



$VV \rightarrow llqq$ - Impact of W,Z res sel harmonisation

First step

**Martino Centonze^{1,2} , Gabriele Chiodini¹, Alessandra Palazzo^{1,2},
Enrico Junior Schioppa^{1,2} ,and Stefania Spagnolo^{1,2}**

¹INFN Lecce, ²University of Salento Lecce

VZ $llqq/vvqq$ bi-weekly meeting xx,xx,yyyy

W,Z res sel in AnalysisReaderVV

```
EL::StatusCode AnalysisReaderVV :: triggerSelection2L(ResultsZV2Lep& sel){...  
  
...  
//Find Z->jj candidate  
//First look for two leading b-jets  
//First look for two leading jets  
  
...  
//Find W->jj candidate  
//Look for two leading jets  
  
EL::StatusCode AnalysisReaderZV2Lep :: resolvedAnalysis(ResultsZV2Lep& sel,  
std::string decaymode ){...  
  
...  
//decaymode WZ: W mass cut  
//decay mode ZZ: Z mass cut
```

How much new resonances sensitivity deteriorates
harmonising W,Z->jj selection?

Try W jets res sel as Z jets sel



Z2Lep configuration file

From gitlab (thanks Rob)

https://gitlab.cern.ch/CxAODFramework/CxAODReader_VVSemileptonic/-/blob/master/CxAODReader_VVSemileptonic/data/ZV2Lep_a_UFO_PFlow.cfg

Input files:

```
string dataset_dir = /eos/atlas/atlascerngroupdisk/phys-hdbs/db1/  
VVsemilep2nd/r33-08/UFO_PFlow_Btag201903/HIGG2D4
```

```
BG: Diboson Wjets Zjets stop ttbar
```

```
SNG: HVTWZ
```

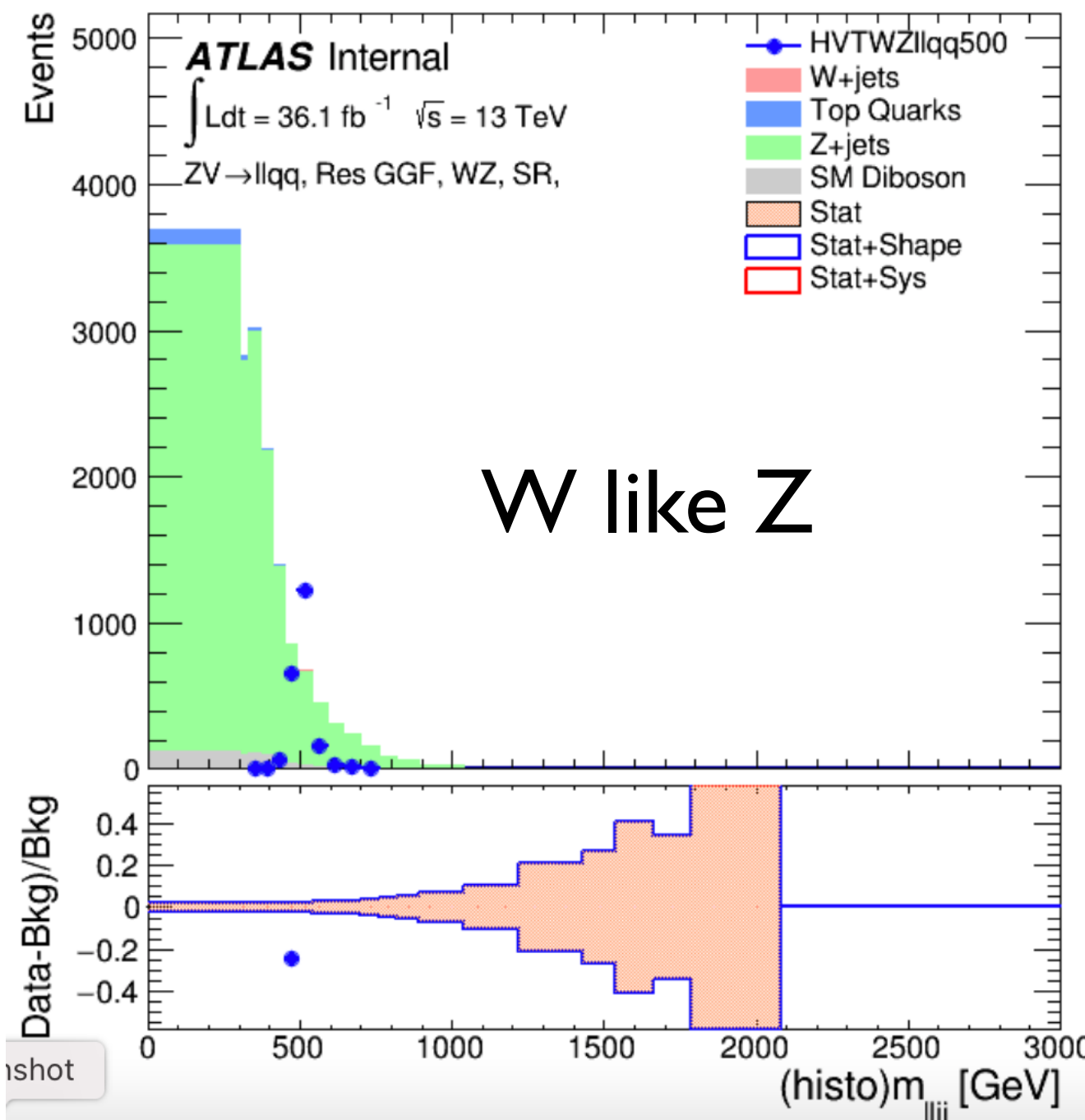
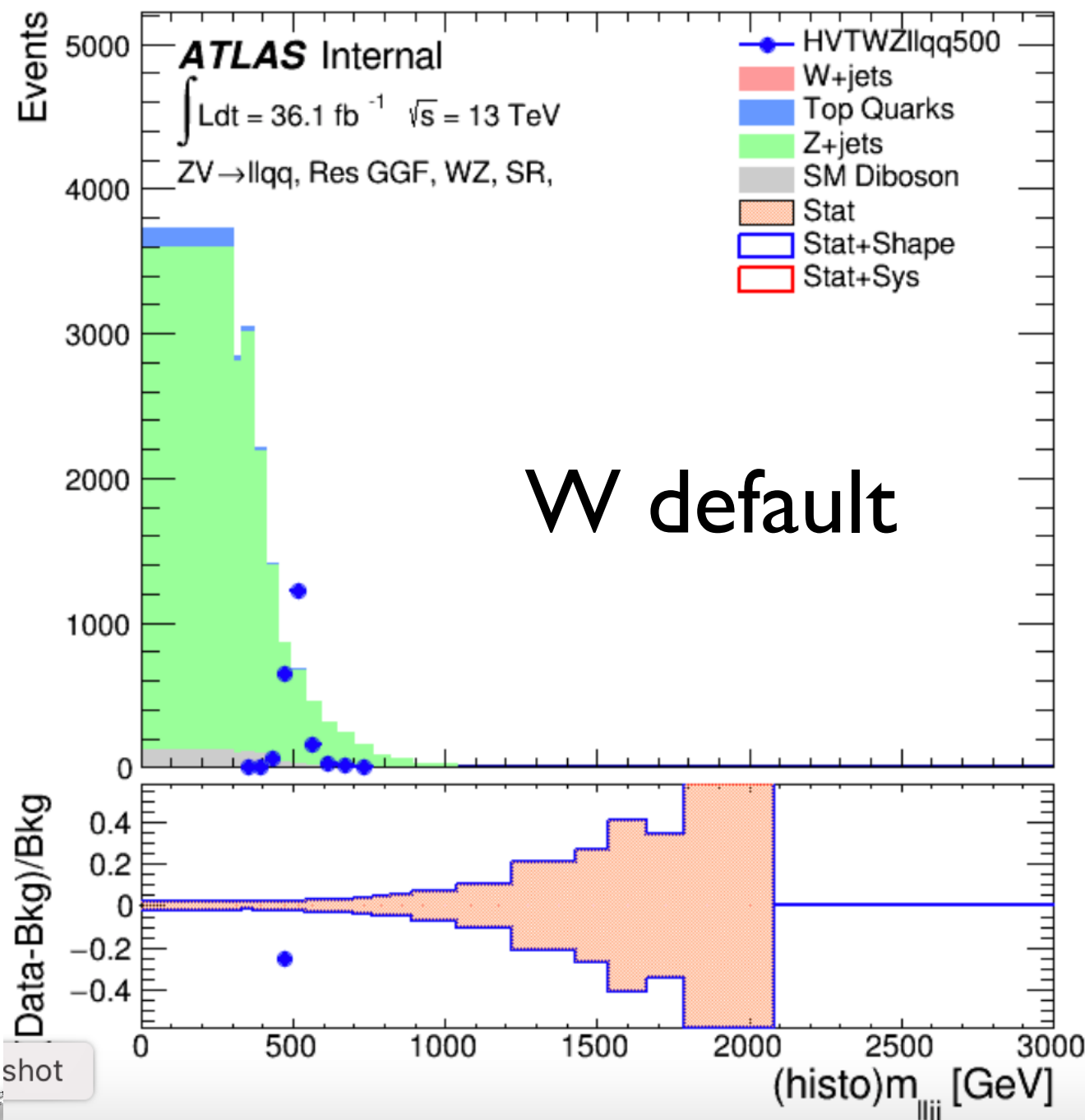


Plots and Yields from

[https://gitlab.cern.ch/CxAODFramework/
CxAODReader_VVSemileptonic/-/blob/master/
CxAODReader_VVSemileptonic/macros/
makePlots2Lepton_Syst.cxx](https://gitlab.cern.ch/CxAODFramework/CxAODReader_VVSemileptonic/-/blob/master/CxAODReader_VVSemileptonic/macros/makePlots2Lepton_Syst.cxx)



Results: $ZW \rightarrow lqq$, Res_GGF_ZW_SR



ZW->llqq, Res_GGF_ZW_SR

sampleName	entries	integral	error	error/integ.
W	19	3.19976	1.00994	0.315629
stopWt	67	8.52418	1.05598	0.123881
stopt	4	0.243763	0.124501	0.510746
stops	0	0	0	0
ttbar	3617	225.724	4.58854	0.020328
Z	205342	15340.3	127.962	0.00834157
ZZ	48463	267.768	2.4591	0.00918369
WZ	17742	378.075	4.73779	0.0125314
WW	0	0	0	0
bkg:	275254	16223.8		
HVTWZllqq500	1861	2172.11		

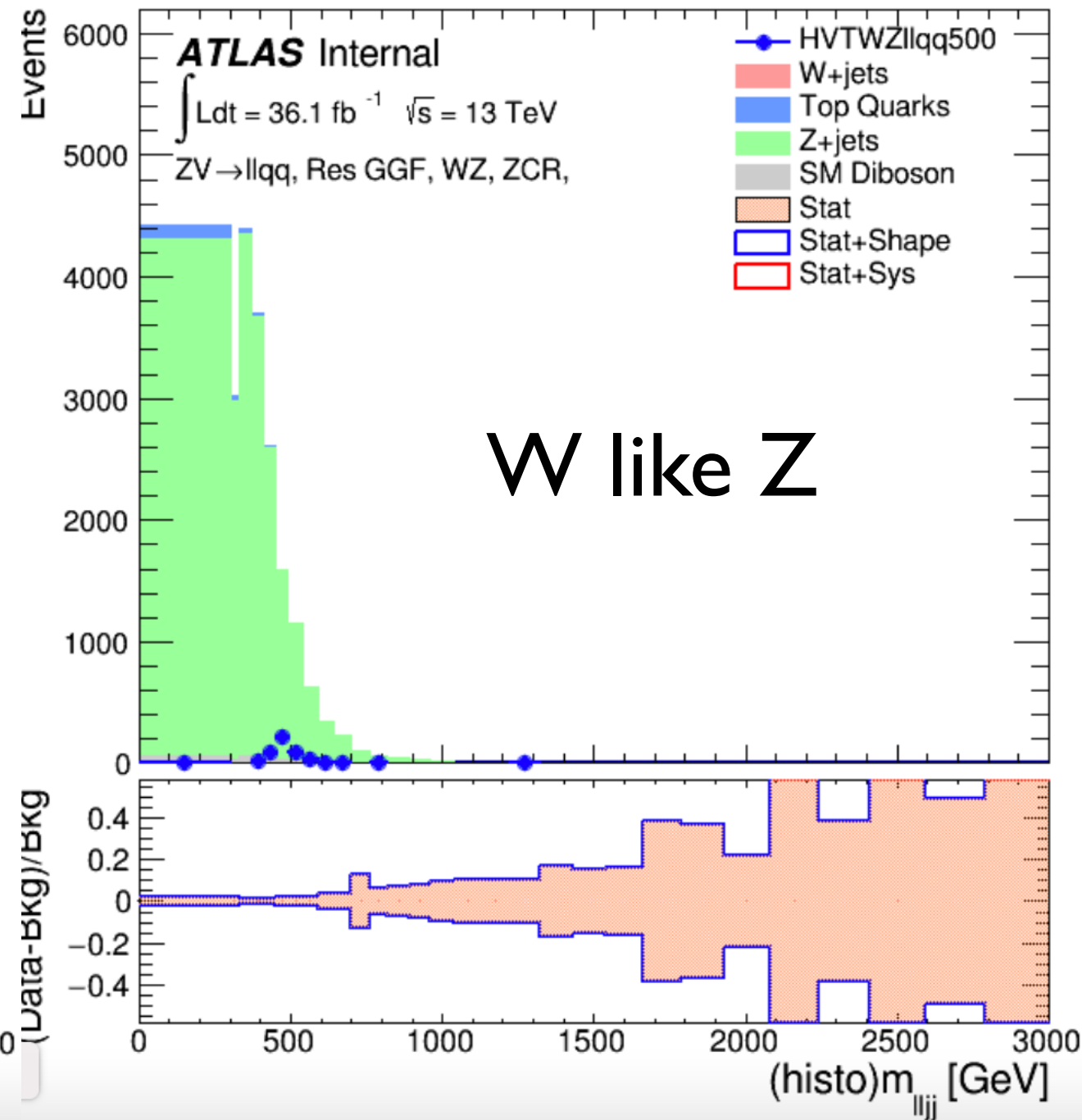
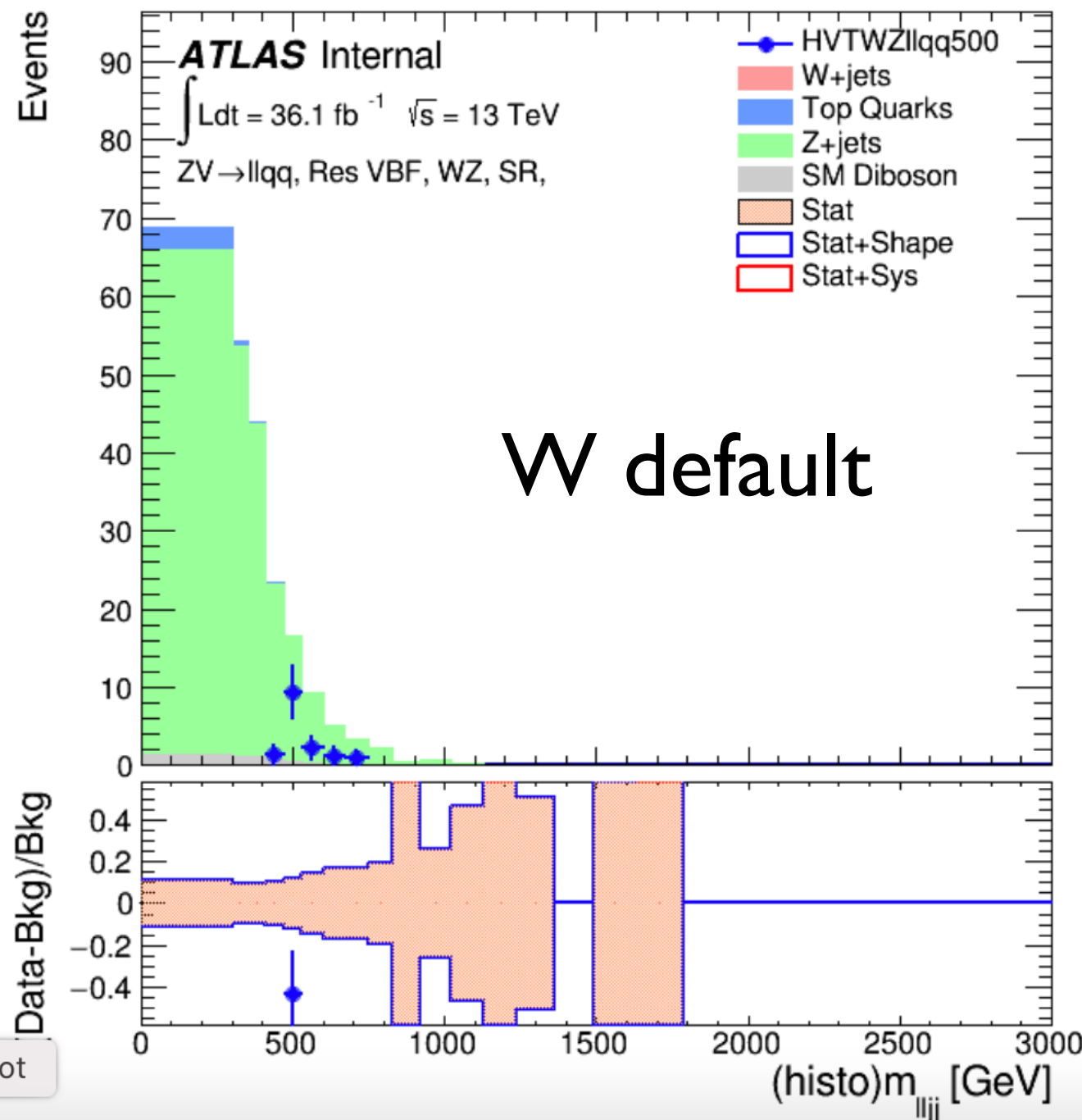
W default

sampleName	entries	integral	error	error/integ.
W	19	3.19976	1.00994	0.315629
stopWt	60	7.5754	0.992716	0.131045
stopt	4	0.243763	0.124501	0.510746
stops	0	0	0	0
ttbar	2897	184.055	4.16724	0.0226413
Z	202229	15234.8	127.878	0.00839383
ZZ	47647	264.606	2.44525	0.00924108
WZ	17677	375.473	4.72001	0.0125708
WW	0	0	0	0
bkg:	270533	16069.9		
HVTWZllqq500	1857	2167.52		

W like Z



Results: $ZW \rightarrow l\bar{l}q\bar{q}$, Res_GGF_ZW_ZC



ZW->lqq, Res_GGF_ZW_ZC

sampleName	entries	integral	error	error/integ.
W	10	1.32314	0.503939	0.380868
stopWt	73	9.05477	1.08037	0.119315
stopt	1	0.0681949	0.0681949	1
stops	0	0	0	0
ttbar	3867	235.447	4.59215	0.019504
Z	304250	21864.7	145.879	0.00667189
ZZ	21261	116.899	1.57244	0.0134513
WZ	8703	220.497	3.84836	0.0174531
WW	2	0.486217	0.347757	0.71523
bkg:	338167	22448.4		
HVTWZ1lqq500	402	469.442		

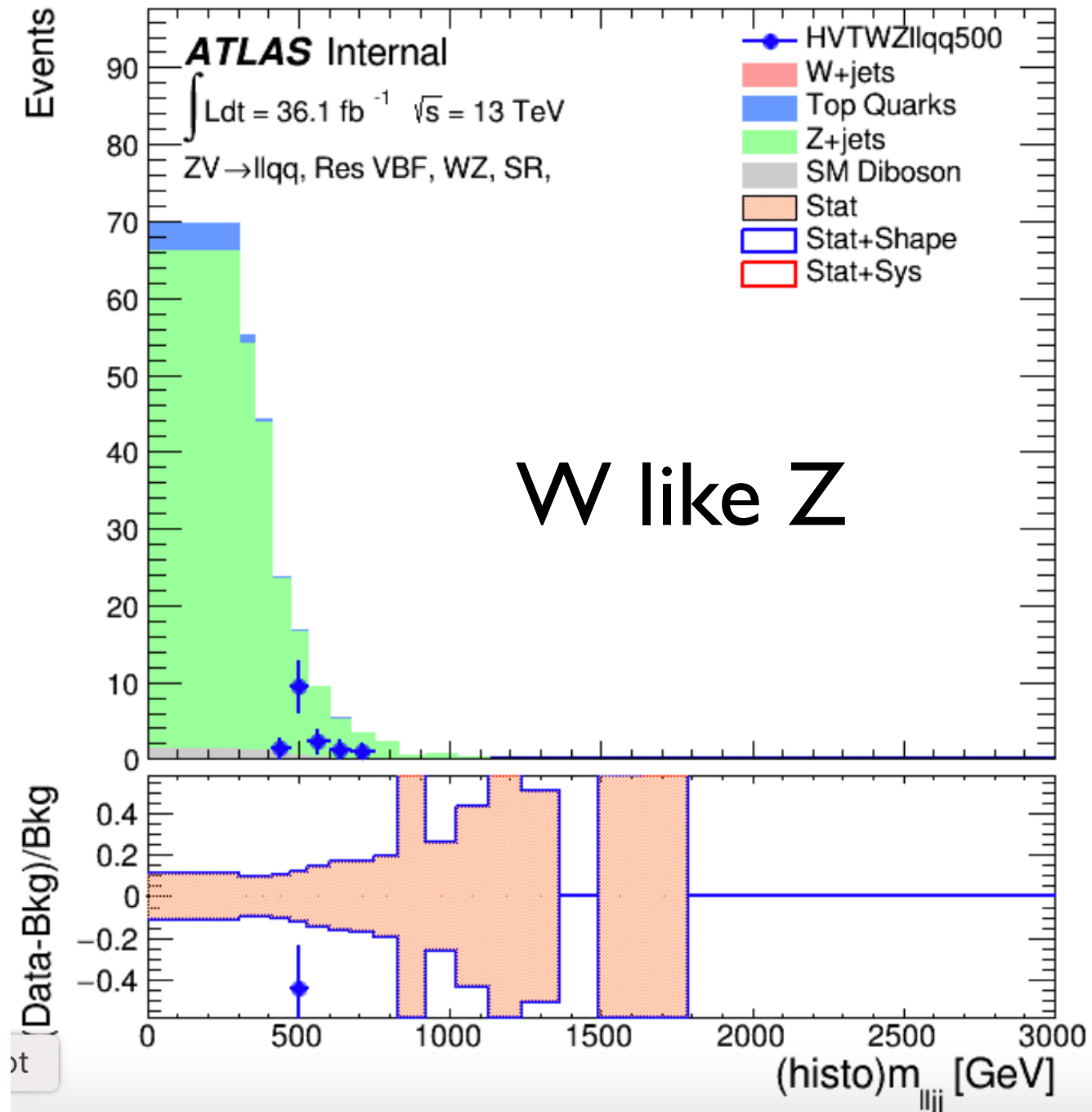
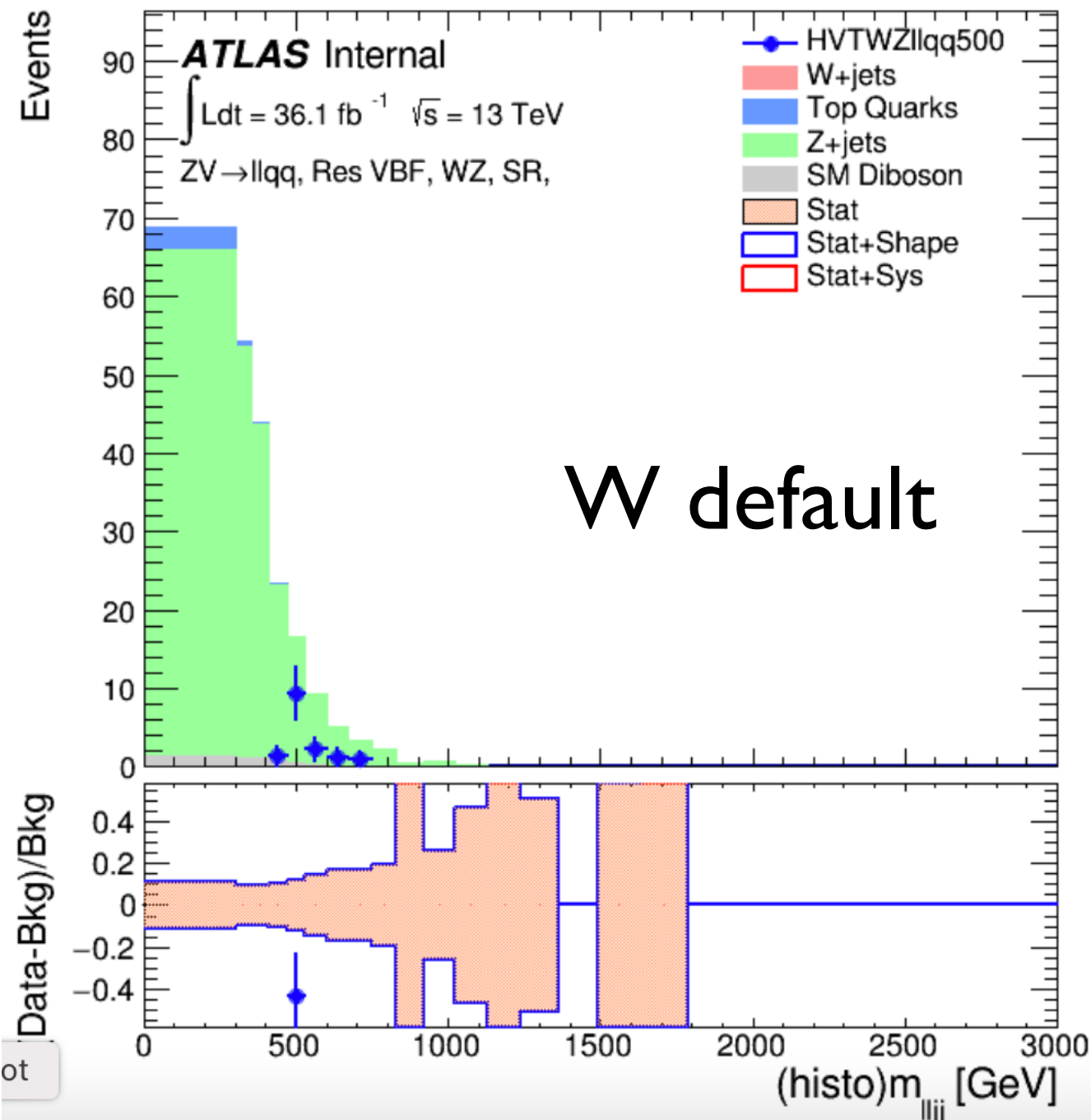
W default

sampleName	entries	integral	error	error/integ.
W	10	1.32314	0.503939	0.380868
stopWt	70	8.64666	1.05412	0.121911
stopt	1	0.0681949	0.0681949	1
stops	0	0	0	0
ttbar	3051	185.883	4.08298	0.0219654
Z	300212	21731.7	145.786	0.00670845
ZZ	20265	113.026	1.54852	0.0137005
WZ	8662	218.829	3.83388	0.01752
WW	2	0.486217	0.347757	0.71523
bkg:	332273	22259.9		
HVTWZ1lqq500	399	465.728		

W like Z



Results: $ZW \rightarrow l\bar{l}q\bar{q}$, Res_VBF_ZW_SR



ZW->lqq, Res_VBF_ZW_SR

sampleName	entries	integral	error	error/integ.
W	0	0	0	0
stopWt	2	0.253805	0.179609	0.707666
stopt	0	0	0	0
stops	0	0	0	0
ttbar	85	5.13829	0.680391	0.132416
Z	3192	221.04	10.8851	0.0492448
ZZ	286	1.67133	0.181815	0.108785
WZ	149	4.08664	0.520873	0.127458
WW	0	0	0	0
bkg:	3714	232.19		
HVTWZllqq500	13	15.3692		

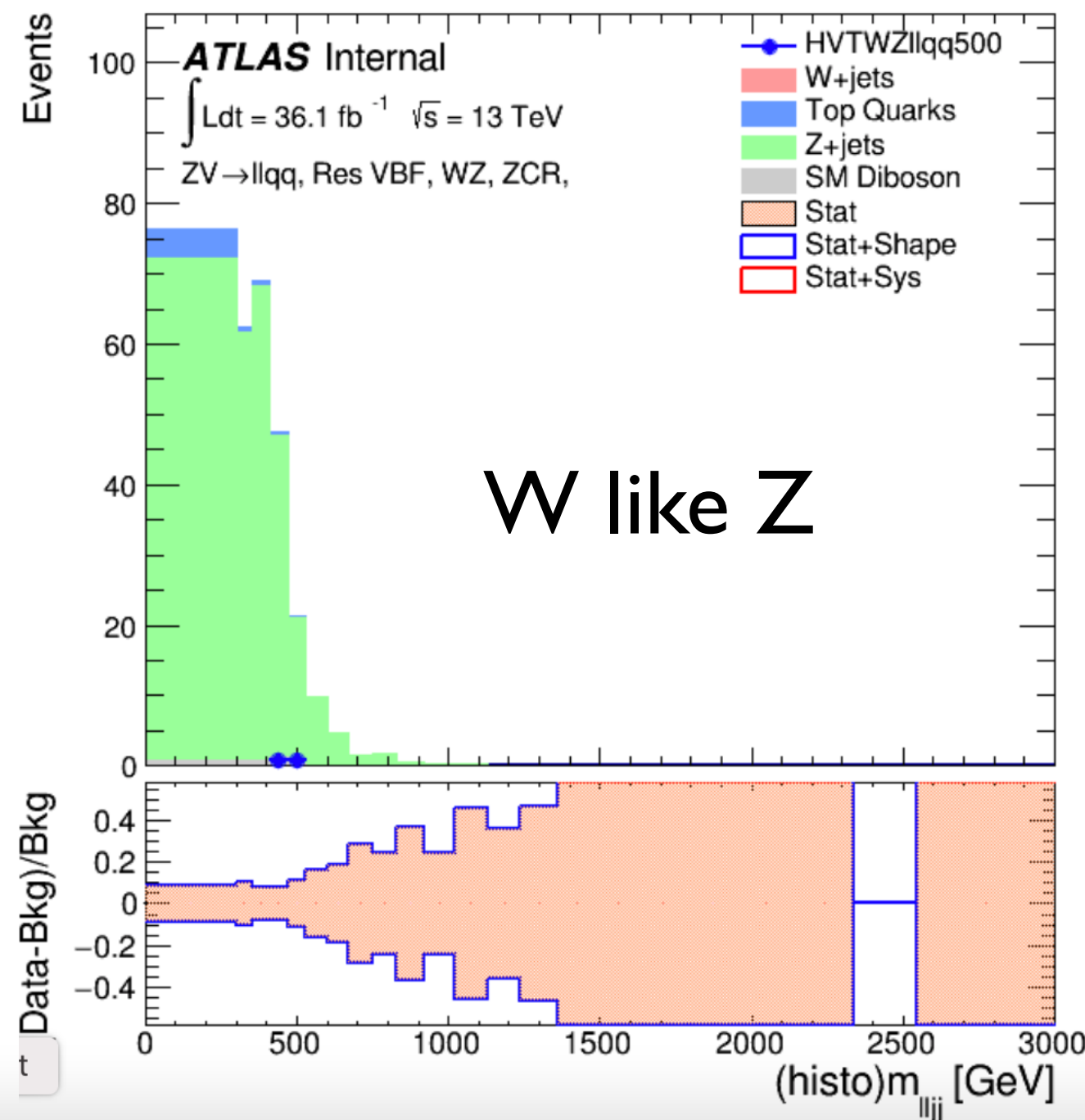
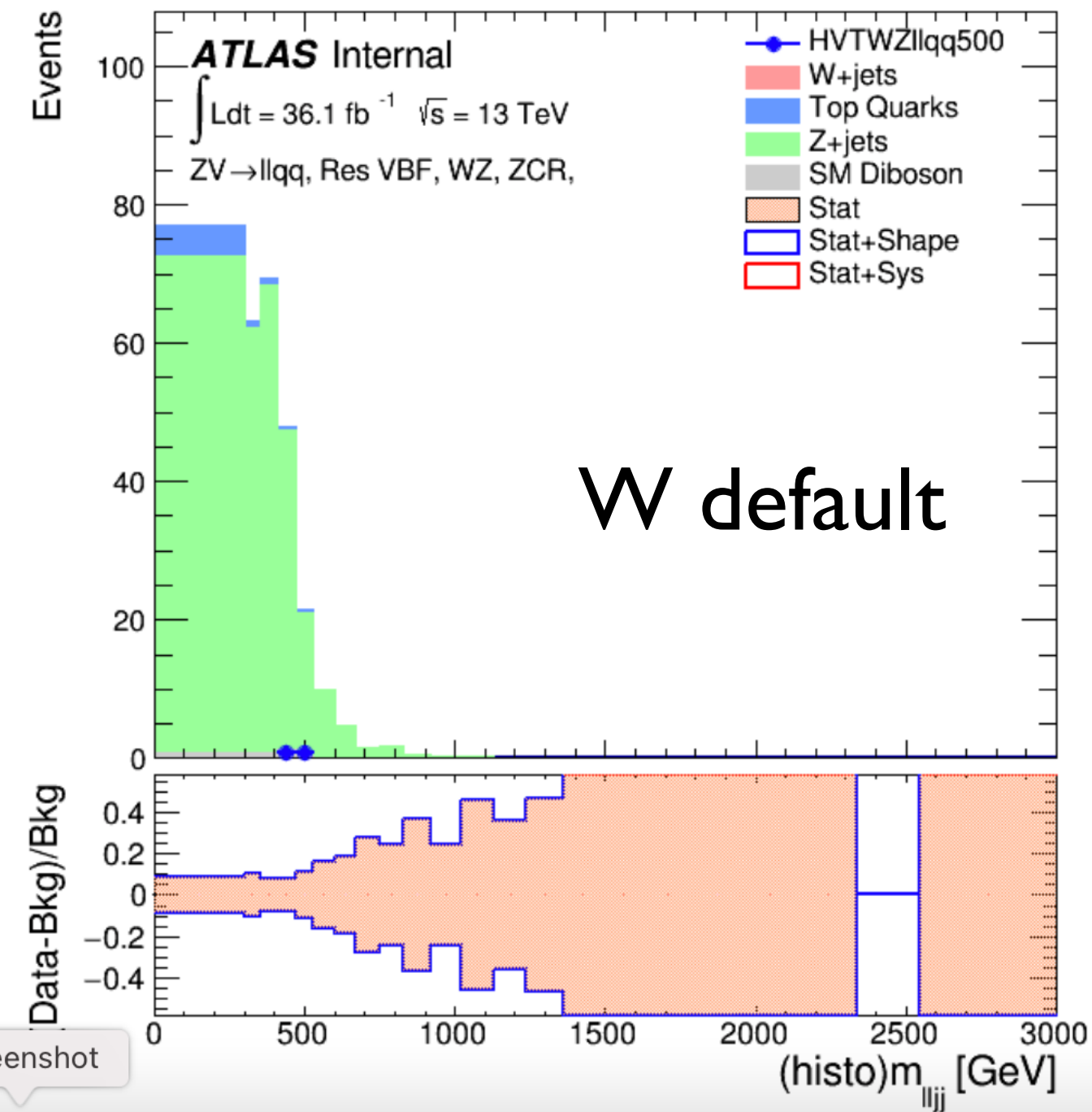
W default

sampleName	entries	integral	error	error/integ.
W	0	0	0	0
stopWt	2	0.253805	0.179609	0.707666
stopt	0	0	0	0
stops	0	0	0	0
ttbar	71	4.19602	0.610579	0.145514
Z	3138	219.347	10.88	0.0496017
ZZ	284	1.65957	0.181434	0.109326
WZ	147	3.98002	0.514994	0.129395
WW	0	0	0	0
bkg:	3642	229.436		
HVTWZllqq500	13	15.3692		

W like Z



Results: $ZW \rightarrow lqq$, Res_VBF_ZW_ZC



ZW->llqq, Res_VBF_ZW_ZC

sampleName	entries	integral	error	error/integ.
W	0	0	0	0
stopWt	1	0.140261	0.140261	1
stopt	1	0.0554932	0.0554932	1
stops	0	0	0	0
ttbar	120	7.03651	0.796996	0.113266
Z	4315	287.633	11.7884	0.0409842
ZZ	172	1.34364	0.155183	0.115494
WZ	79	2.86468	0.411505	0.143648
WW	0	0	0	0
bkg:	4688	299.074		
HVTWZ1lqq500	2	1.67123		

W default

sampleName	entries	integral	error	error/integ.
W	0	0	0	0
stopWt	1	0.140261	0.140261	1
stopt	1	0.0554932	0.0554932	1
stops	0	0	0	0
ttbar	112	6.4856	0.762742	0.117605
Z	4252	285.757	11.7822	0.0412314
ZZ	169	1.32909	0.1545	0.116244
WZ	79	2.86468	0.411505	0.143648
WW	0	0	0	0
bkg:	4614	296.632		
HVTWZ1lqq500	2	1.67123		

W like Z

