Status/Updates of VBF MVA

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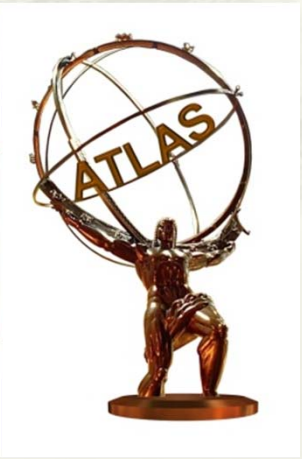
IHEP Informal Meeting 2014-01-28

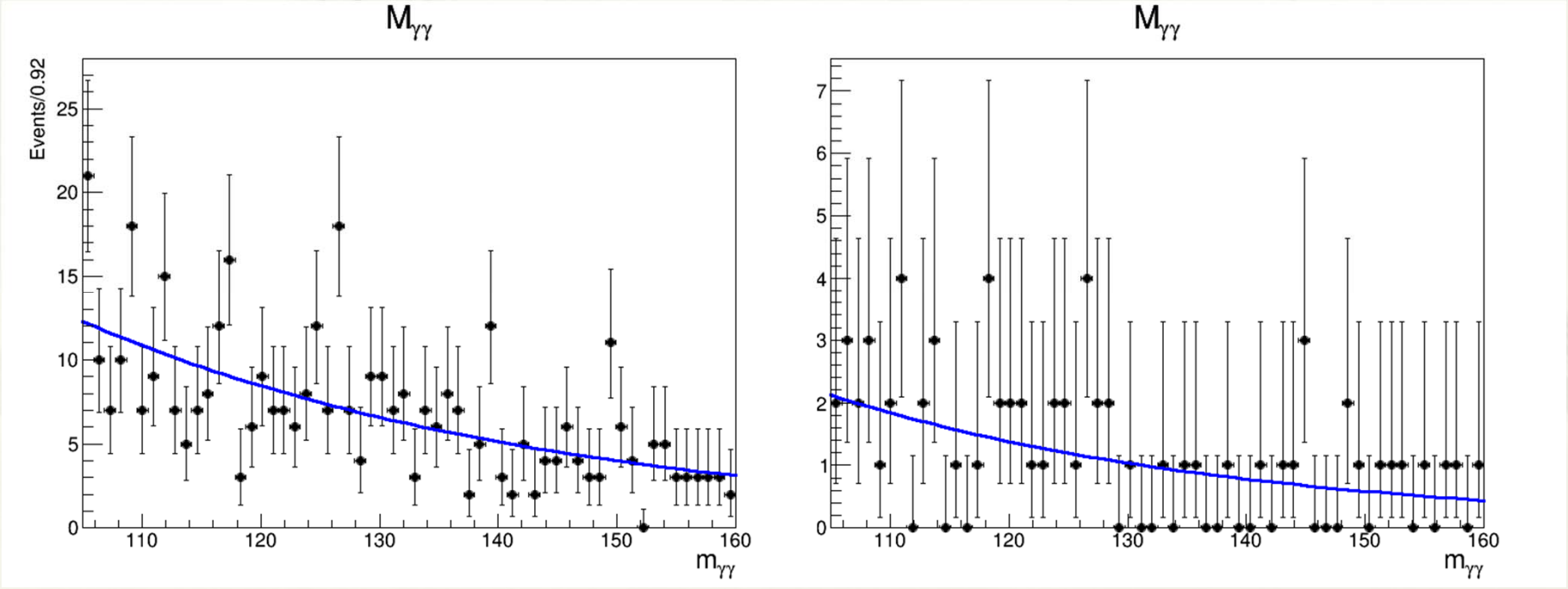


Results with reweighting

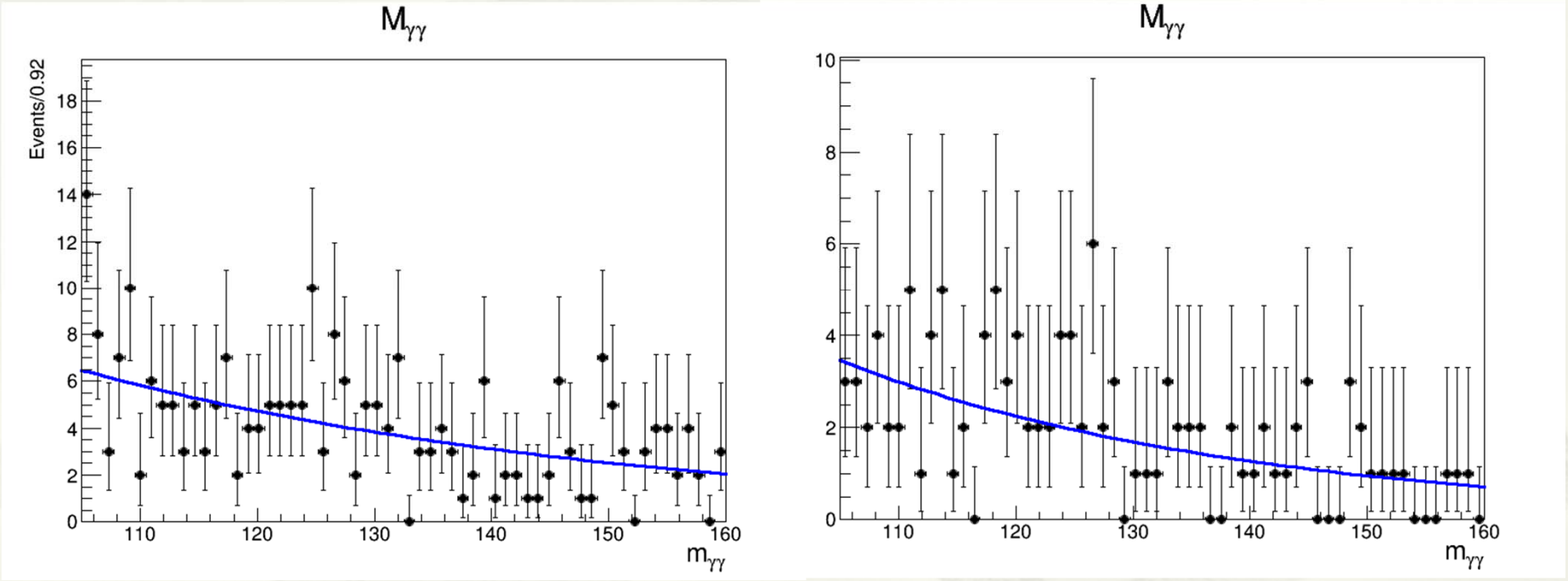
Results (5GeV window)	Moriondd loose	Moriond tight	Reweight loose	Reweight tight
VBF signal	2.5	5.6	4.7	4.3
ggF	1.8	1.5	3.1	0.9
bk model	23.1	10.8	40.5	6.7
Purity	58.0%	79.0%	59.6%	82.3%
Significance	0.50	1.49	0.70	1.45
Combined significance	1.57		1.62	
Data	242	114	413	70

Data shape

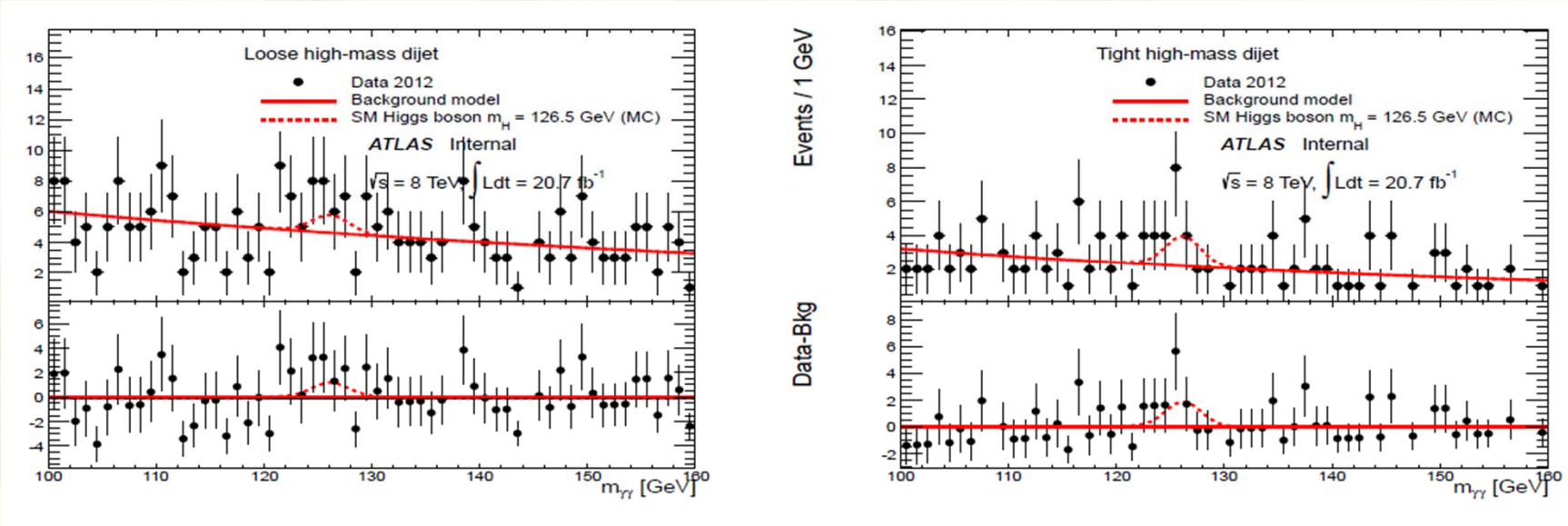
- Tight category has low statistics
- Loose category peak not as significant as before



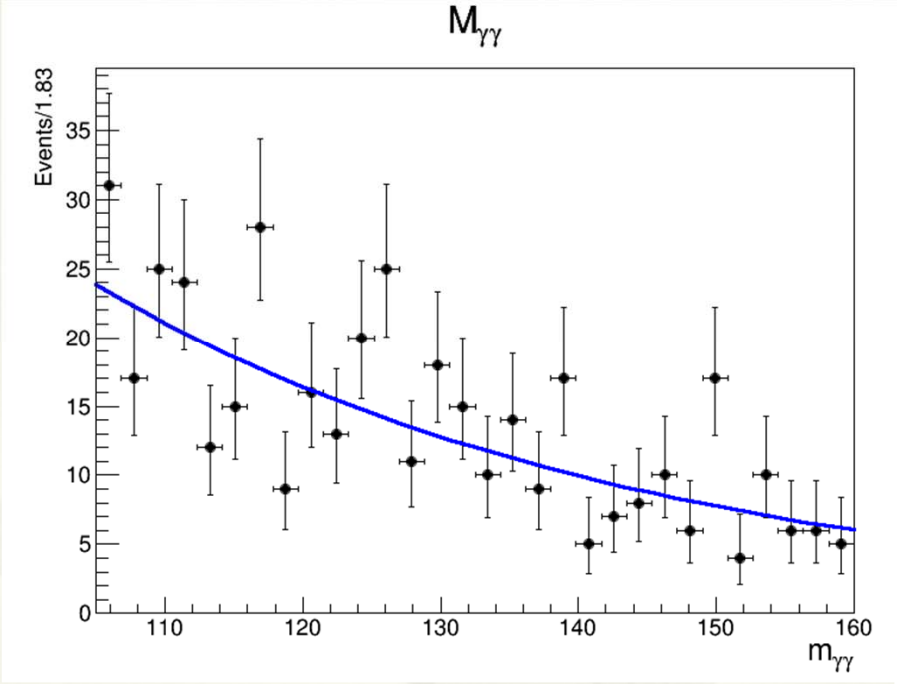
Data Shape for Moriond

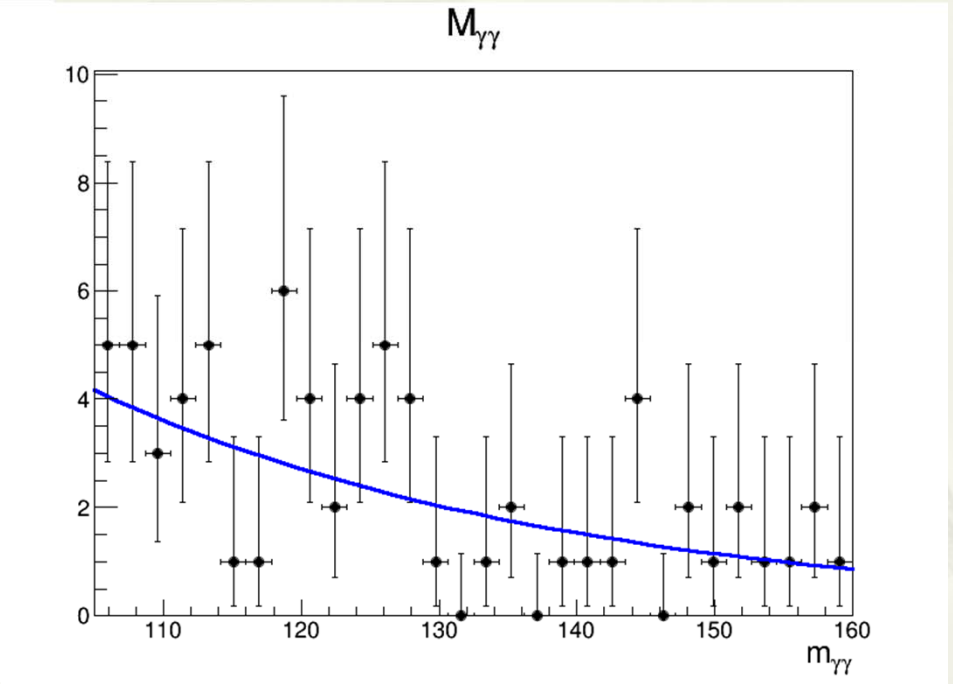


Old Moriond Plots

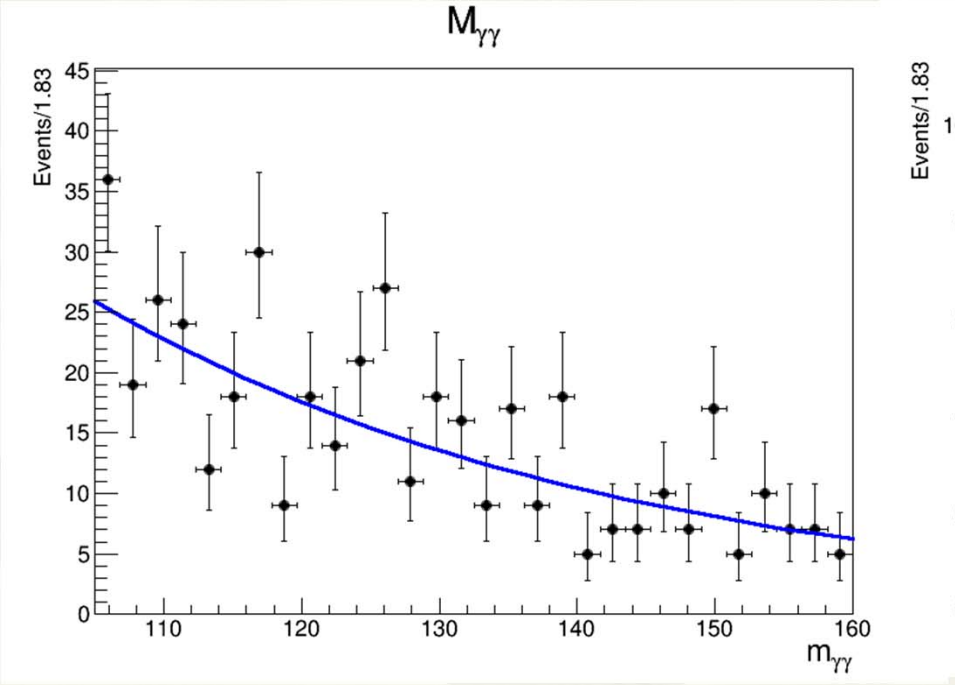


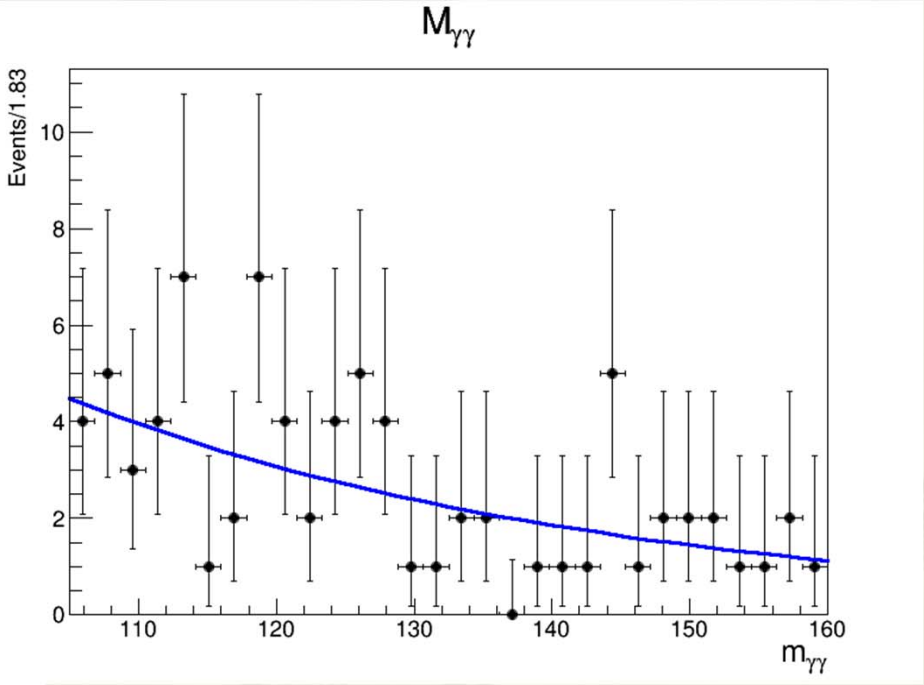
Data Shape (reweight) with 2GeV Bin



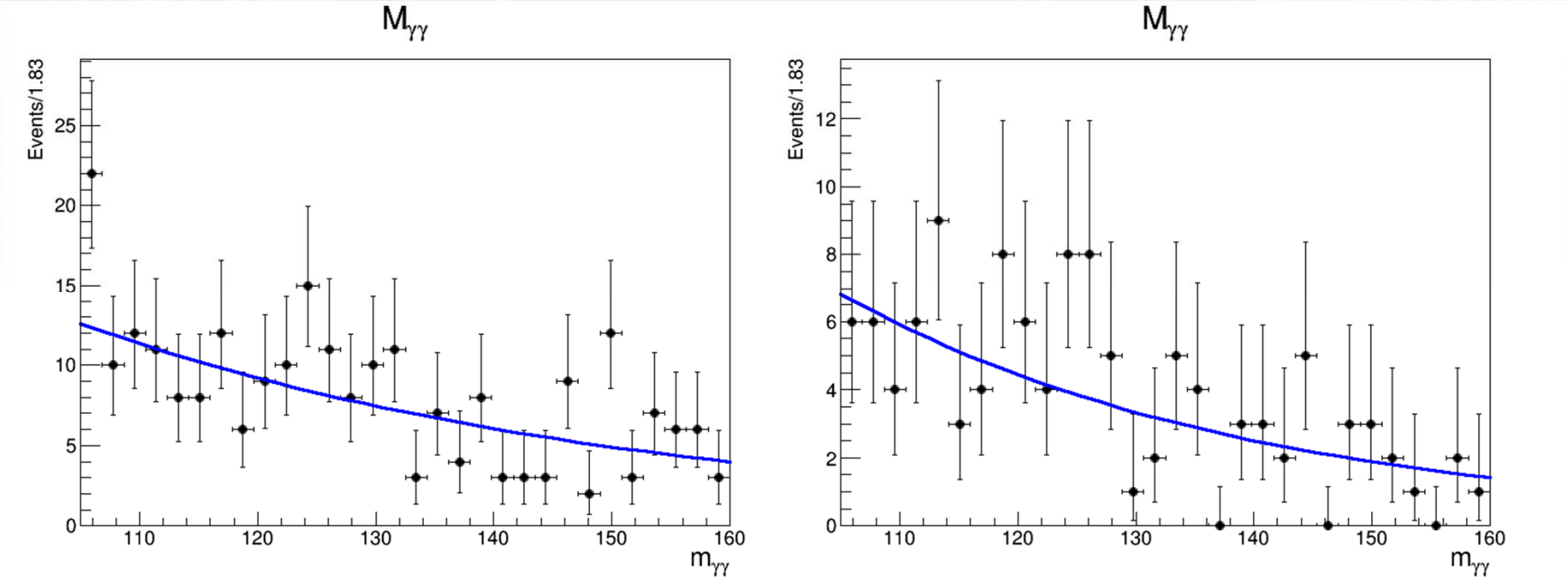


No Weight


$M_{\gamma\gamma}$
Events/1.83
45
40
35
30
25
20
15
10
5
0
110
120
130
140
150
160
$m_{\gamma\gamma}$


$M_{\gamma\gamma}$
Events/1.83
10
8
6
4
2
0
110
120
130
140
150
160
$m_{\gamma\gamma}$

Moriond


$M_{\gamma\gamma}$
Events/1.83
$m_{\gamma\gamma}$
$M_{\gamma\gamma}$
Events/1.83
$m_{\gamma\gamma}$

Back Up

Reweighting

- VBF background reweighting with Jet2_eta

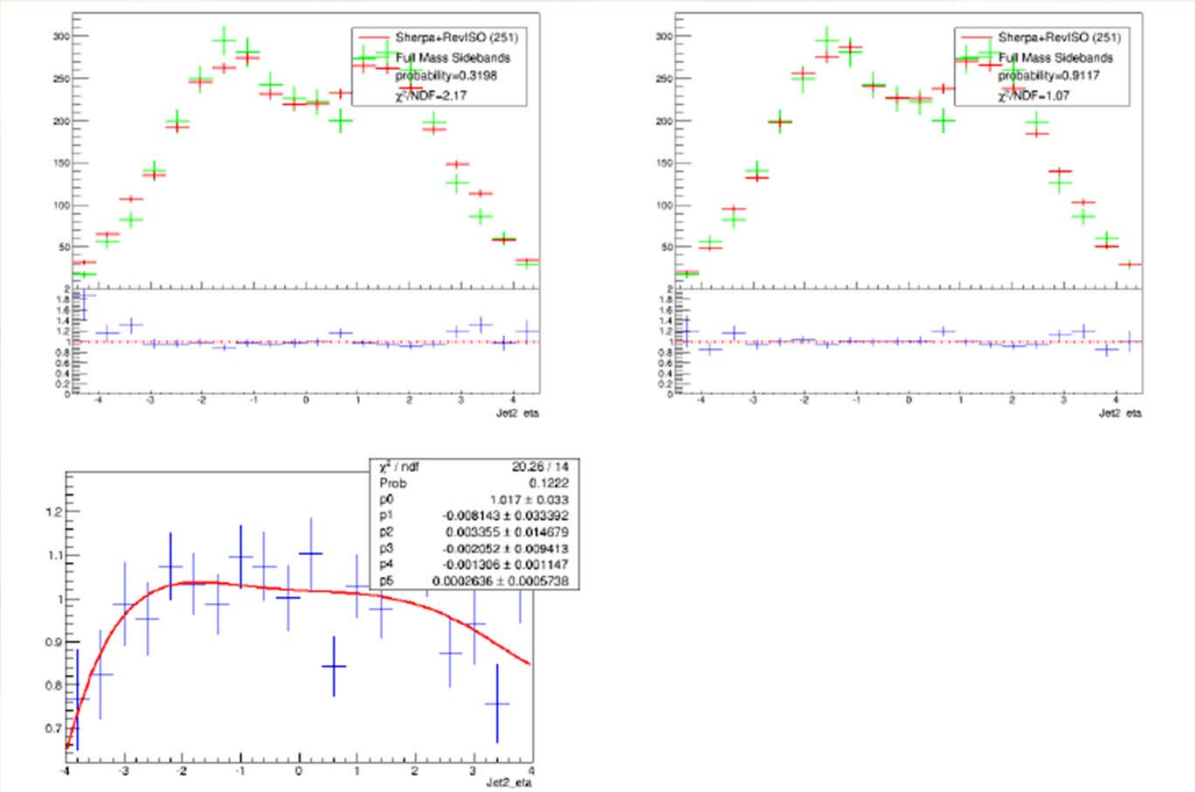
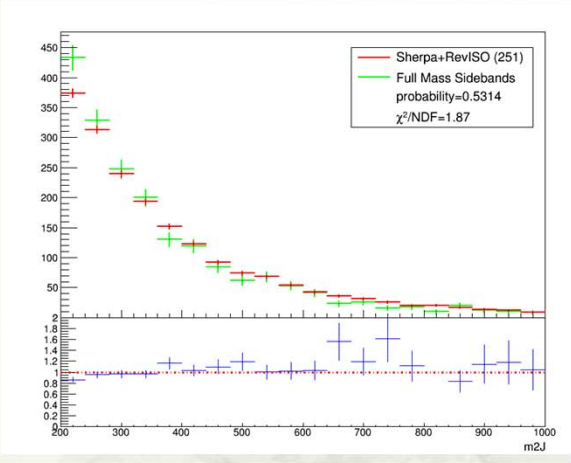
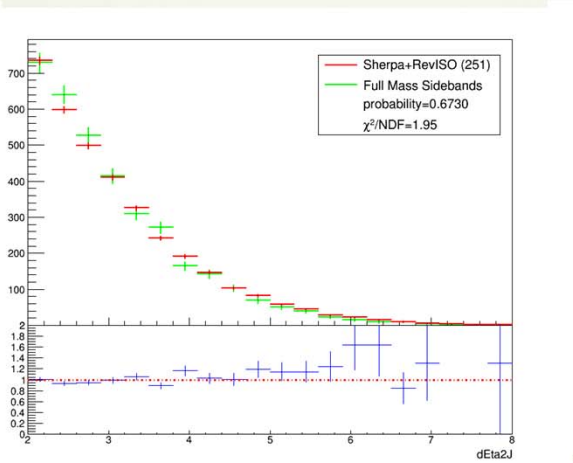
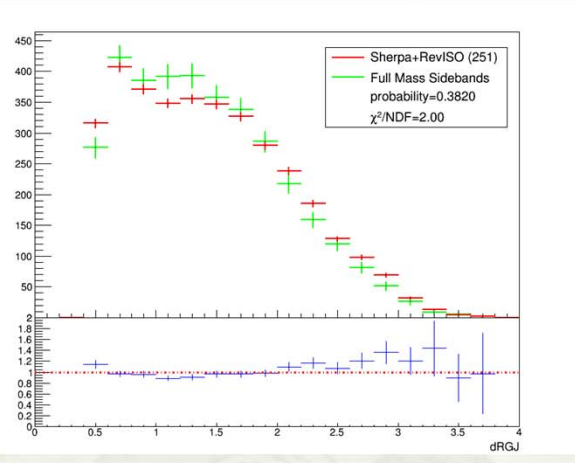


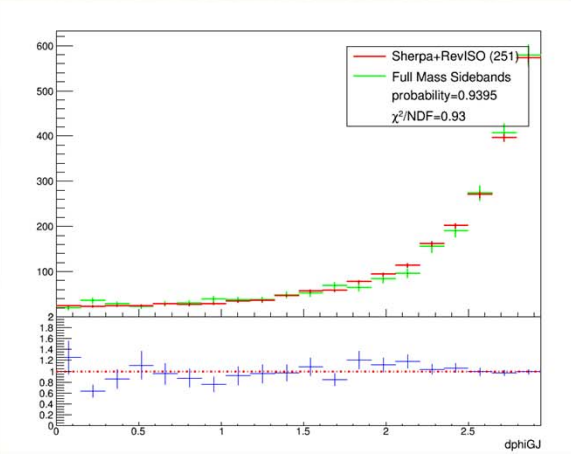
Figure 2: Sub-leading jet eta distribution before reweighting (top left), after reweighting (top right) and the reweighting function (bottom).

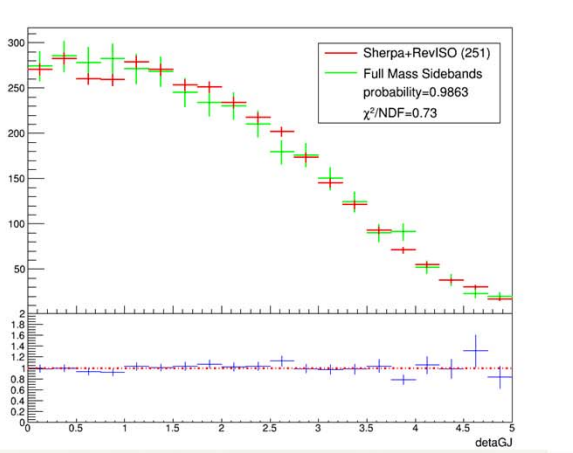
Variables before reweighting

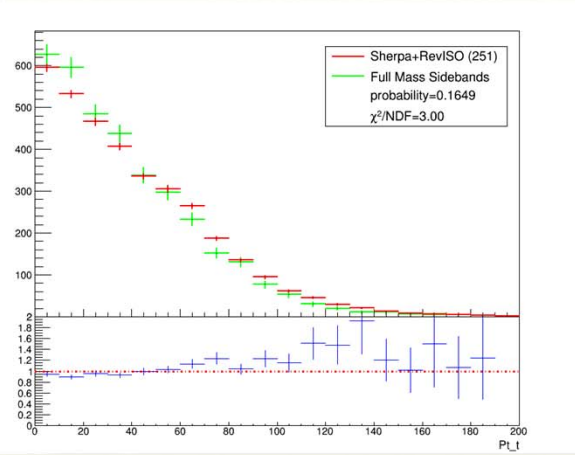




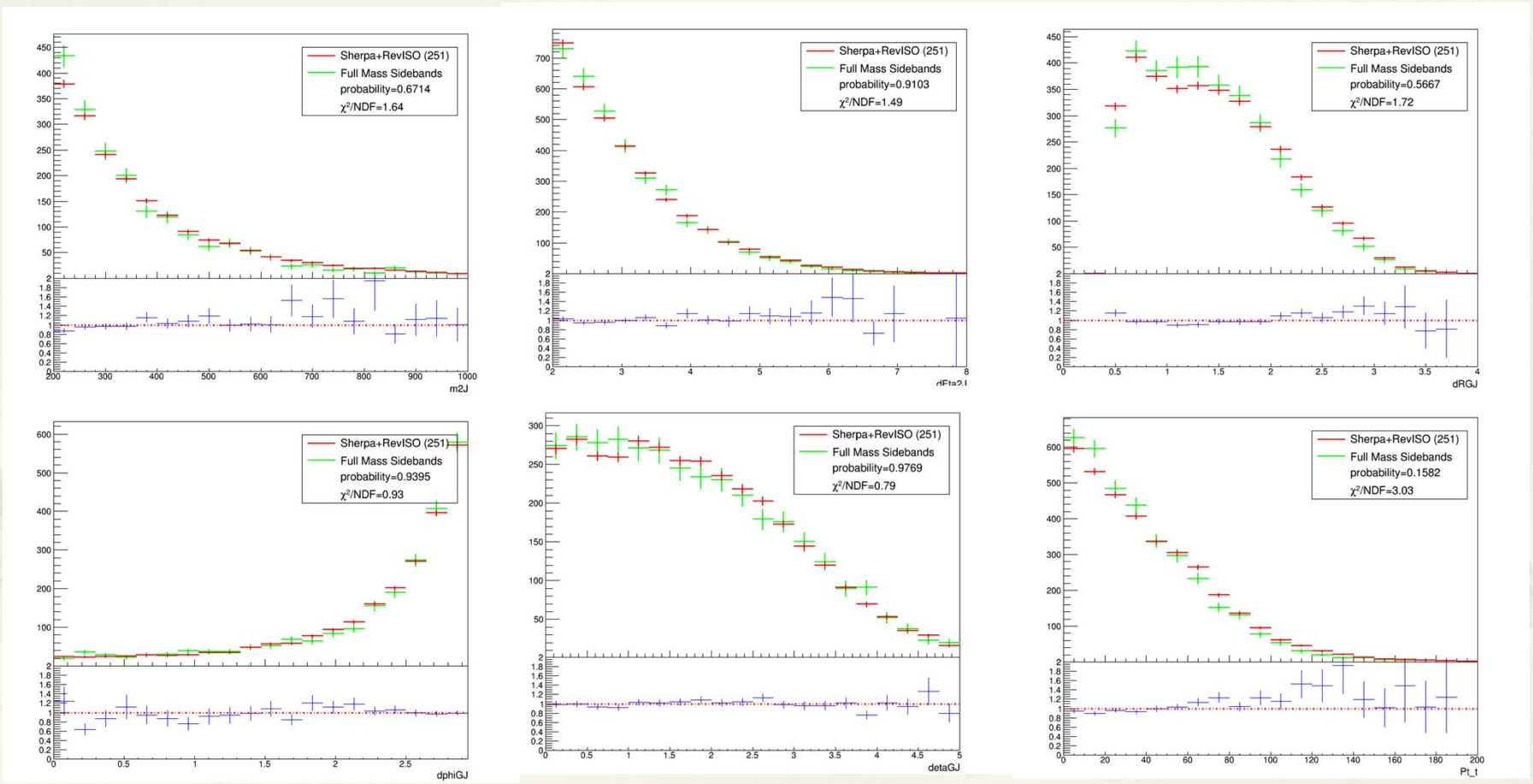




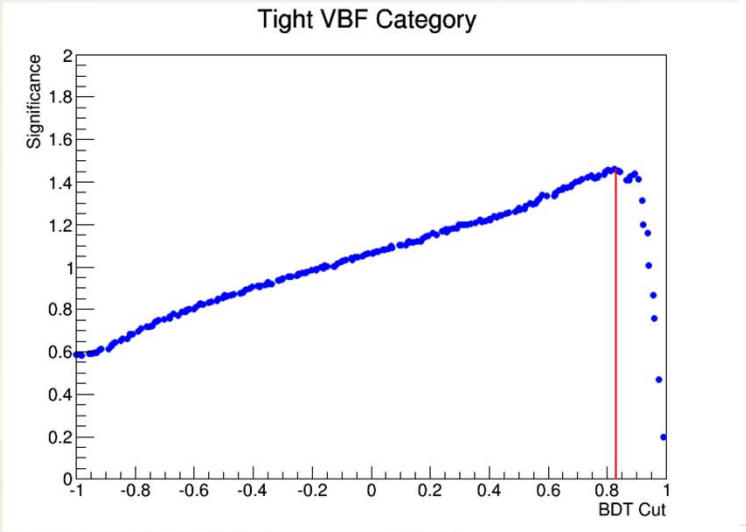


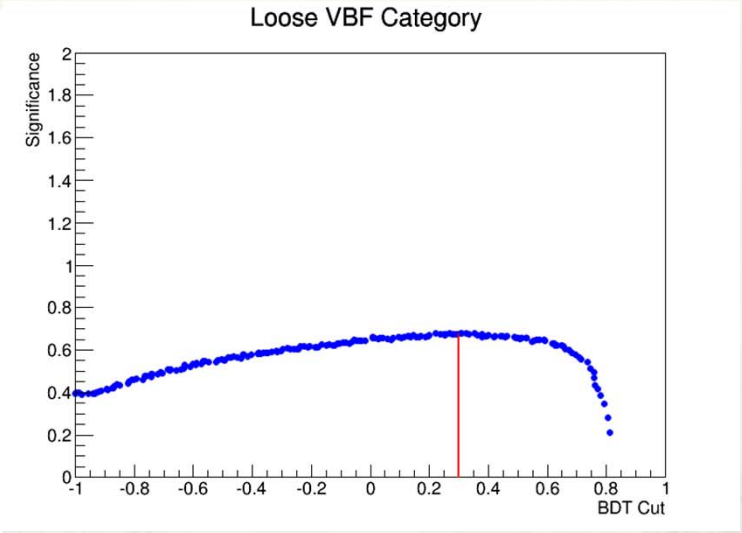


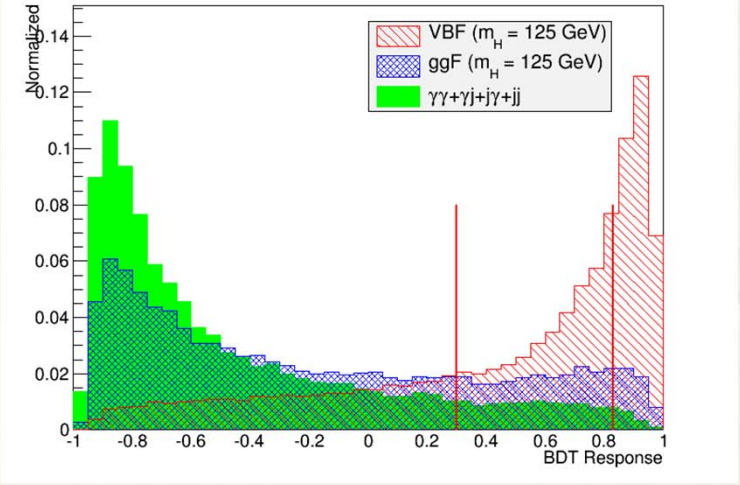
Variables after reweighting



BDT shape and optimization







Background shape check

- Good modeling
- No bias to m_γγ