VBF H->bb
Hbb->tautaubb

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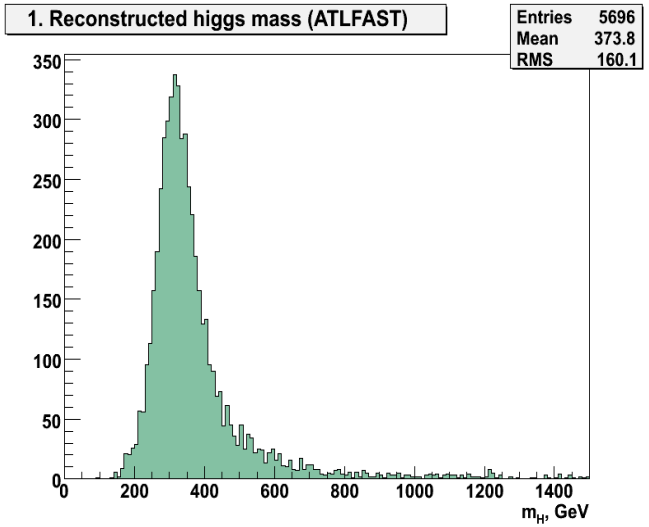
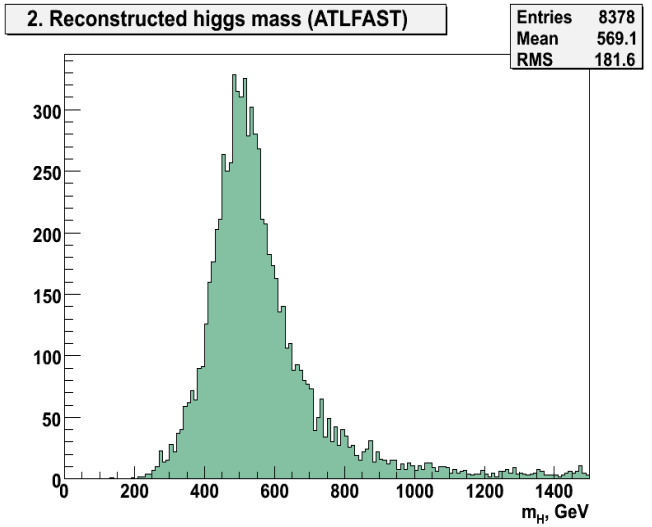
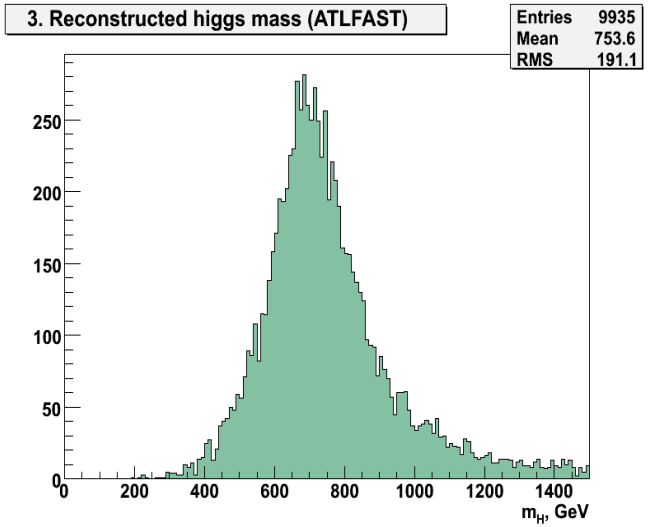
Collinear: require deltaPHI<2.5



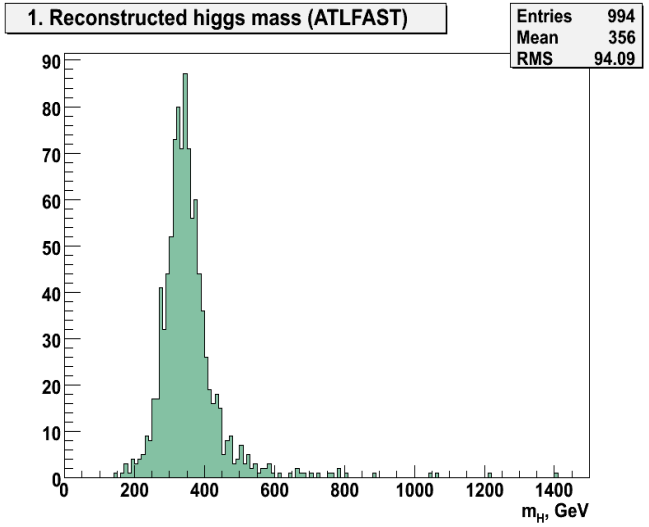
Overflow: 300/6k



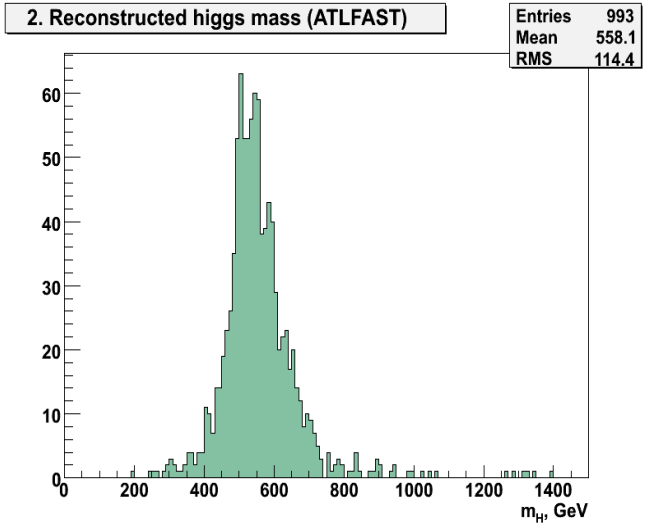
Overflow: 720/8k



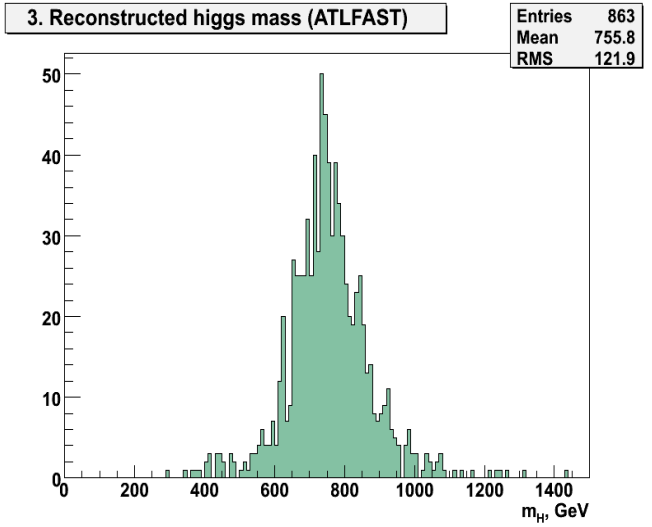
Overflow: 1200/10k



Overflow: 4/1k



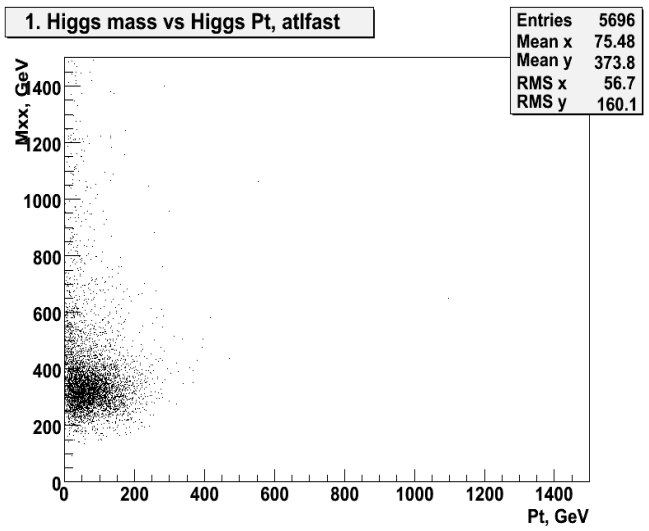
Overflow: 4/1k



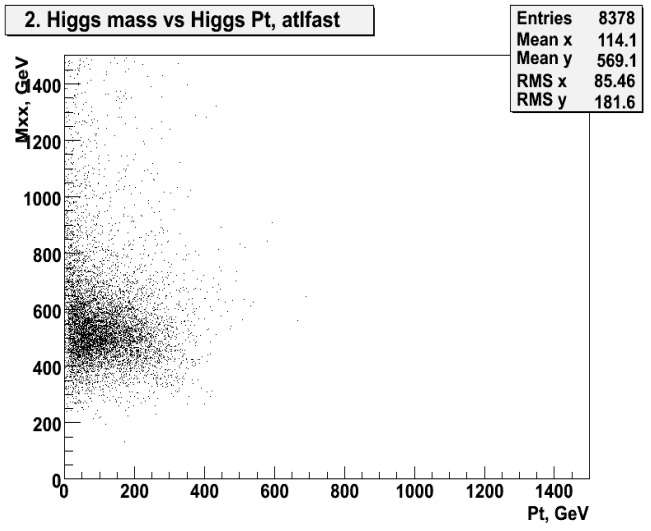
Overflow: 6/1k

Means are still shifted to the right!

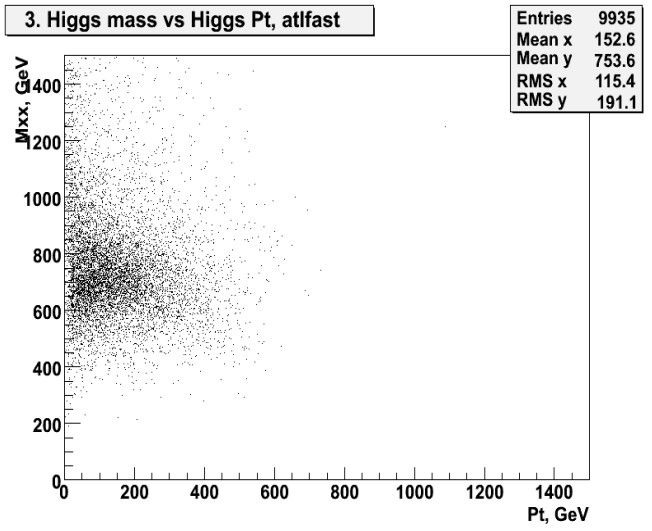
Collinear: require deltaPHI<2.5



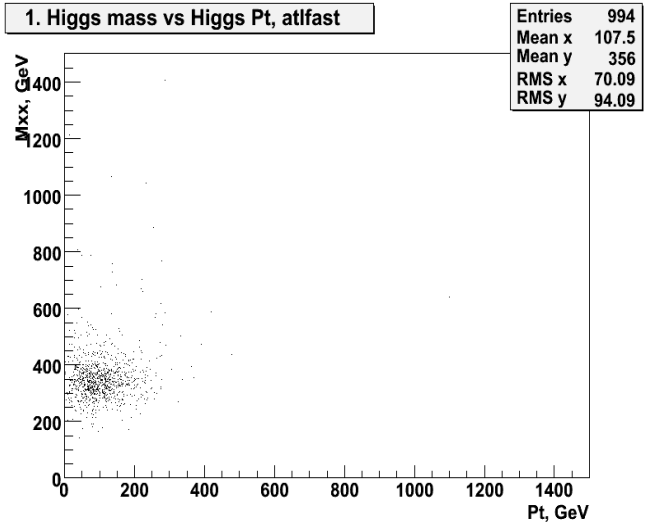
Overflow: 300/6k



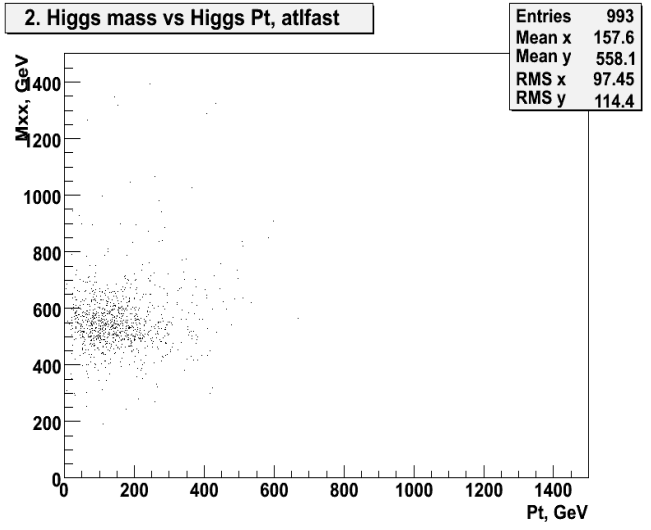
Overflow: 720/8k



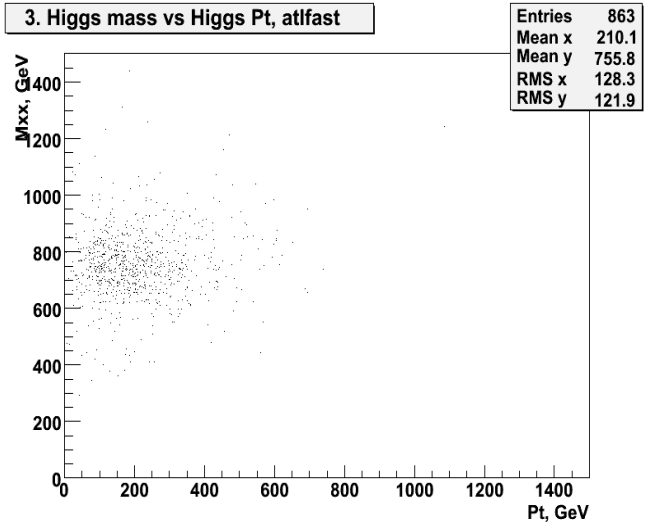
Overflow: 1200/10k



Overflow: 4/1k



Overflow: 4/1k



Overflow: 6/1k

Means are still shifted to the right!

sherpanouenew_fix samples

Hard to get enough statistics: the default selection cuts kill a lot of data.

Default selection cuts:

* total jets > 4
* b-jets = 2
* deltaEta between forward jets < 0

Results:

234_50

no trig: 252/100k
4j50 : 0.01/100k
4j40 : 0.2/100k - hopeless

34_10

no trig: 6/88k
4k40 : 1e-6/88k – totally hopeless!

34_25

no trig: 226/100k
4j40 : 3.4/100k
4j25 : 18/100k - will be hard to collect enough statistics

34_50

no trig: 766/100k
4j50 : 35/100k
4j40 : 80/100k - good to calculate significance, not enough for BG shape

Reconstructing Mbb in 1000 pseudo-experiments, part 1

Set par limits for: **A*exp{-(B+x)^2/(2*C^2)}**

A > 0

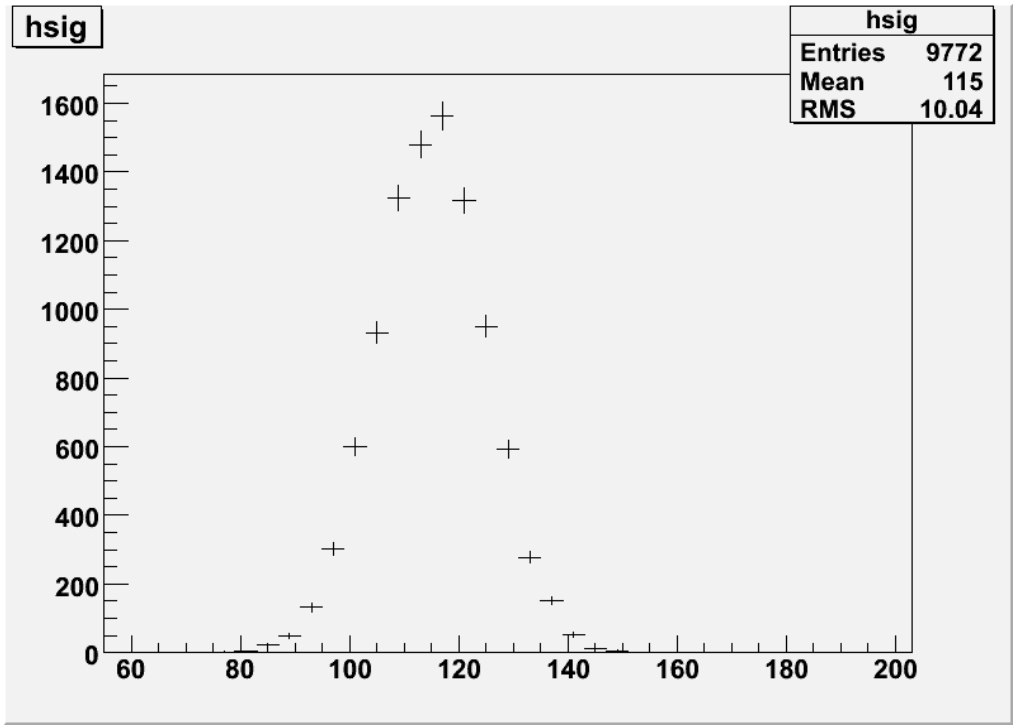
B = 100..130 (true mass peak at 115)

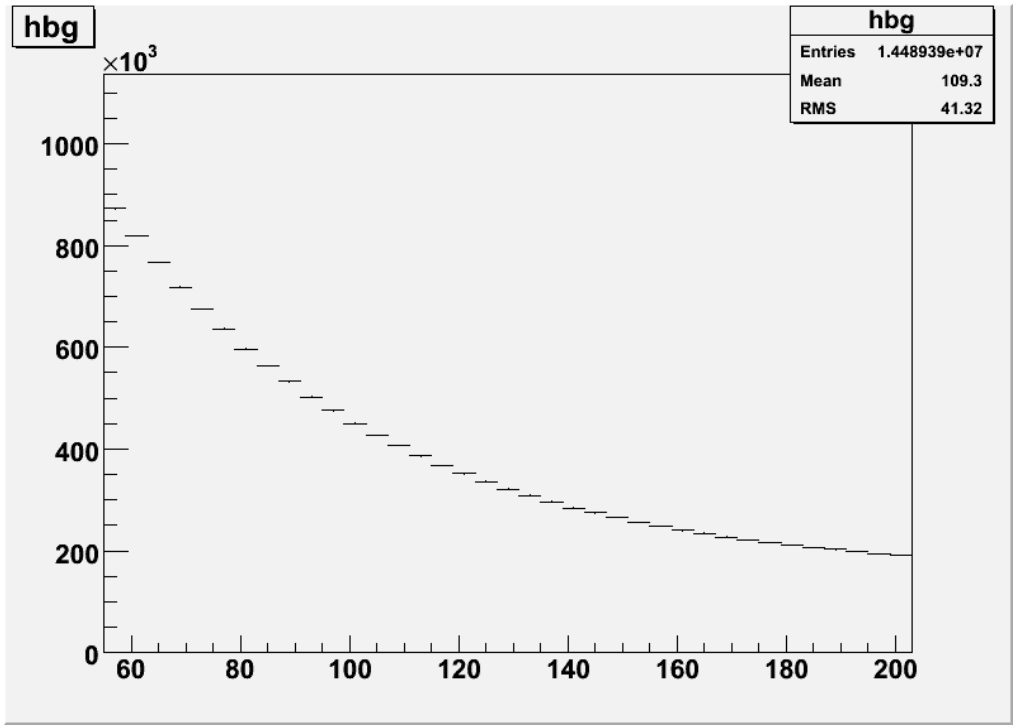
C = 5..15 (true C=10)

1st run: with expected #SIG events

2nd run: #SIG events = 0

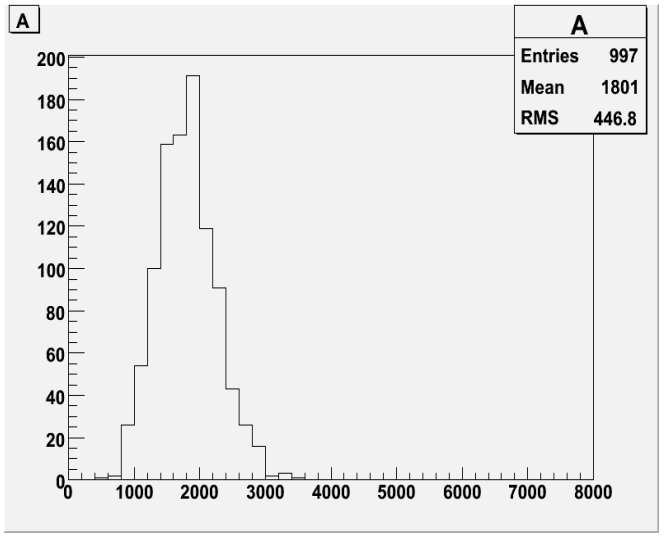
Original SIG and BG shapes:

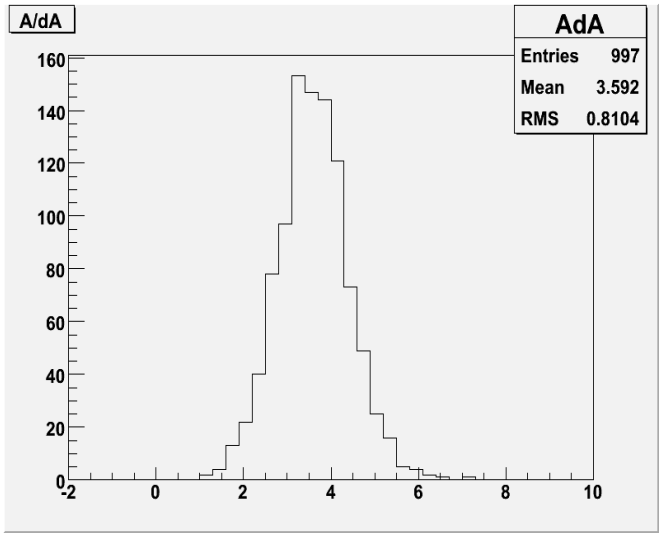


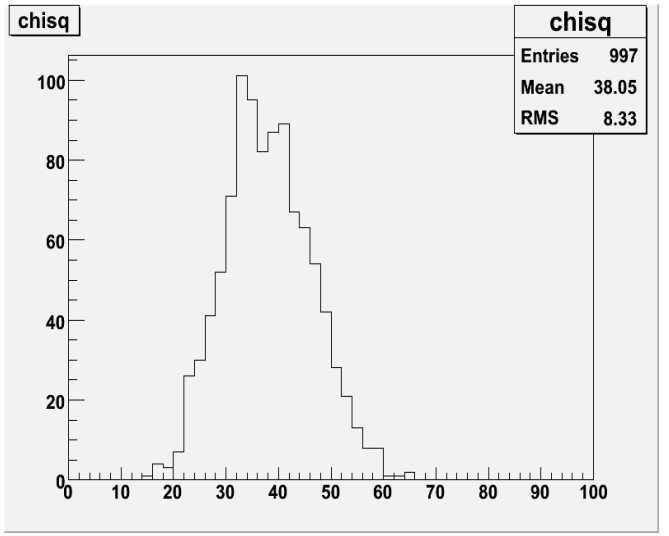


Reconstructing Mbb in 1000 pseudo-experiments, part 2

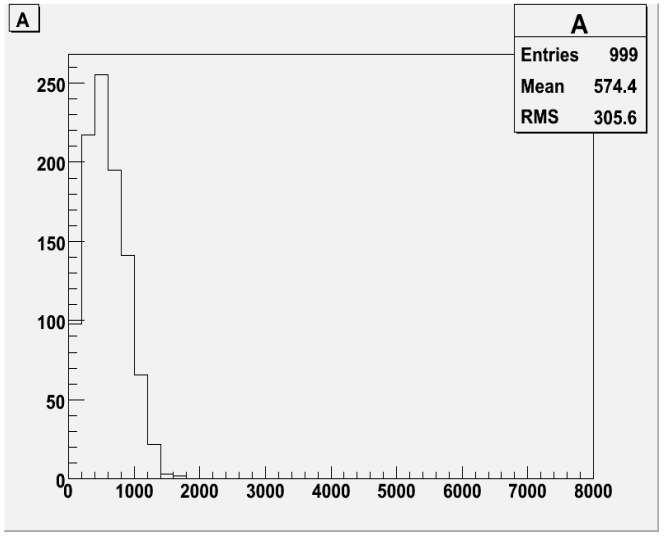
With signal present:

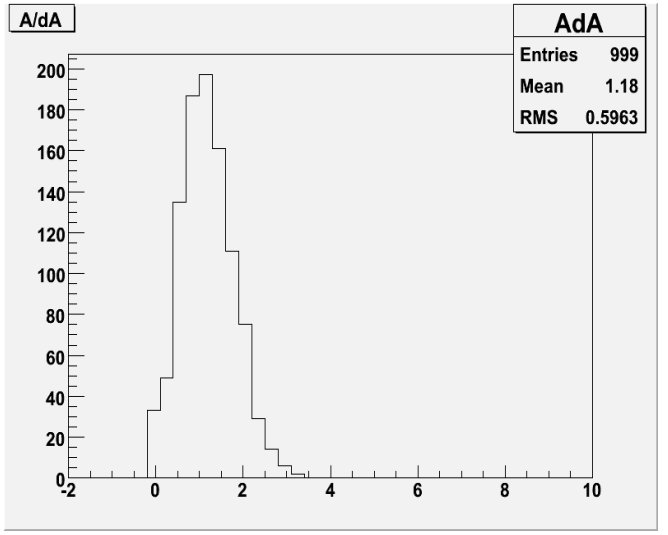


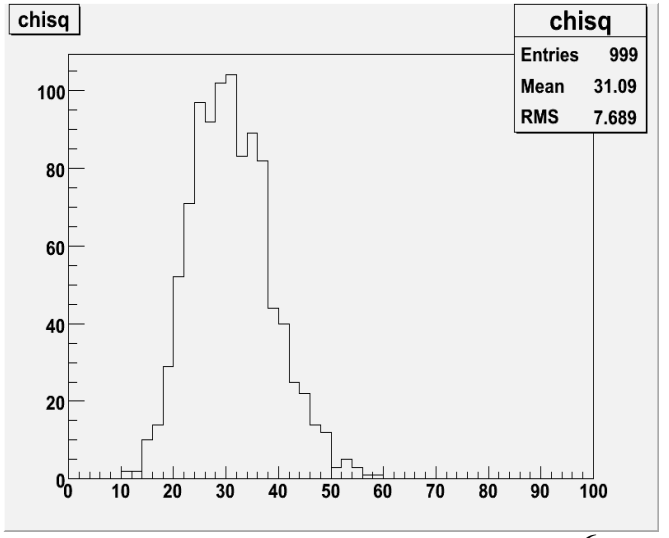




Without signal:

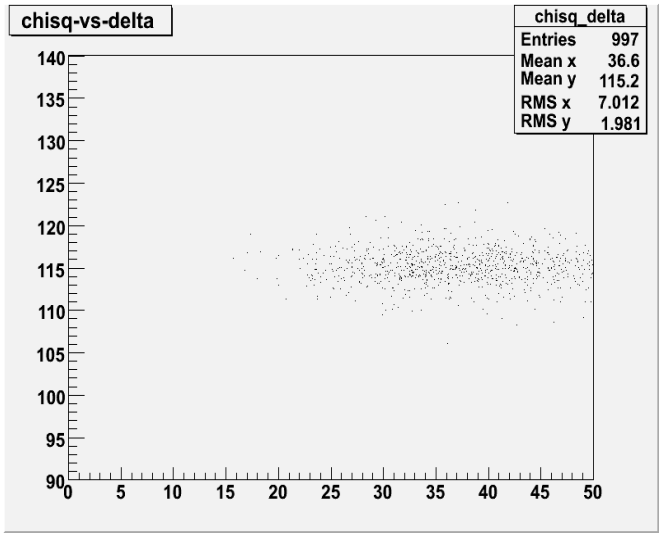


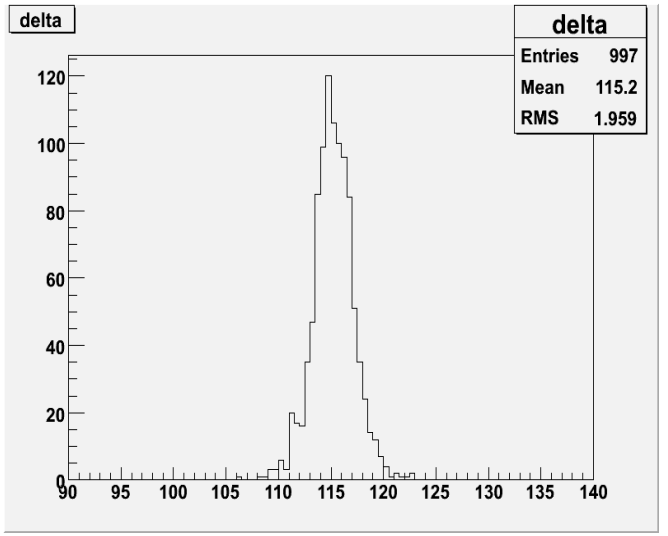


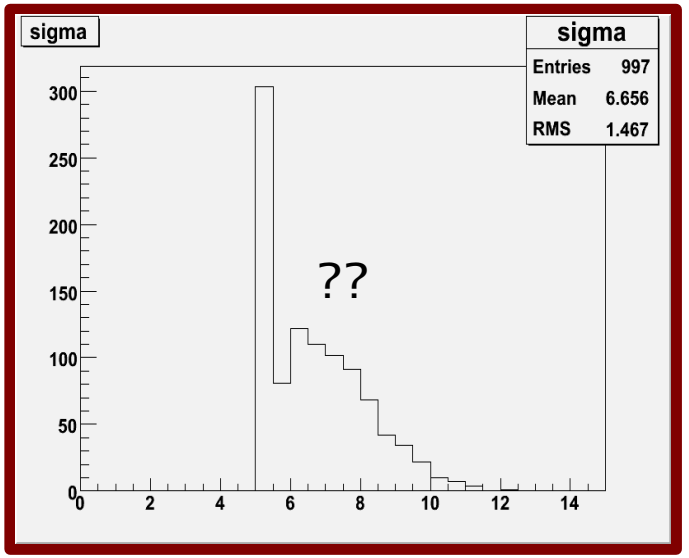


Reconstructing Mbb in 1000 pseudo-experiments, part 3

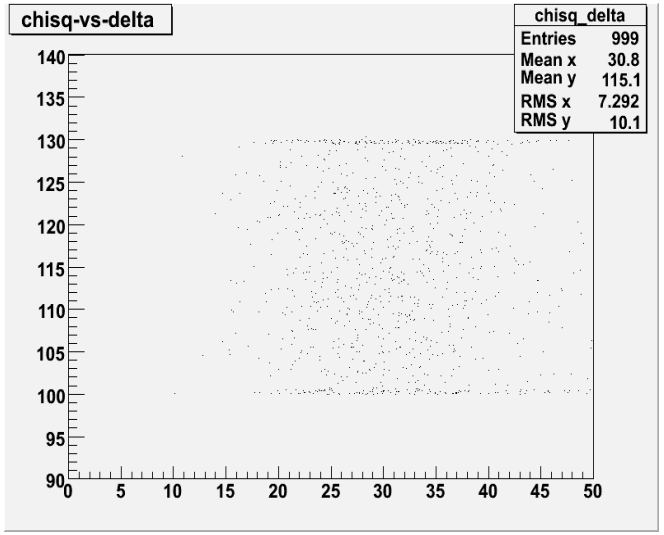
With signal present:

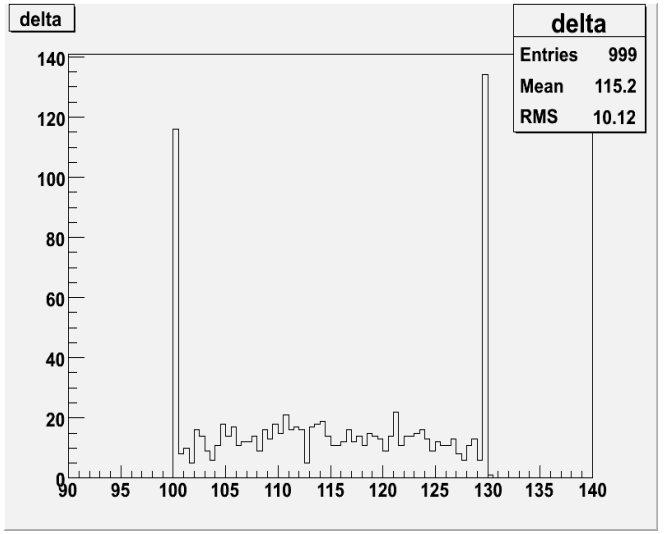


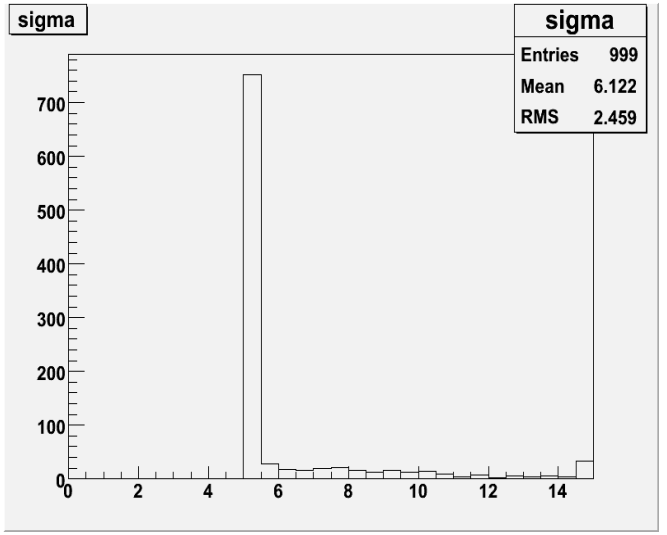




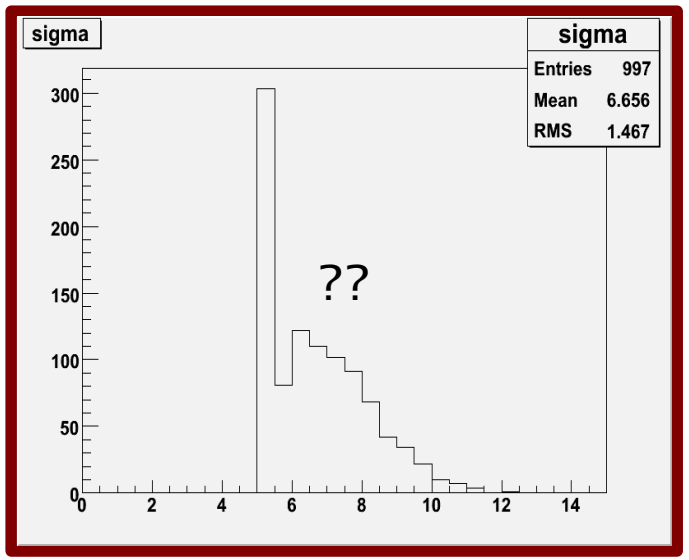
Without signal:





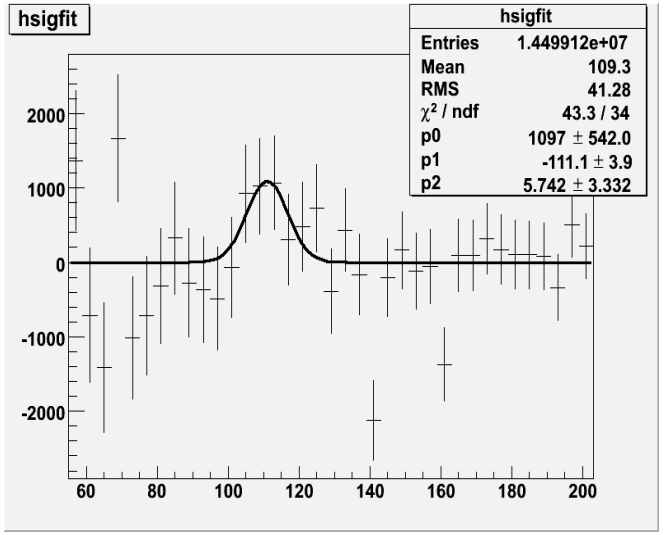


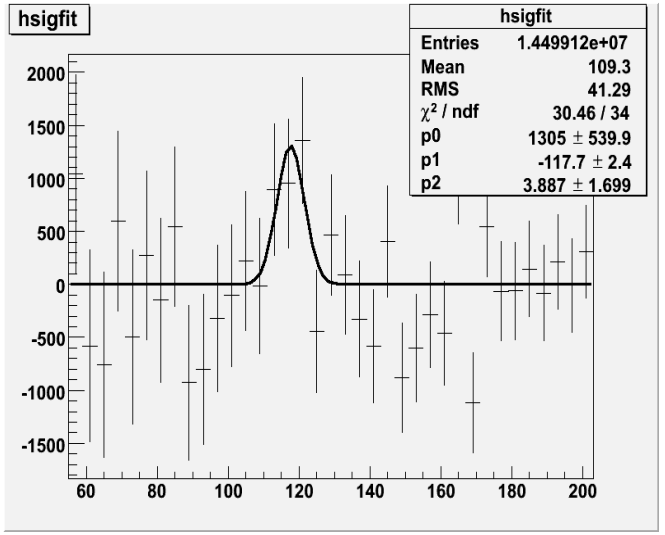
Reconstructing Mbb in 1000 pseudo-experiments, part 4

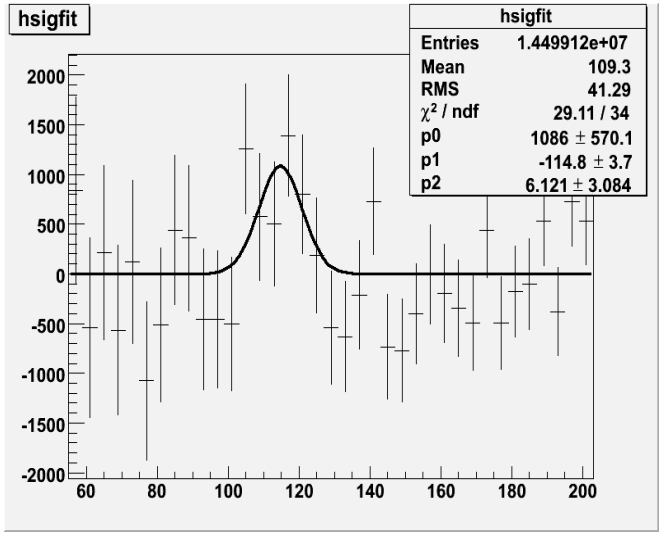


Sigma is set to a default value of 10.

BUT:
Fitted sigma is consistently underestimated!
1/3 of events have sigma below the lower limit of 5!







The problem might be rooted in the fit to BG (which precedes the fit to a Gaussian).
But it has a reasonable chisquare (within 50% from NDF).
And why is sigma consistently under-estimated?

Current problems & things to do

- Any more ways to improve signal extraction from the SIG+BG combined histogram?
- Manually apply b-tag efficiency instead of relying on AtlfastB
  -> more statistics
- If possible, get yt=40 GeV 2->3 only (or 2->3+2->4) samples, at least 1M evts
  -> will be able to safely use 4j40 LVL1 threshold