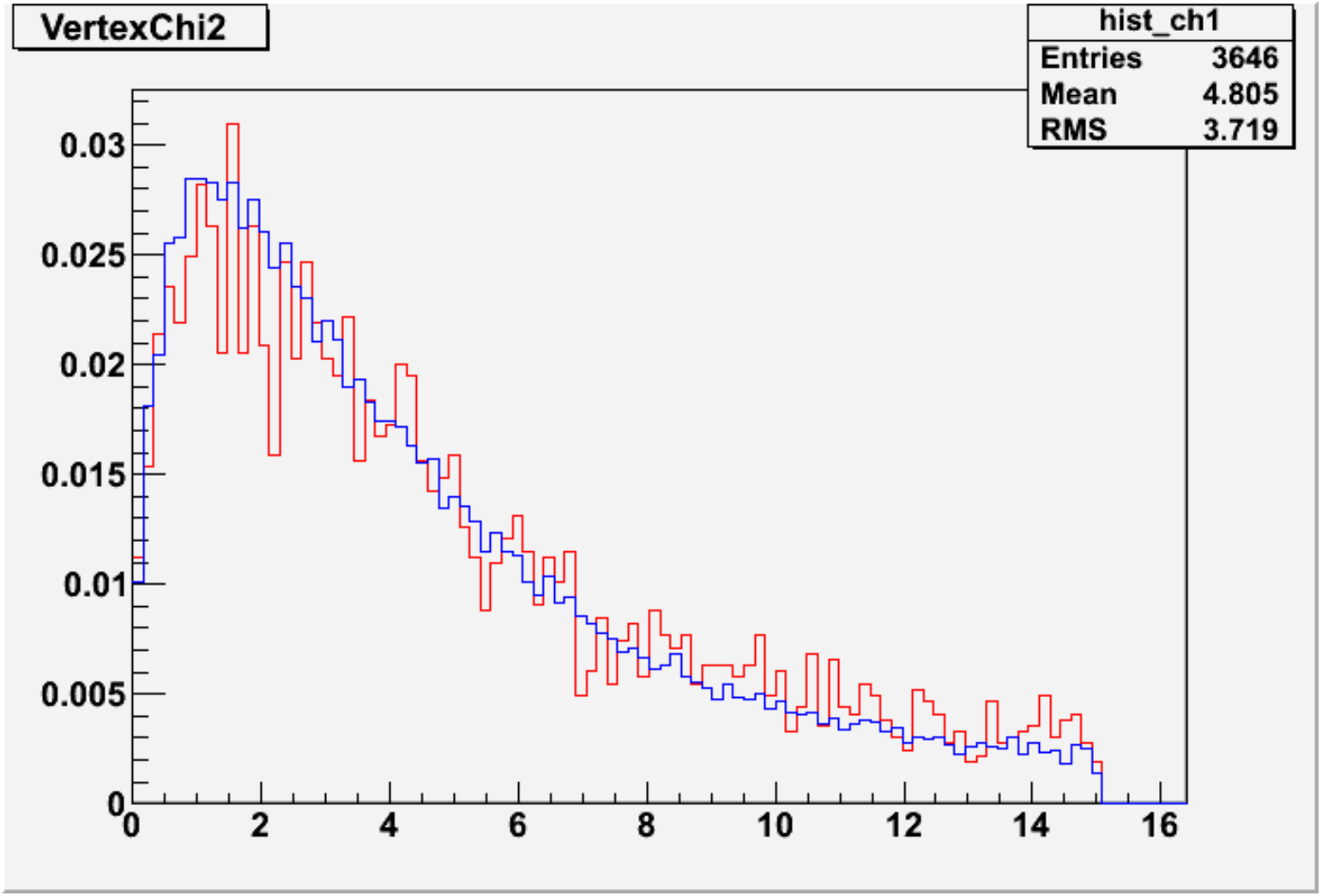

p0_track_Chi2Dof
hist_ch2
Entries 5478
Mean 1.15
RMS 0.495
0.06
0.05
0.04
0.03
0.02
0.01
0
0 0.5 1 1.5 2 2.5 3 3.5 4

But:


pt
hist_ch2
Entries 5478
Mean 332
RMS 265
0.1
0.08
0.06
0.04
0.02
0
0 5000 10000 15000 20000 25000 30000 35000 40000 45000


p2_track_Chi2Dof
hist_ch2
Entries 5478
Mean 1.09
RMS 0.395
0.06
0.05
0.04
0.03
0.02
0.01
0
0 0.5 1 1.5 2 2.5 3 3.5 4

But:

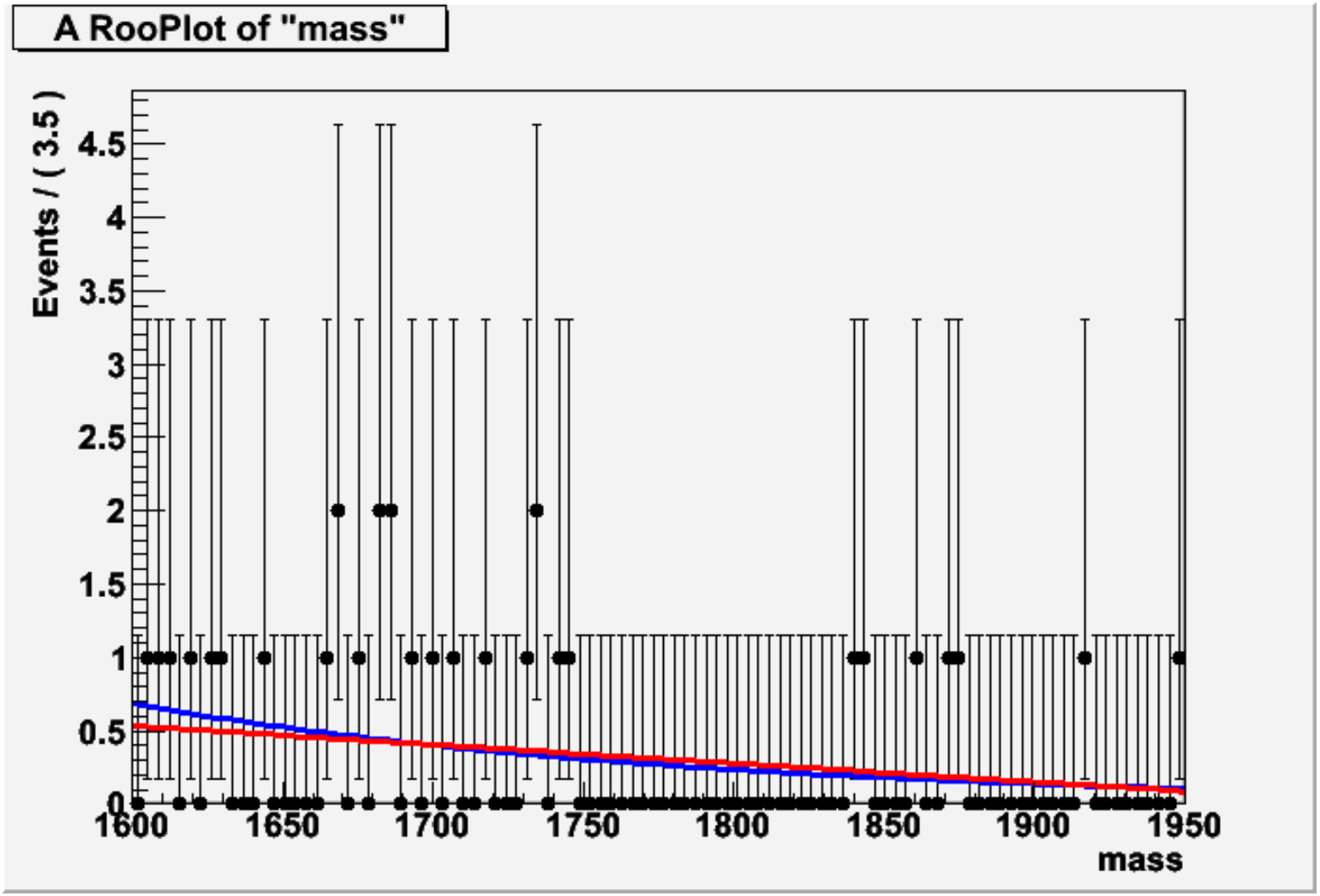

VertexChi2
hist_ch1
Entries 3646
Mean 4.805
RMS 3.719
0.03
0.025
0.02
0.015
0.01
0.005
0
0
2
4
6
8
10
12
14
16

Grep then while they are hot!

add here

THE FIT

If I also don't cut of the window i get the same ae Georg.

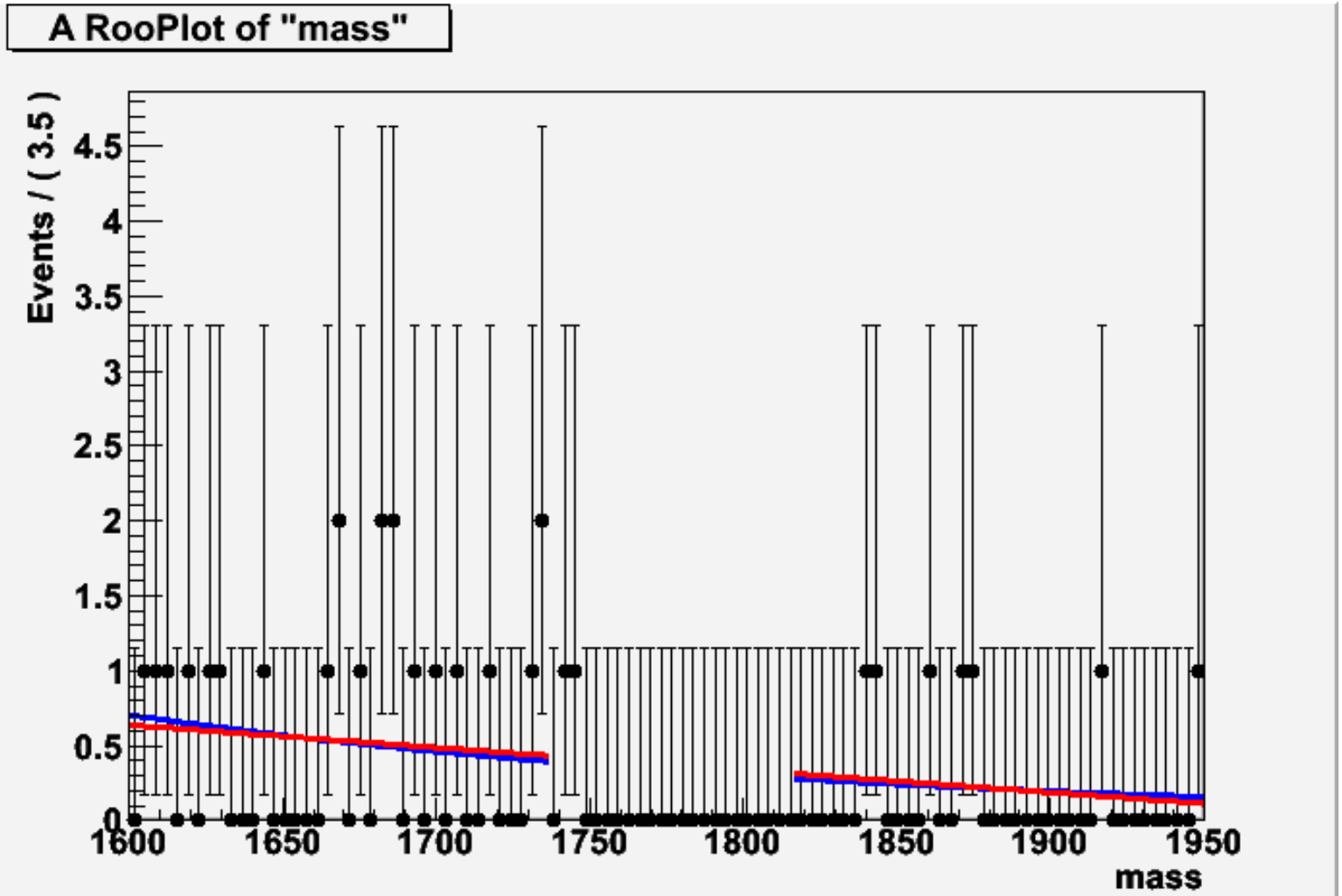


THE FIT

Last evening together with Paul we had a look at the code. In the official RooFit tutorial/examples they do the same. I send code arround if some one wants to check themself.

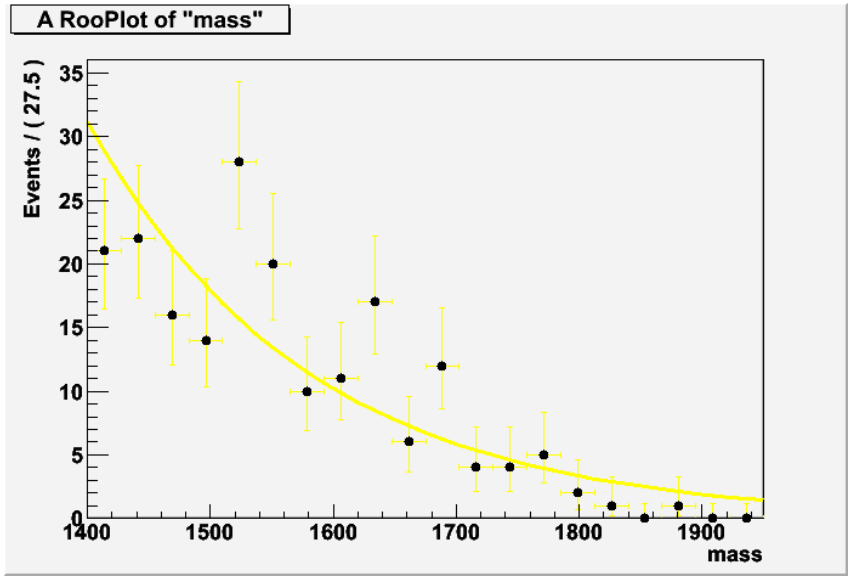
Parameteric extended likelihood term in the PDF

I reallized something. Fits are done using fixed number of points(no account for statiscital fluctuations). This has no affect in high stat plots. But for the low stat. we get what we want:

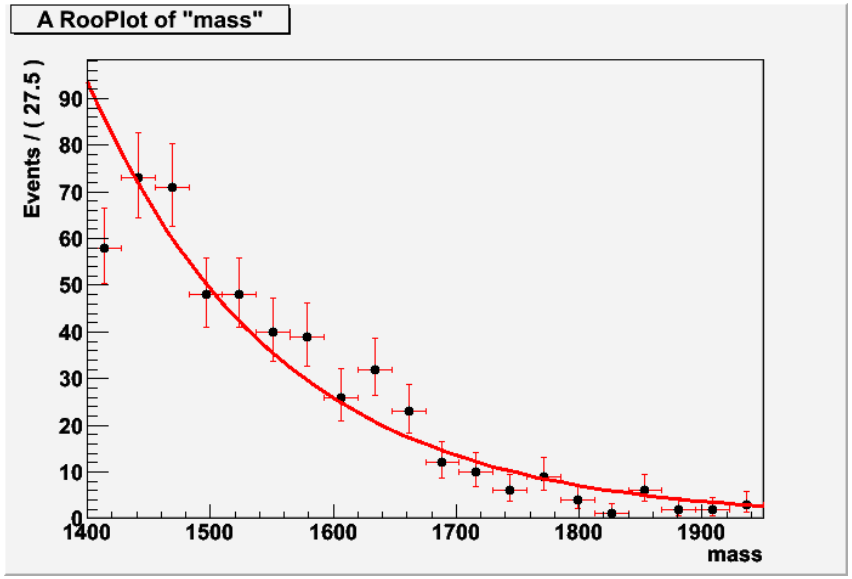


FITS

NEW DATA ARRIVED =) Plots nade form 2.3M events. On disk 3.5M availe(working to get ntuples).

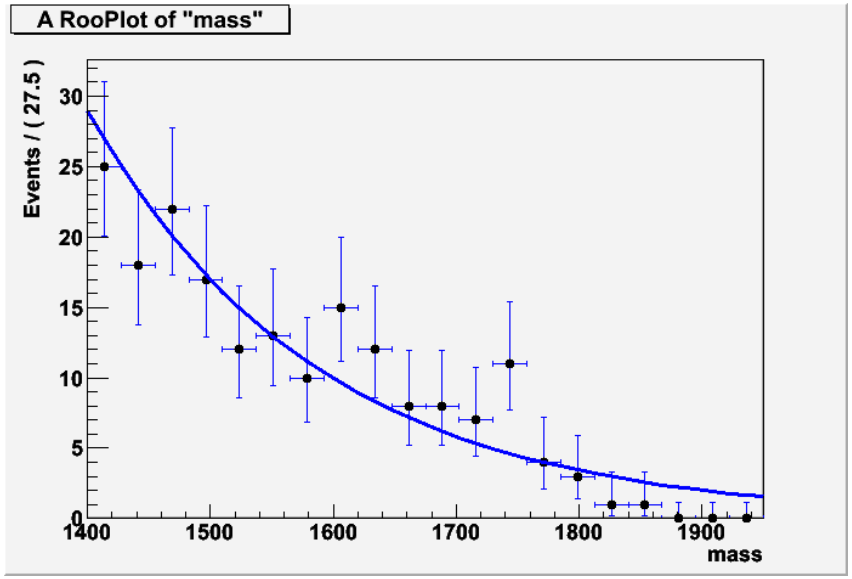


$Pid \in (0.03, 1),\ Geo \in (0.44, 1)$

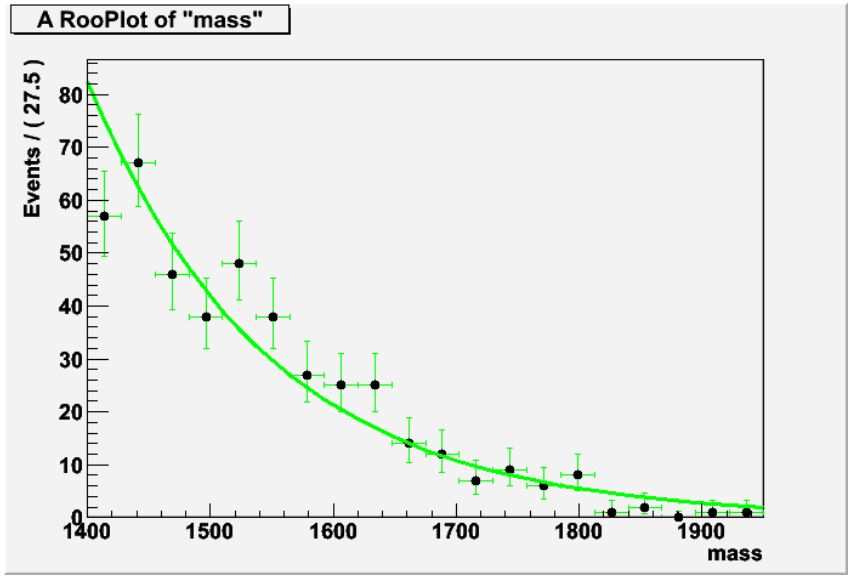


$Pid \in (0.03, 1),\ Geo \in (-1.0, 0.44)$

FITS

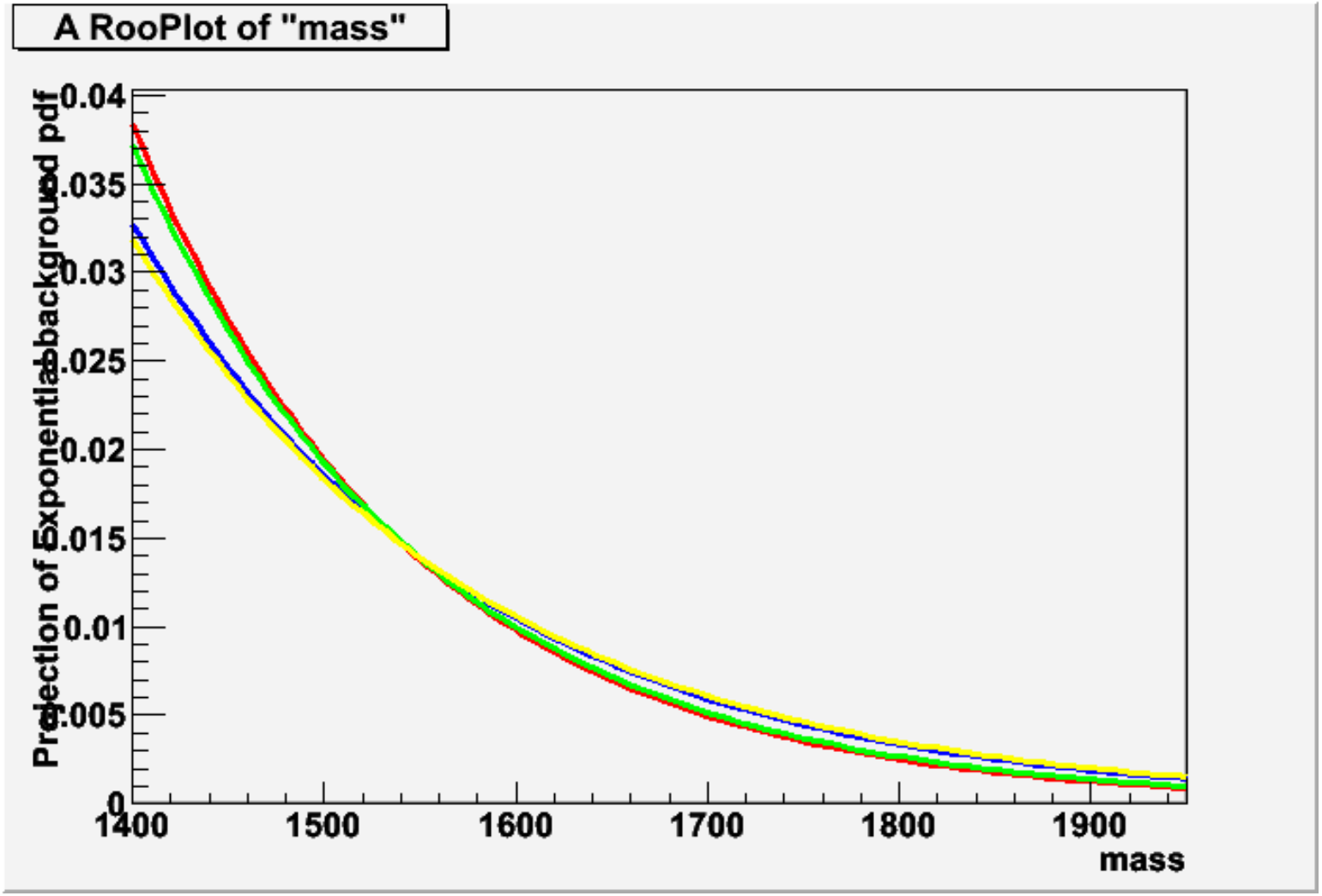


$Pid \in (-0.03, 0.03),\ Geo \in (0.44, 1)$



$Pid \in (-0.03, 0.03)$,
$Geo \in (-1.0, 0.44)$

THE FIT


A RooPlot of "mass"
Projection of Exponentiab background pdf
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1400
1500
1600
1700
1800
1900
mass

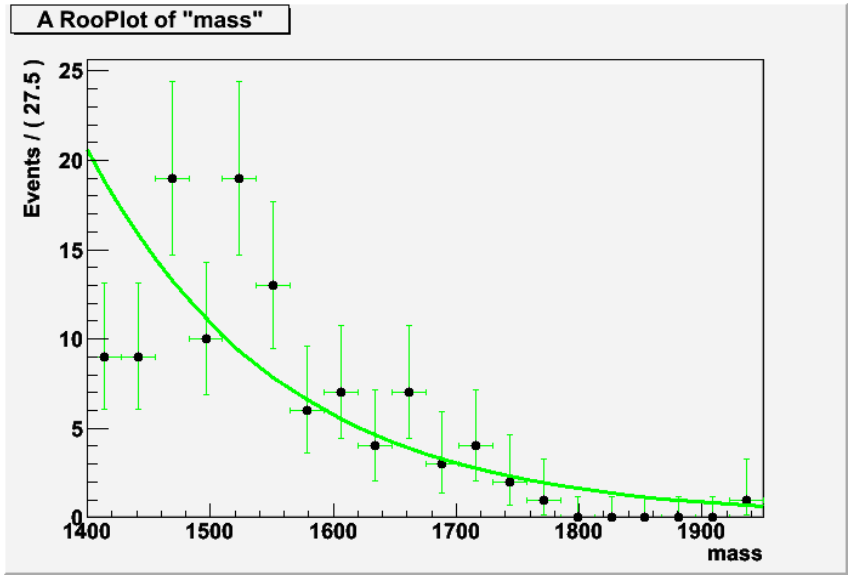
Old values

PID	Geo
−0.03	−1.0
−0.005	0.116
0.03	0.44
0.07	0.616
1	1.0

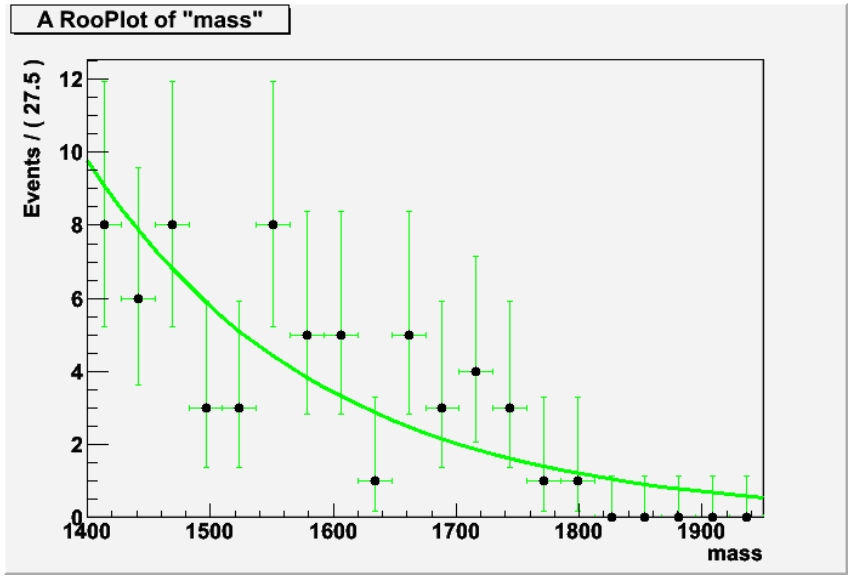
All exp, unbinned max lik. fit.(data ploted binned for easy comparison)

Exponential Linear

FITS

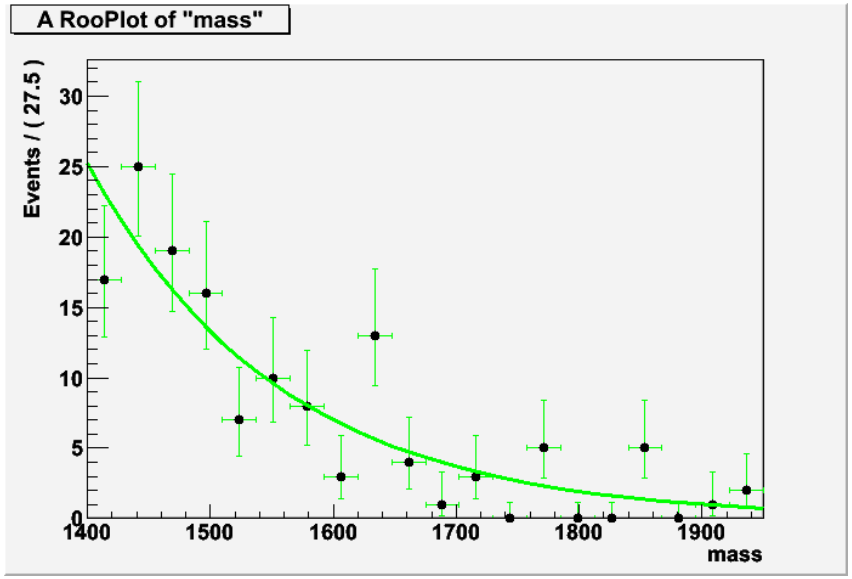


$Pid \in (0.005, 0.03)$,
$Geo \in (0.116, 0.44)$

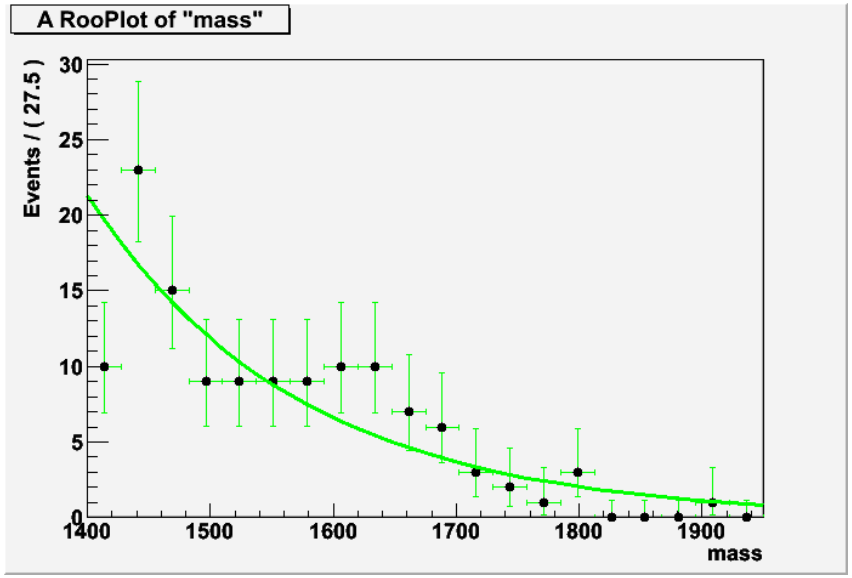


$Pid \in (0.005, 0.03)$,
$Geo \in (0.44, 0.616)$

FITS

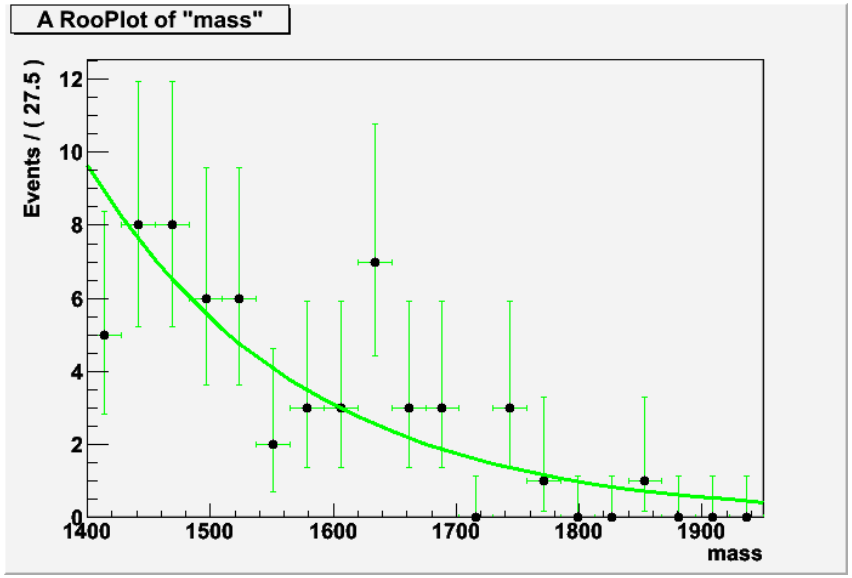


$Pid \in (0.005, 0.03),\ Geo \in (-1, 0.116)$

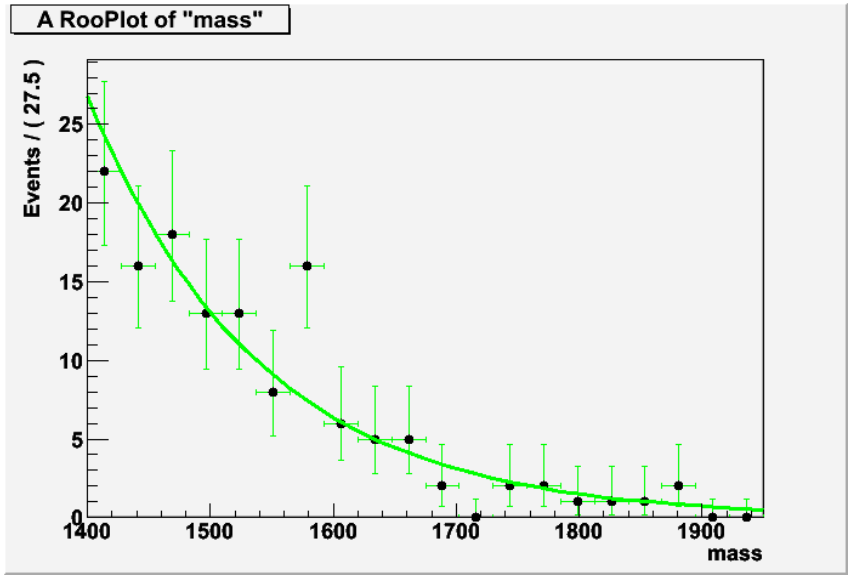


$Pid \in (-0.03, -0.005),$
$Geo \in (0.116, 0.44)$

FITS

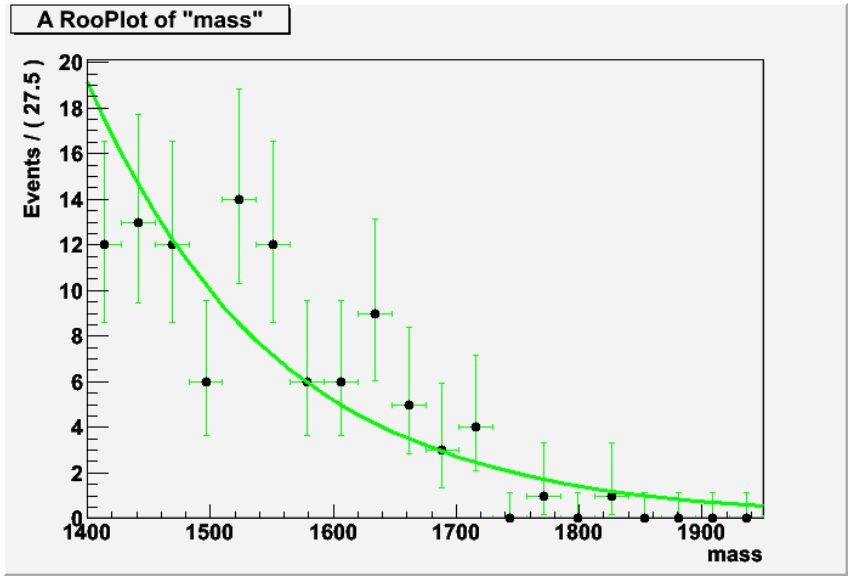


$Pid \in (-0.03, -0.005)$,
$Geo \in (0.44, 0.616)$

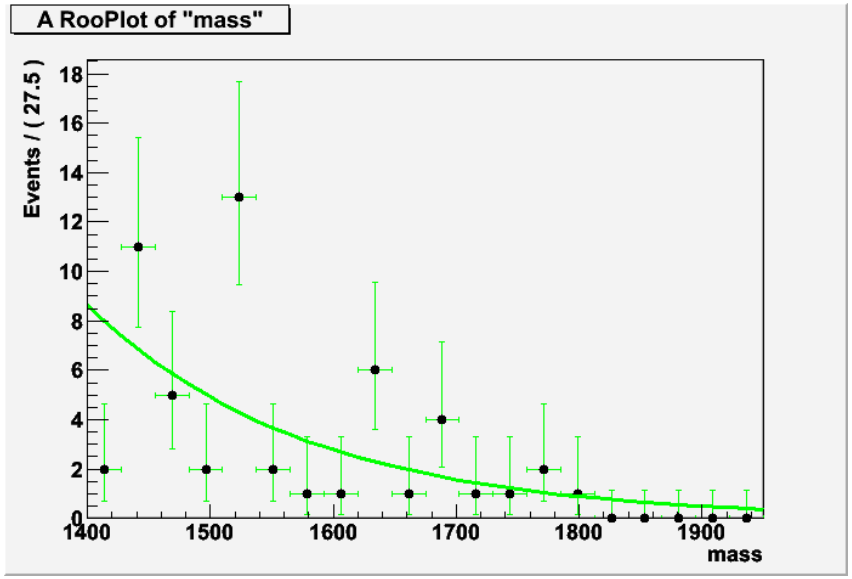


$Pid \in (-0.03, -0.005)$,
$Geo \in (-1, 0.116)$

FITS

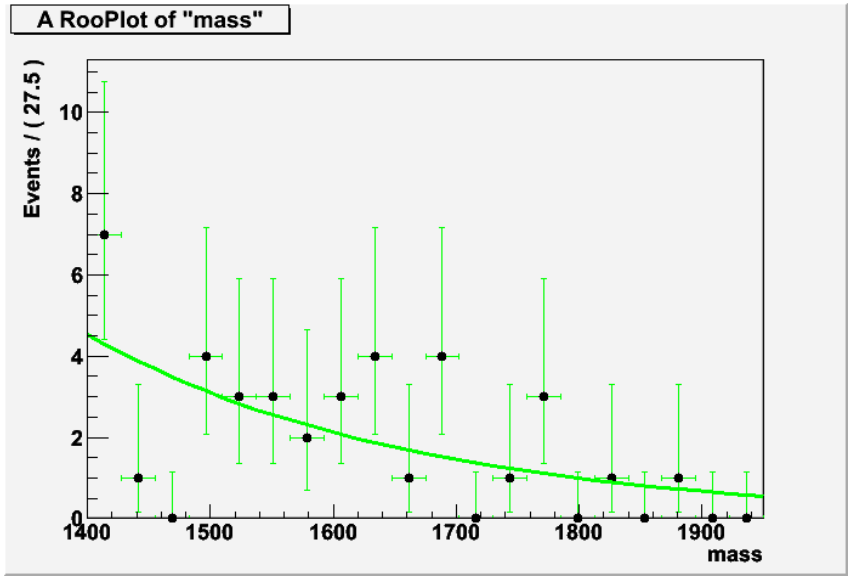


$Pid \in (0.03, 0.07),\ Geo \in (0.116, 0.44)$

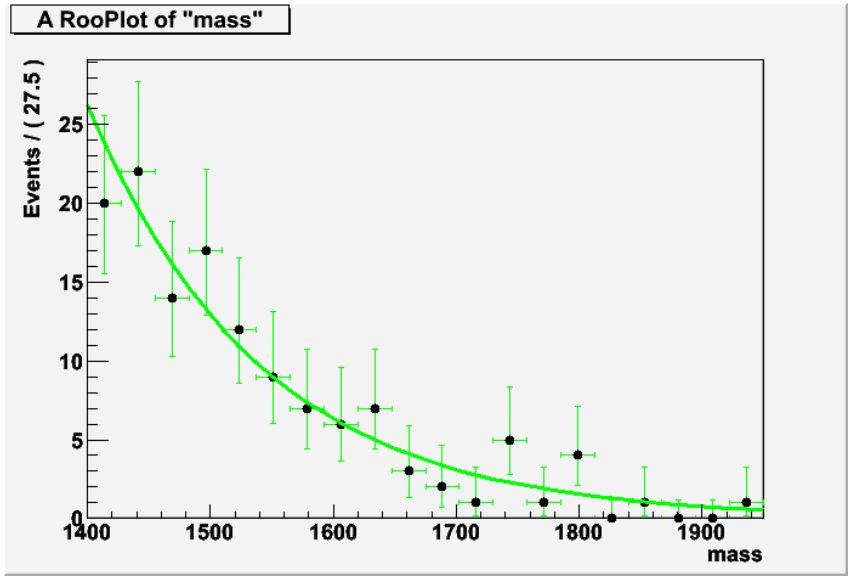


$Pid \in (0.03, 0.07),\ Geo \in (0.44, 0.616)$

FITS

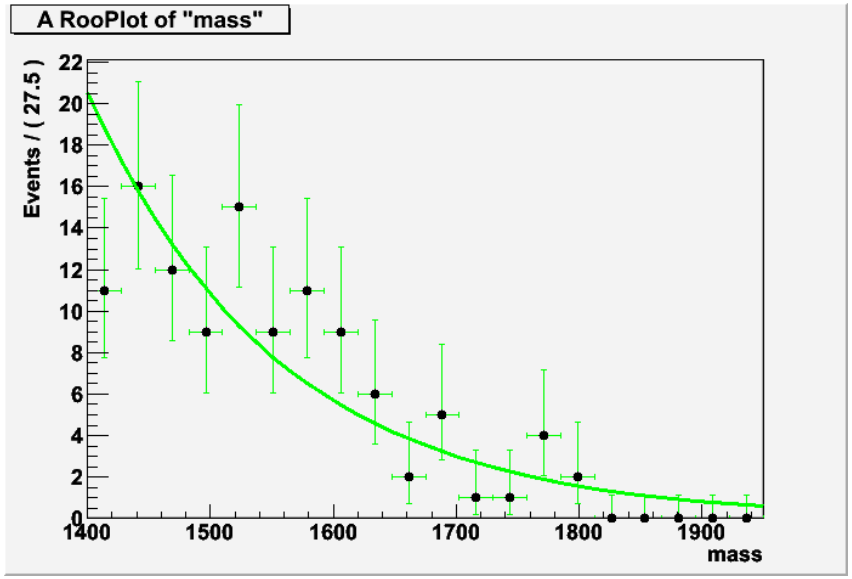


$Pid \in (0.03, 0.07),\ Geo \in (0.616, 1)$

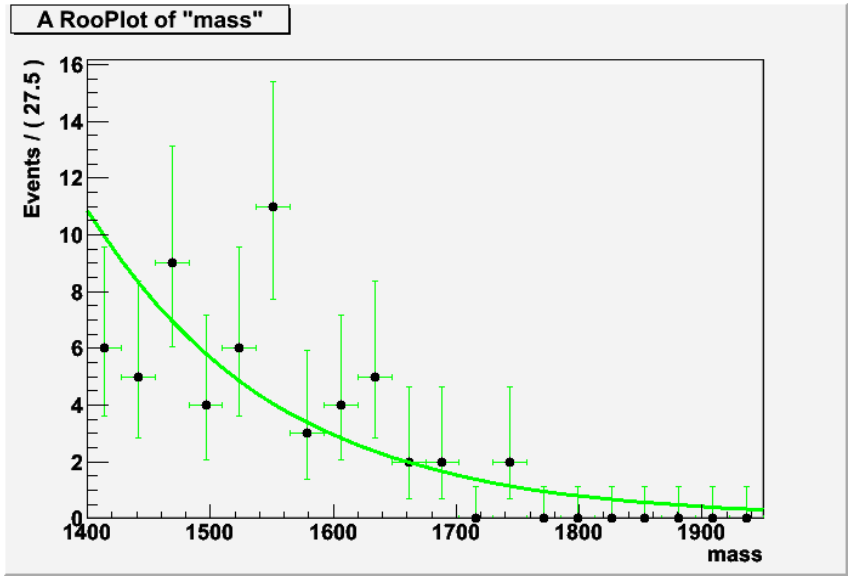


$Pid \in (0.03, 0.07),\ Geo \in (-1, 0.116)$

FITS

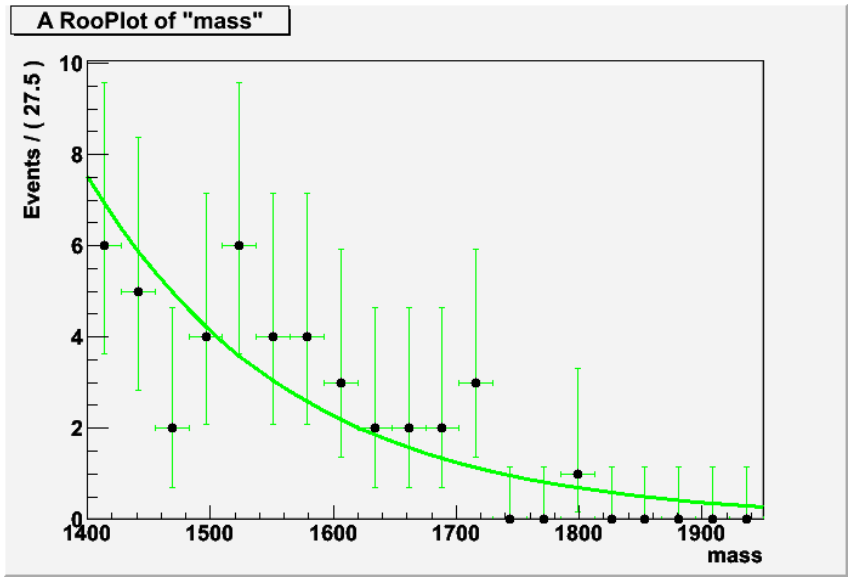


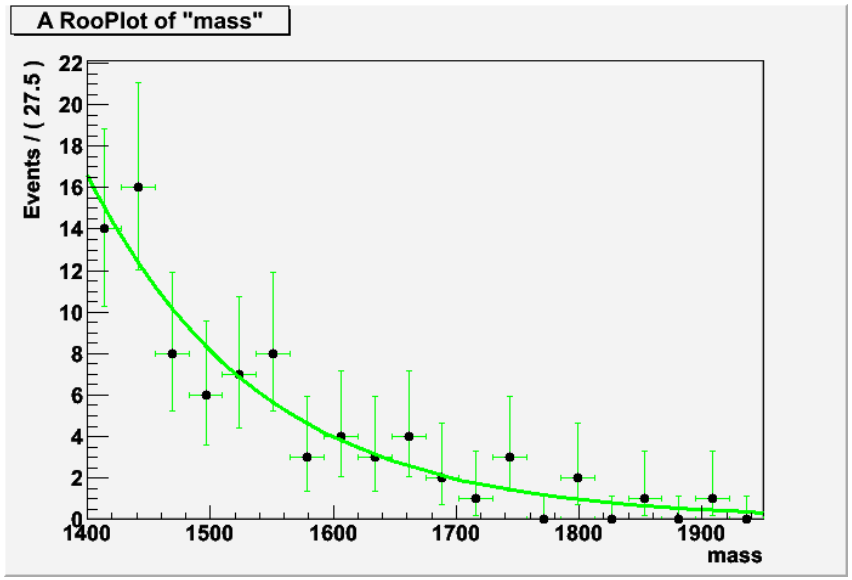
$Pid \in (0.07, 1),\ Geo \in (0.116, 0.44)$



$Pid \in (0.07, 1),\ Geo \in (0.44, 0.616)$

FITS


A RooPlot of "mass"
Events / (27.5)
mass
0
2
4
6
8
10
1400
1500
1600
1700
1800
1900


A RooPlot of "mass"
Events / (27.5)
mass
0
2
4
6
8
10
12
14
16
18
20
22
1400
1500
1600
1700
1800
1900