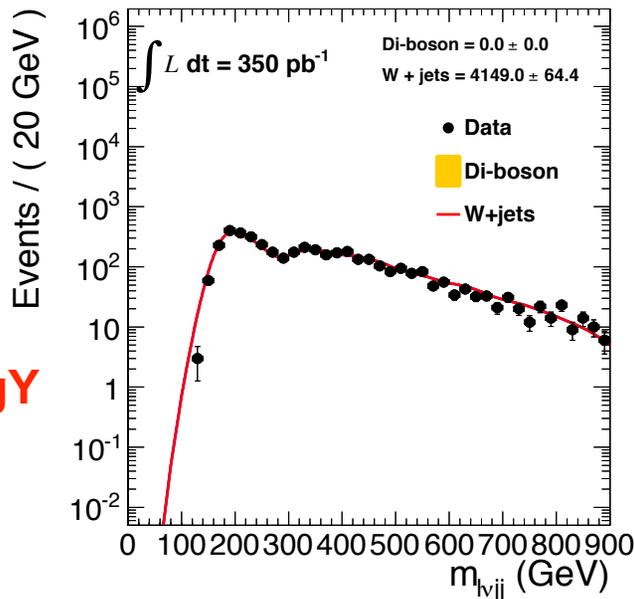
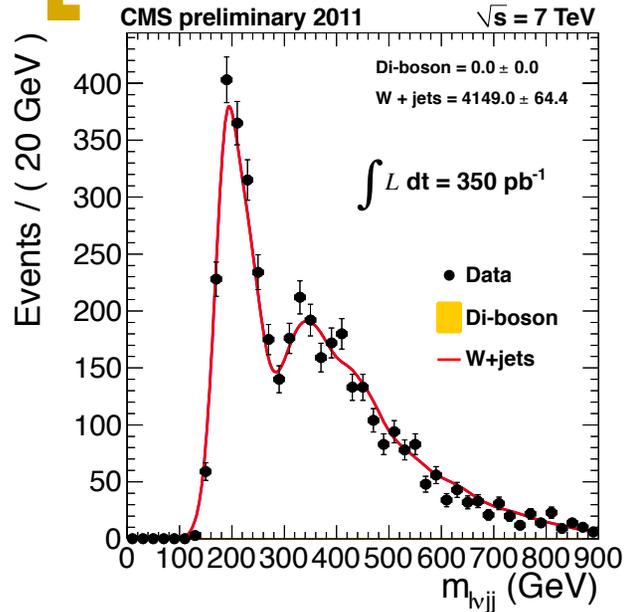


Preliminary analysis using 350 pb⁻¹ data

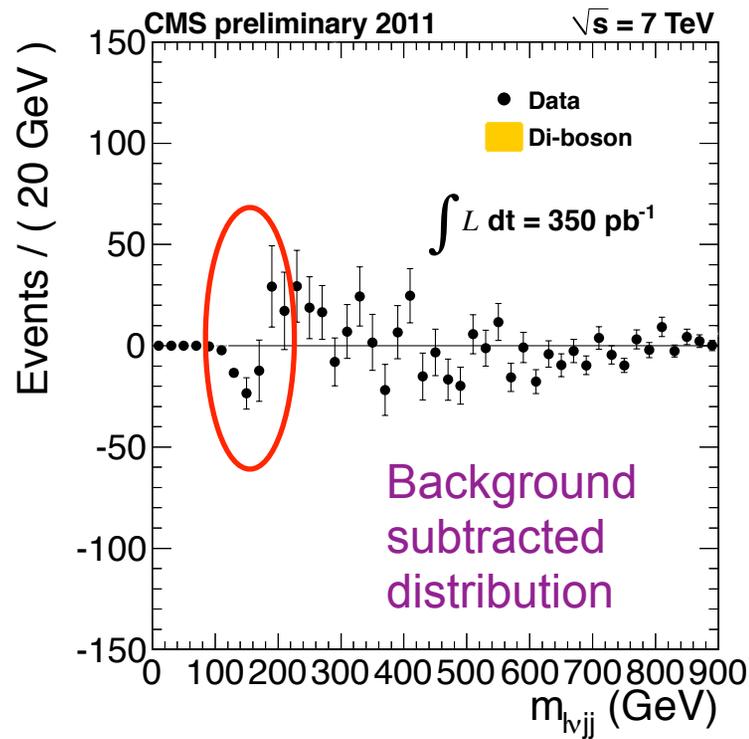
*On behalf of $H \rightarrow WW (lvjj)$ working group
(June 27, 2011)*

Recall $m_{l\nu jj}$ fit for sideband: we had problems



logY

$m_{jj} < 60 \text{ GeV}$ OR $m_{jj} > 200 \text{ GeV}$
should be able to fit the W+ jets shape



We are doing ok except near the rough edge.
We can renormalize the residual if needed.

Then we tried parametric shape



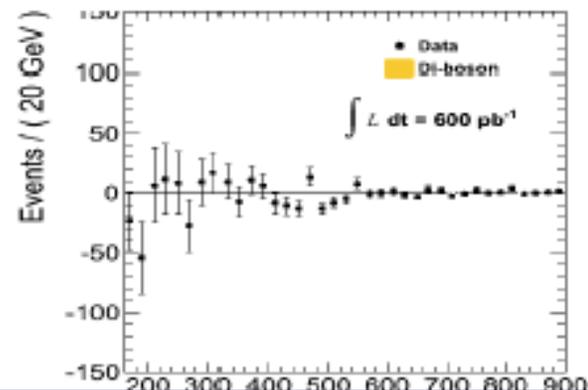
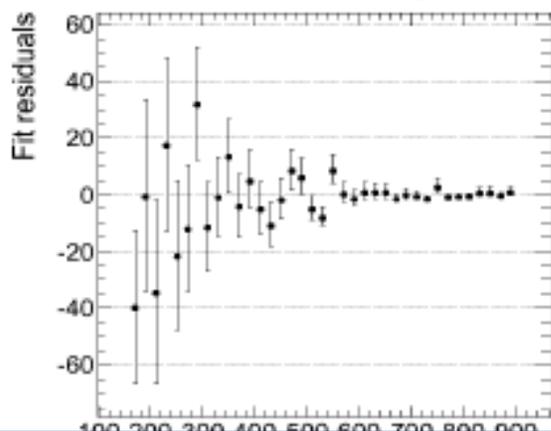
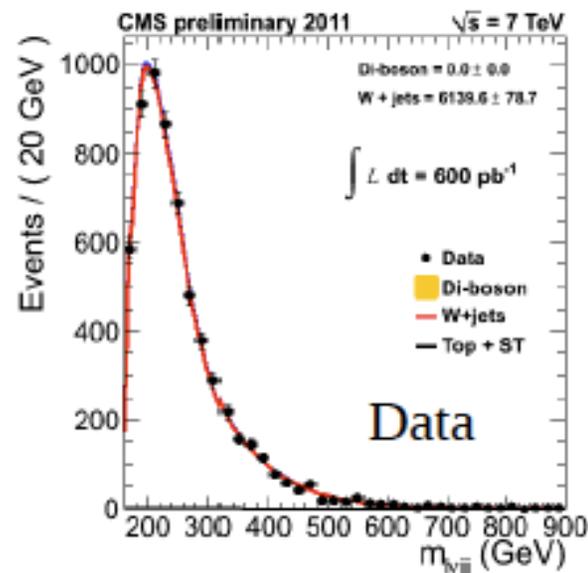
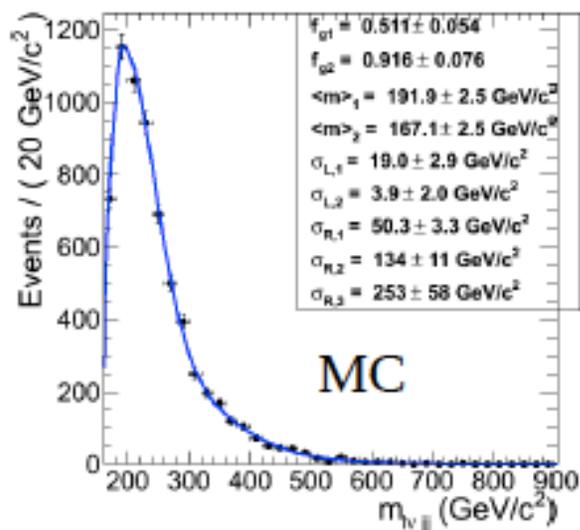
From Jake Anderson, FNAL

- A strategy to overcome the low statistics in the W +jets MC samples. Parameterize and fit the distributions in MC.
 - model is 3 bifurcated Gaussian distributions. The second and third share a mean and a left side width.
- To allow them to adapt to the data we allow the two means and the relative strengths of the 3 to float in the fit to data.
 - The parameters shift small amounts to better describe the overall shape in data.
 - The shapes are very wide and so we cannot “smooth” over a resonance since the widths are fixed from MC.
- This was verified using sidebands.

$m_{JJ} < 65 \text{ GeV}$

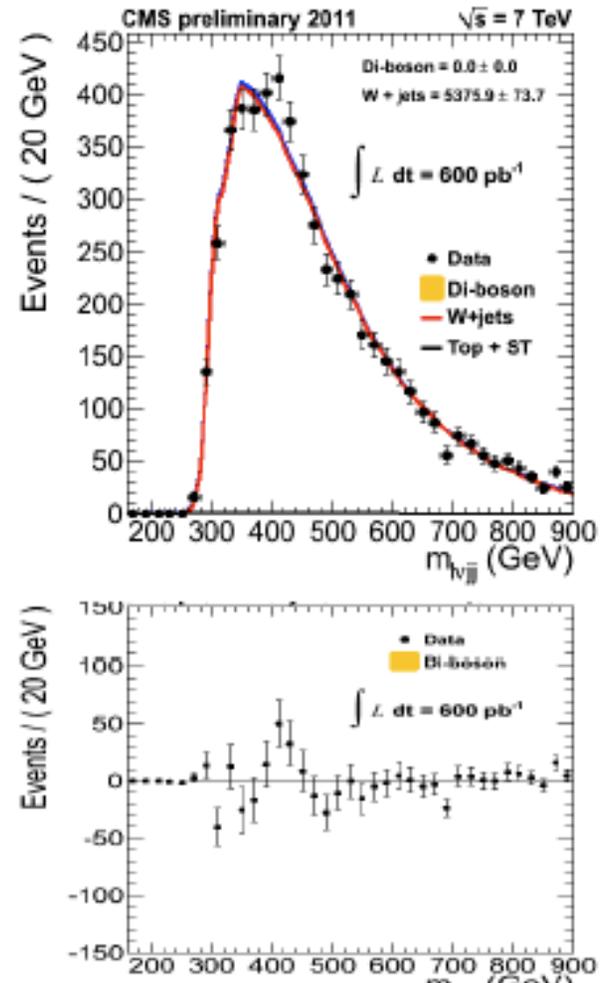
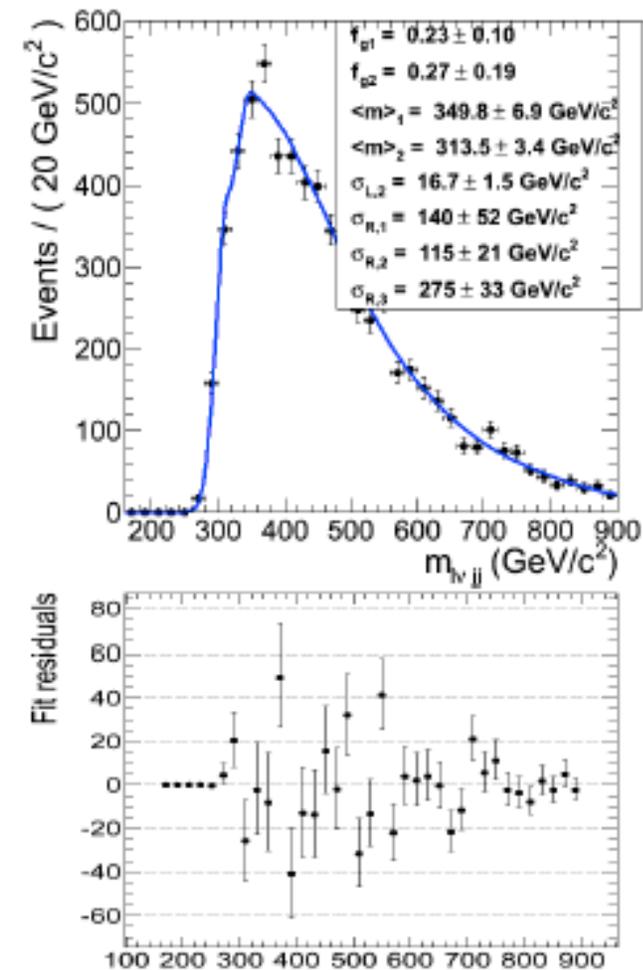


Jake Anderson



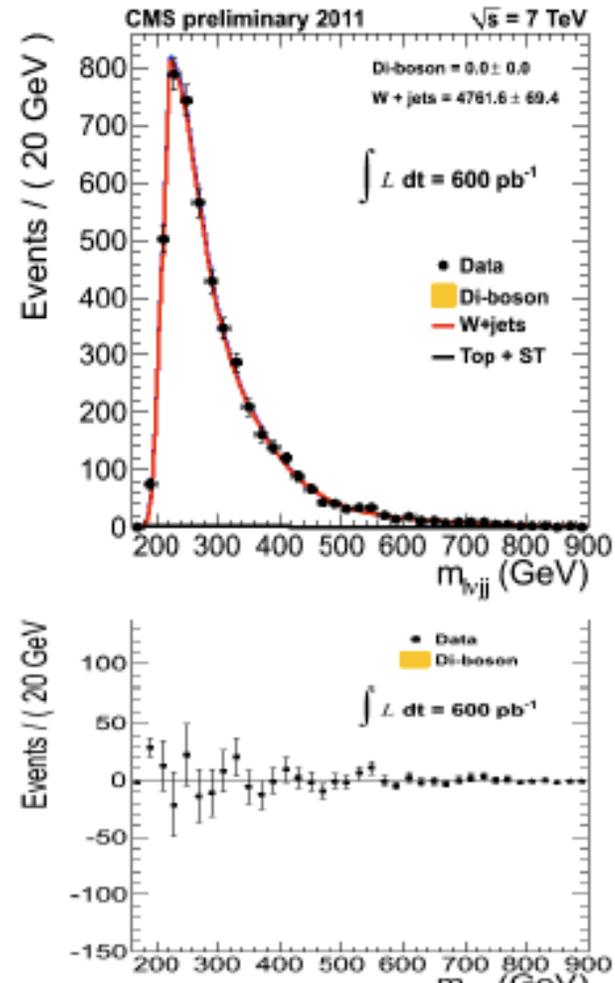
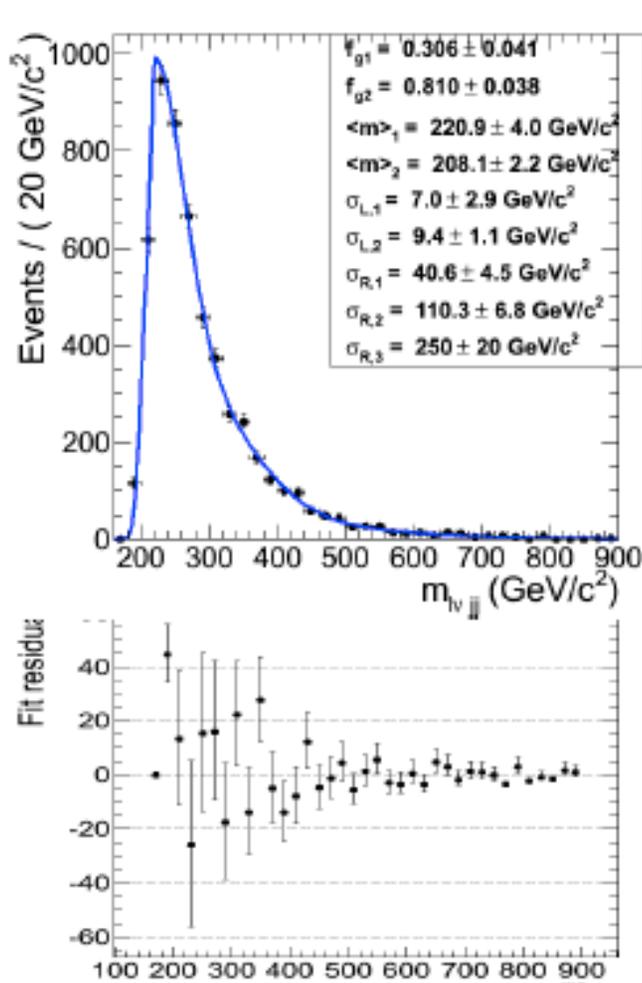
Conclusion: It works in lower sideband in both data and MC

$m_{JJ} > 180 \text{ GeV}$



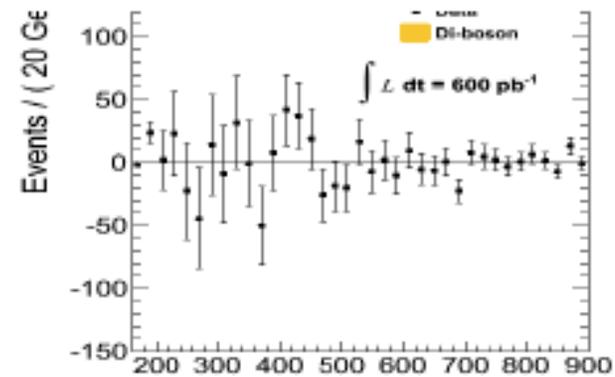
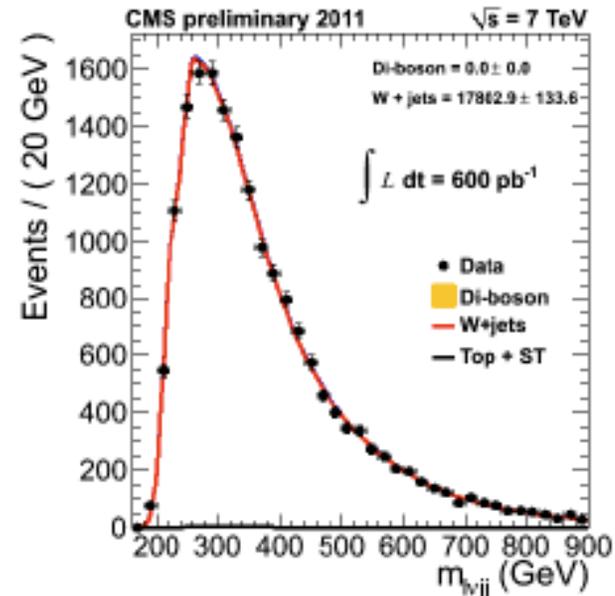
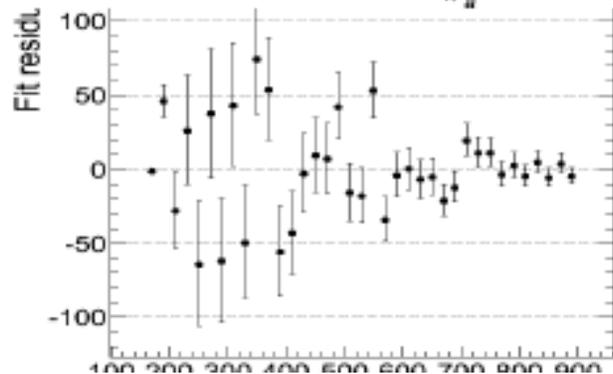
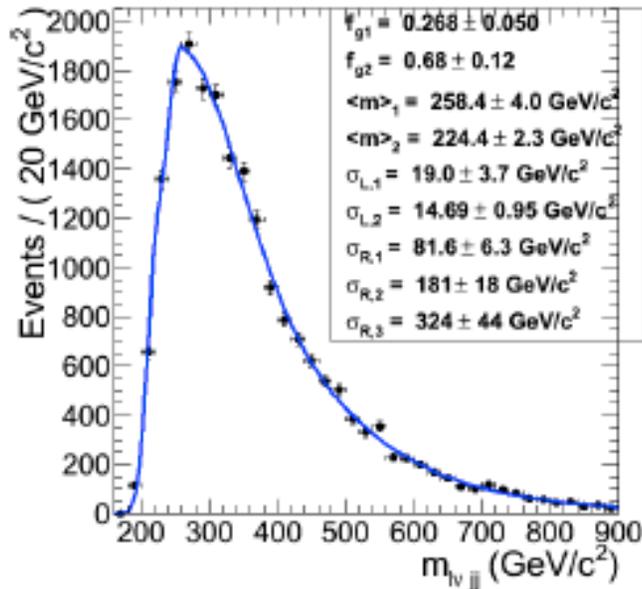
Conclusion: It works in far upper sideband in both data and MC

95 GeV < m_{JJ} < 180 GeV



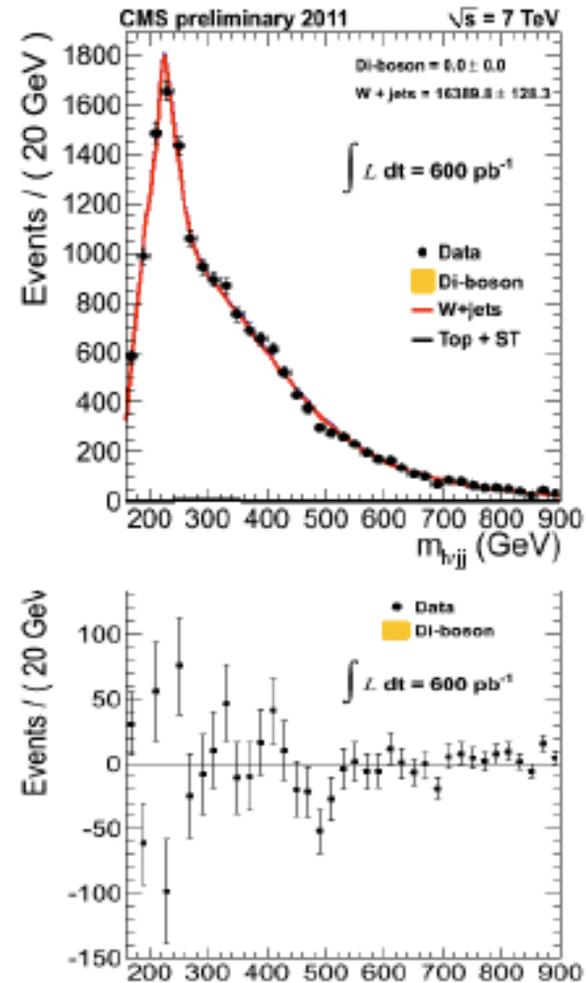
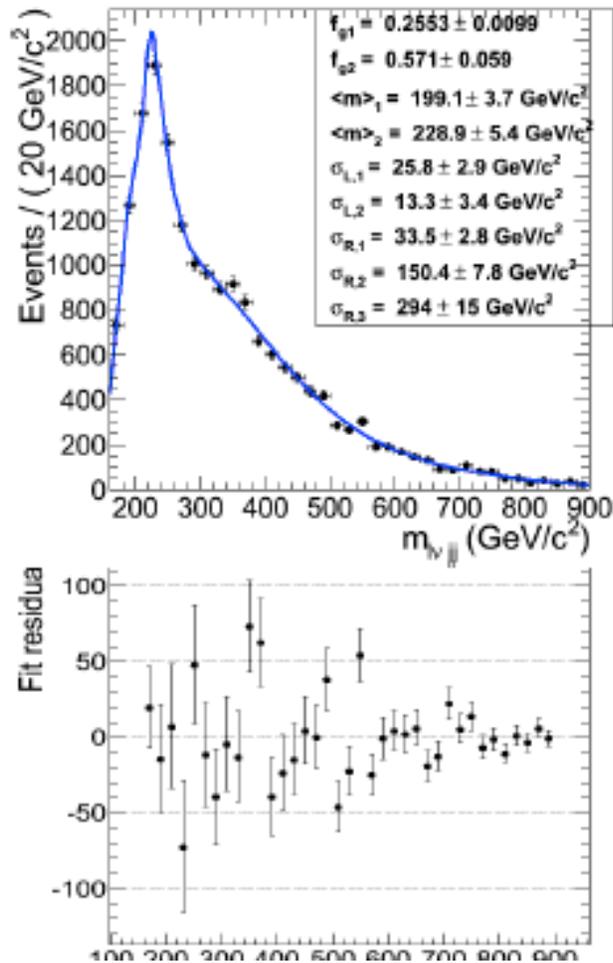
Conclusion: It works in the immediate upper sideband in both data and MC

$m_{JJ} > 95 \text{ GeV}$



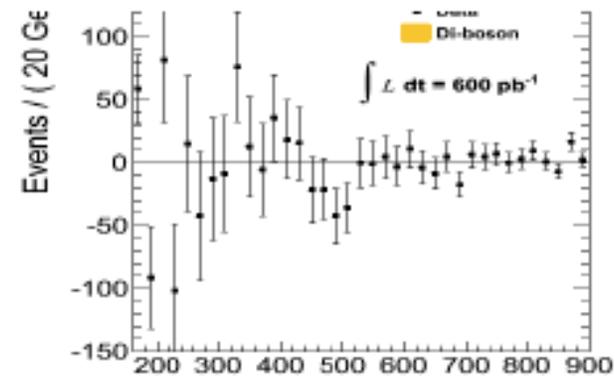
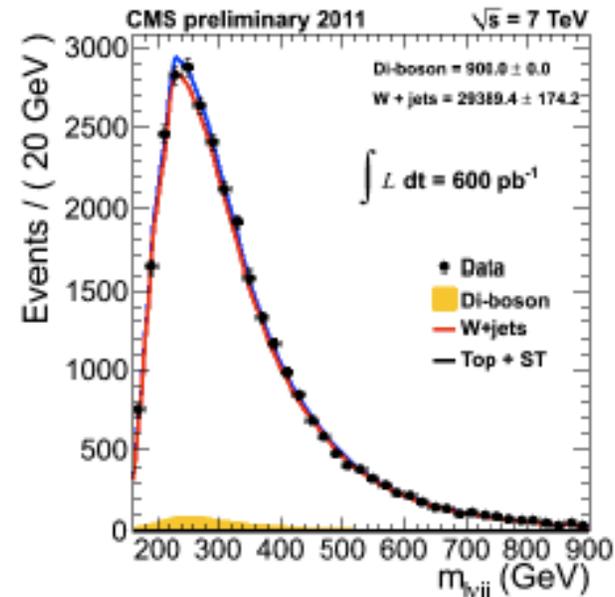
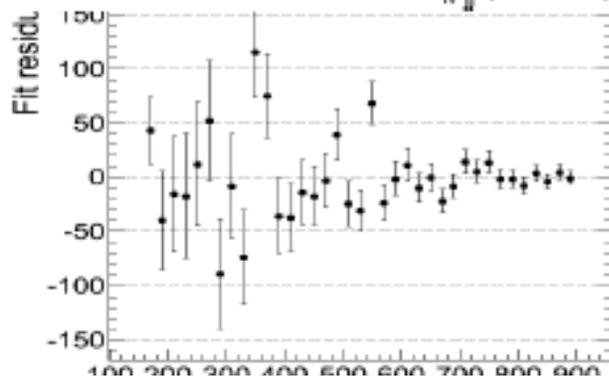
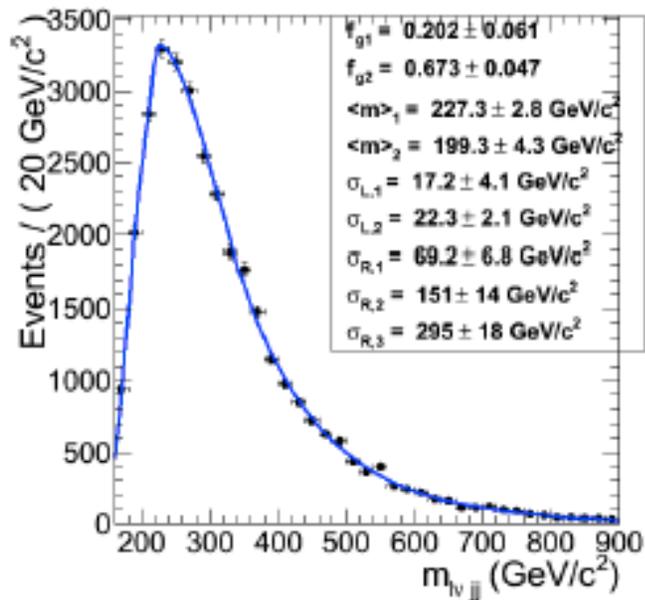
Conclusion: It works in the entire upper sideband in both data and MC

Both sidebands together



Conclusion: Still looking good in both data and MC

Full dataset (diboson yield fixed from m_{jj} fit)



Conclusion: Technique works & can be used in the signal region with simple expoln

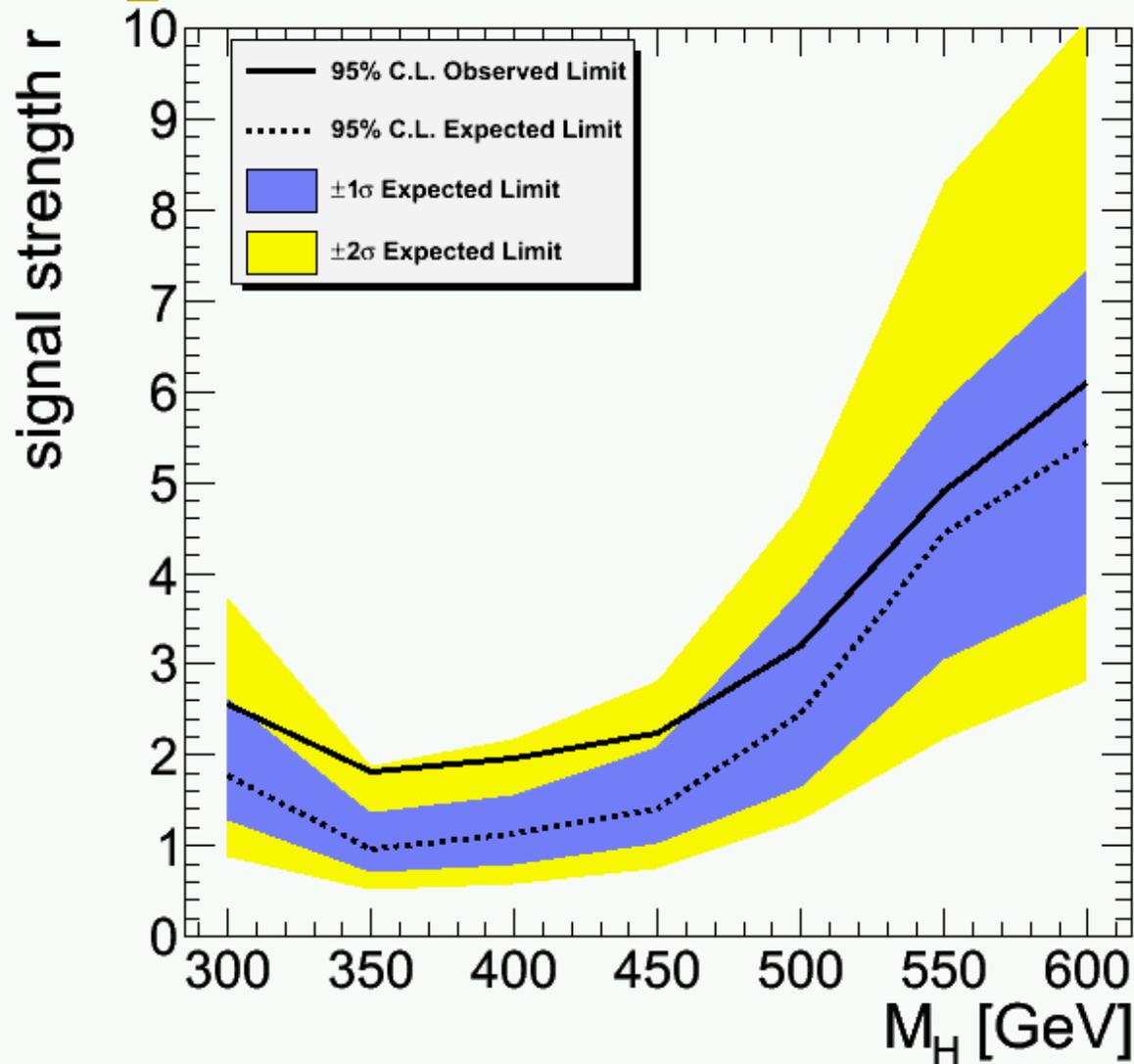
Summary from previous slides



- We've parameterized the 4-body mass spectrum for W^+ jets to obtain a smooth distribution that describes the MC.
- By allowing very limited freedom the shape is very well suited to fitting the data also.

I think now we can go ahead and repeat the fit for all mass points after using this new shape for W^+ jets background

Meanwhile limit setting machinery in works



Phil Duderø

Phil used my previous fit results (from 2 weeks ago) & “Higgs combination machinery”) to set limit. Obviously since the fit results were biased the observed limit is worse than expected limit. The first two points are missing because yield was 0.

This is a good start. At least we have capability to plug the number from fit to compute limits. Gradually will introduce shape info in the limit.

backup slides