The LaTeX report

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Contents

1 Setup

1.1 Command history

```
ma5>
# set directory where running "./bin/ma5"; set lumi; define the signal significance
ma5>set main.currentdir = /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data
# need to change this directory path -> exit and type "pwd" to get the path
ma5>set main.lumi = 40
ma5>set main.fom.formula = 5
ma5>set main.fom.x = 0.0
ma5>
# import samples -> change the path to the LHE file
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/axion_signal/-
axion_signal_gurrola_cuts_1MeV.lhe.gz as signal
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_0_100_merged.lhe.gz as bg_vbf_0_100
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_100_200_merged.lhe.gz as bg_vbf_100_200
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_200_400_merged.lhe.gz as bg_vbf_200_400
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_400_600_merged.lhe.gz as bg_vbf_400_600
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_600_800_merged.lhe.gz as bg_vbf_600_800
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_800_1200_merged.lhe.gz as bg_vbf_800_1200
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_1200_1600_merged.lhe.gz as bg_vbf_1200_1600
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/vbf_diphoton_background_
merged_lhe/vbf_diphoton_background_ht_1600_inf_merged.lhe.gz as bg_vbf_1600_inf
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_0_100_merged.lhe.gz as bg_dip_0_100
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_100_200_merged.lhe.gz as bg_dip_100_200
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_200_400_merged.lhe.gz as bg_dip_200_400
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_400_600_merged.lhe.gz as bg_dip_400_600
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_600_800_merged.lhe.gz as bg_dip_600_800
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_800_1200_merged.lhe.gz as bg_dip_800_1200
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_1200_1600_merged.lhe.gz as bg_dip_1200_1600
ma5>import /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/madgraph_data/diphoton_double_isr_back
merged_lhe/diphoton_double_isr_background_ht_1600_inf_merged.lhe.gz as bg_dip_1600_inf
ma5>
# define bg and signal samples
ma5>set signal.type = signal
ma5>set bg_vbf_0_100.type = background
ma5>set bg_vbf_100_200.type = background
ma5>set bg_vbf_200_400.type = background
```

```
ma5>set bg_vbf_400_600.type = background
ma5>set bg_vbf_600_800.type = background
ma5>set bg_vbf_800_1200.type = background
ma5>set bg_vbf_1200_1600.type = background
ma5>set bg_vbf_1600_inf.type = background
ma5>set bg_dip_0_100.type = background
ma5>set bg_dip_100_200.type = background
ma5>set bg_dip_200_400.type = background
ma5>set bg_dip_400_600.type = background
ma5>set bg_dip_600_800.type = background
ma5>set bg_dip_800_1200.type = background
ma5>set bg_dip_1200_1600.type = background
ma5>set bg_dip_1600_inf.type = background
ma5># a jet can be from a light quark or b quark
ma5>define jets = j
ma5>define e = e+ e-
ma5>define mu = mu+ mu-
ma5>define ta = ta+ ta-
ma5>define lept = e mu ta
ma5>define ax = 9000005
ma5># cuts
ma5>select (sdETA(jets[1] jets[2]) > 3.6 or sdETA(jets[1] jets[2]) < -3.6) and M(jets[1]
jets[2]) > 1250
ma5># define which plots to make
ma5>plot PT(jets[1])
ma5>plot ETA(jets[1])
ma5>plot PHI(jets[1])
ma5>plot PT(jets[2])
ma5>plot ETA(jets[2])
ma5>plot PHI(jets[2])
ma5>plot DELTAR(jets[1], jets[2])
ma5>plot M(jets[1] jets[2])
ma5>plot sdETA(jets[1] jets[2])
ma5>plot M(a[1] a[2])
ma5>plot PT(a[1])
ma5>plot PT(a[2])
ma5>plot THT
ma5>plot MET
ma5>plot TET
ma5>#set the plot/graph parameters
ma5>set selection[2].xmin = 0
ma5>set selection[2].xmax = 2000
ma5>set selection[2].nbins = 200
ma5>set selection[2].rank = PTordering
ma5>set selection[2].titleX = "p_{T}[j_{1}] (GeV)"
ma5>set selection[3].xmin = -8
ma5>set selection[3].xmax = 8
ma5>set selection[3].nbins = 160
ma5>set selection[3].rank = PTordering
```

```
ma5>set selection[3].titleX = "#eta[j_{1}]"
ma5>set selection[4].xmin = -3.2
ma5>set selection[4].xmax = 3.2
ma5>set selection[4].nbins = 64
ma5>set selection[4].rank = PTordering
ma5>set selection[4].titleX = "#phi[j_{1}]"
ma5>set selection[5].xmin = 0
ma5>set selection[5].xmax = 1000
ma5>set selection[5].nbins = 100
ma5>set selection[5].rank = PTordering
ma5>set selection[5].titleX = "p_{T}[j_{2}] (GeV)"
ma5>set selection[6].xmin = -8
ma5>set selection[6].xmax = 8
ma5>set selection[6].nbins = 160
ma5>set selection[6].rank = PTordering
ma5>set selection[6].titleX = "#eta[j_{2}]"
ma5>set selection[7].xmin = -3.2
ma5>set selection[7].xmax = 3.2
ma5>set selection[7].nbins = 64
ma5>set selection[7].rank = PTordering
ma5>set selection[7].titleX = "#phi[j_{2}]"
ma5>set selection[8].xmin = 0
ma5>set selection[8].xmax = 15
ma5>set selection[8].nbins = 75
ma5>set selection[8].rank = PTordering
ma5>set selection[8].titleX = "#DeltaR[j_{1},j_{2}]"
ma5>set selection[9].xmin = 0
ma5>set selection[9].xmax = 8000
ma5>set selection[9].nbins = 160
ma5>set selection[9].rank = PTordering
ma5>set selection[9].titleX = "M[j_{1},j_{2}] (GeV)"
ma5>set selection[10].xmin = -15
ma5>set selection[10].xmax = 15
ma5>set selection[10].titleX = "#Delta#eta(j_{1},j_{2})"
ma5>set selection[11].xmin = 0
ma5>set selection[11].xmax = 4000
ma5>set selection[11].nbins = 400
ma5>set selection[11].rank = PTordering
ma5>set selection[11].titleX = "M[a_{1},a_{2}] (GeV)"
ma5>set selection[12].xmin = 0
ma5>set selection[12].xmax = 2000
ma5>set selection[12].nbins = 80
ma5>set selection[12].rank = PTordering
ma5>set selection[12].titleX = "p_{T}[a_{1}]"
ma5>set selection[13].xmin = 0
ma5>set selection[13].xmax = 2000
ma5>set selection[13].nbins = 400
ma5>set selection[13].rank = PTordering
ma5>set selection[13].titleX = "p_{T}[a_{2}] (GeV)"
```

```
ma5>set selection[14].xmin = 0
ma5>set selection[14].xmax = 4000
ma5>set selection[14].nbins = 80
ma5>set selection[14].rank = PTordering
ma5>set selection[14].titleX = "THT"
ma5>set selection[15].xmin = 0
ma5>set selection[15].xmax = 1000
ma5>set selection[15].nbins = 200
ma5>set selection[15].rank = PTordering
ma5>set selection[15].titleX = "MET"
ma5>set selection[16].xmin = 0
ma5>set selection[16].xmax = 8000
ma5>set selection[16].nbins = 80
ma5>set selection[16].rank = PTordering
ma5>set selection[16].titleX = "TET"
ma5>submit tight_analysis_sdeta_2.6_mjj_1250
```

1.2 Configuration

- MadAnalysis version 1.6.33 (2017/11/20).
- Histograms given for an integrated luminosity of 40.0fb^{-1}.

2 Datasets

2.1 signal

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: signal events.
- Generated events: 1000000 events.
- Normalization to the luminosity: 4094+/- 2 events.
- Ratio (event weight): 0.0041 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/-madgraph_data/axion_signal/-axion_signal_gurrola_cuts_1MeV.ll	1000000	0.102 @ 0.028%	0.0

2.2 bg_vbf_0_100

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1000000 events.
- Normalization to the luminosity: 12150+/- 24 events.
- Ratio (event weight): 0.012 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_0_1(	1000000	0.304 @ 0.19%	0.0

2.3 bg_vbf_100_200

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 965662 events.

- Normalization to the luminosity: 9695+/- 17 events.
- Ratio (event weight): 0.01 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_100_	965662	0.242 @ 0.17%	0.0

2.4 bg_vbf_200_400

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 984165 events.
- Normalization to the luminosity: 5413+/- 11 events.
- Ratio (event weight): 0.0055 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_200_	984165	0.135 @ 0.2%	0.0

2.5 bg_vbf_400_600

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1000000 events.
- Normalization to the luminosity: 986+/- 2 events.
- Ratio (event weight): 0.00099 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_400_	1000000	0.0247 @ 0.14%	0.0

2.6 bg_vbf_600_800

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1000000 events.
- Normalization to the luminosity: 252+/- 1 events.
- Ratio (event weight): 0.00025 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_600_	1000000	0.0063 @ 0.13%	0.0

2.7 bg_vbf_800_1200

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 400839 events.
- Normalization to the luminosity: 114+/- 1 events.
- Ratio (event weight): 0.00028 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_800_	400839	0.00287 @ 0.16%	0.0

2.8 bg_vbf_1200_1600

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 953803 events.
- Normalization to the luminosity: 20+/- 1 events.
- Ratio (event weight): 2.1e-05 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_1200	953803	0.000515 @ 0.16%	0.0

2.9 bg_vbf_1600_inf

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 270148 events.
- Normalization to the luminosity: 7+/- 1 events.
- Ratio (event weight): 2.6e-05 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-vbf_diphoton_background_data/-merged_lhe/-vbf_diphoton_background_ht_1600	270148	0.000191 @ 0.11%	0.0

2.10 bg_dip_0_100

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1040000 events.
- Normalization to the luminosity: 2710847+/- 4614 events.

- Ratio (event weight): 2.6 - warning: please generate more events (weight larger than 1)!

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_ merged_lhe/-diphoton_double_isr_background_l	1040000	67.8 @ 0.17%	0.0

2.11 bg_dip_100_200

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1040000 events.
- Normalization to the luminosity: 1095362+/- 1528 events.
- Ratio (event weight): 1.1 - warning: please generate more events (weight larger than 1)!

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_ merged_lhe/-diphoton_double_isr_background_l	1040000	27.4 @ 0.14%	0.0

2.12 bg_dip_200_400

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1040000 events.
- Normalization to the luminosity: 239548+/- 414 events.
- Ratio (event weight): 0.23 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_ merged_lhe/-diphoton_double_isr_background_l	1040000	5.99 @ 0.17%	0.0

2.13 bg_dip_400_600

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1040000 events.
- Normalization to the luminosity: 28798+/- 53 events.
- Ratio (event weight): 0.028 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_merged_lhe/-diphoton_double_isr_background_l	1040000	0.72 @ 0.18%	0.0

2.14 bg_dip_600_800

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 662009 events.
- Normalization to the luminosity: 6674+/- 28 events.
- Ratio (event weight): 0.01 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_merged_lhe/-diphoton_double_isr_background_l	662009	0.167 @ 0.41%	0.0

2.15 bg_dip_800_1200

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1040000 events.
- Normalization to the luminosity: 2942+/- 6 events.

- Ratio (event weight): 0.0028 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_c merged_lhe/-diphoton_double_isr_background_l	1040000	0.0736 @ 0.17%	0.0

2.16 bg_dip_1200_1600

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 337115 events.
- Normalization to the luminosity: 513+/- 3 events.
- Ratio (event weight): 0.0015 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_c merged_lhe/-diphoton_double_isr_background_l	337115	0.0128 @ 0.51%	0.0

2.17 bg_dip_1600_inf

- Samples stored in the directory: /Users/elijahsheridan/MG5_aMC_v2_6_5/axion_pheno/-optimization/ma_scripts .
- Sample consisting of: background events.
- Generated events: 1040000 events.
- Normalization to the luminosity: 187+/- 1 events.
- Ratio (event weight): 0.00018 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
/Users/elijahsheridan/-MG5_aMC_v2_6_5/-axion_pheno/madgraph_data/-diphoton_double_isr_background_c merged_lhe/-diphoton_double_isr_background_l	1040000	0.00469 @ 0.15%	0.0

3 Histos and cuts

3.1 Cut 1

*** Cut: select (sdETA (jets[1] jets[2]) > 3.6 or sdETA (jets[1] jets[2]) < -3.6) and M (jets[1] jets[2]) > 1250.0**

Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
signal	814.6 +/- 25.5	3279.5 +/- 25.6	0.19896 +/- 0.00624	0.19896 +/- 0.00624
bg_vbf_0_10	204.2 +/- 14.2	11946.1 +/- 26.8	0.01681 +/- 0.00117	0.01681 +/- 0.00117
bg_vbf_100_	950.9 +/- 29.3	8744.4 +/- 32.9	0.09808 +/- 0.00302	0.09808 +/- 0.00302
bg_vbf_200_	1147.9 +/- 30.2	4265.4 +/- 31.3	0.21205 +/- 0.00556	0.21205 +/- 0.00556
bg_vbf_400_	273.7 +/- 14.1	713.1 +/- 14.1	0.2774 +/- 0.0143	0.2774 +/- 0.0143
bg_vbf_600_	47.78 +/- 6.22	204.30 +/- 6.23	0.1895 +/- 0.0247	0.1895 +/- 0.0247
bg_vbf_800_	12.06 +/- 3.29	102.70 +/- 3.29	0.1051 +/- 0.0286	0.1051 +/- 0.0286
bg_vbf_1200_	0.678 +/- 0.810	19.92 +/- 0.81	0.0329 +/- 0.0393	0.0329 +/- 0.0393
bg_vbf_1600_	0.0483 +/- 0.2191	7.610 +/- 0.219	0.00631 +/- 0.02860	0.00631 +/- 0.02860
bg_dip_0_10	229.4 +/- 15.1	2710617 +/- 4612	8.46e-05 +/- 5.59e-06	8.46e-05 +/- 5.59e-06
bg_dip_100_	990.1 +/- 31.5	1094372 +/- 1526	9.04e-04 +/- 2.87e-05	9.04e-04 +/- 2.87e-05
bg_dip_200_	1641.8 +/- 40.5	237907 +/- 412	0.006854 +/- 0.000169	0.006854 +/- 0.000169
bg_dip_400_	593.2 +/- 24.1	28205.5 +/- 56.5	0.020599 +/- 0.000837	0.020599 +/- 0.000837
bg_dip_600_	88.41 +/- 9.35	6585.9 +/- 28.8	0.0132 +/- 0.0014	0.0132 +/- 0.0014
bg_dip_800_	22.00 +/- 4.67	2920.34 +/- 6.86	0.00748 +/- 0.00159	0.00748 +/- 0.00159
bg_dip_1200_	1.34 +/- 1.16	512.16 +/- 2.87	0.00261 +/- 0.00225	0.00261 +/- 0.00225
bg_dip_1600_	0.0921 +/- 0.3034	187.691 +/- 0.412	0.00049 +/- 0.00162	0.00049 +/- 0.00162

3.2 Histogram 1

*** Plot: PT (jets[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	389.028	279.3	0.0	0.08595
bg_vbf_0_100	204	1.0	47.8851	10.41	0.0	0.0
bg_vbf_100_20	950	1.0	89.1176	20.25	0.0	0.0
bg_vbf_200_40	1147	1.0	164.604	39.1	0.0	0.0
bg_vbf_400_60	273	1.0	275.129	52.5	0.0	0.0
bg_vbf_600_80	47.8	1.0	393.923	73.72	0.0	0.0
bg_vbf_800_12	12.1	1.0	532.692	113.8	0.0	0.0
bg_vbf_1200_1	0.679	1.0	768.802	172.9	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	1041.94	295.3	0.0	1.326
bg_dip_0_100	229	1.0	49.299	10.59	0.0	0.0
bg_dip_100_20	990	1.0	91.6835	23.0	0.0	0.0
bg_dip_200_40	1641	1.0	171.76	41.63	0.0	0.0
bg_dip_400_60	593	1.0	271.988	55.43	0.0	0.0
bg_dip_600_80	88.4	1.0	393.827	83.72	0.0	0.0
bg_dip_800_12	22.0	1.0	541.847	140.2	0.0	0.0
bg_dip_1200_1	1.34	1.0	771.586	200.9	0.0	0.0
bg_dip_1600_i	0.0921	1.0	1050.55	335.8	0.0	1.962

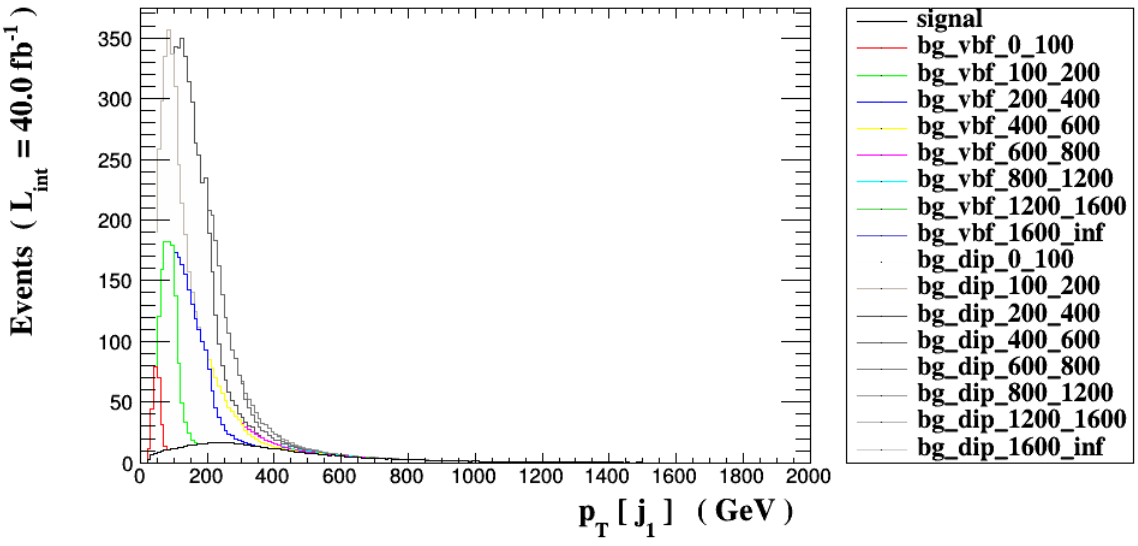

Figure 1.

3.3 Histogram 2

*** Plot: ETA (jets[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	-0.00967881	2.128	0.0	0.0
bg_vbf_0_100	204	1.0	0.0255299	3.764	0.0	0.0
bg_vbf_100_20	950	1.0	0.0172509	3.146	0.0	0.0
bg_vbf_200_40	1147	1.0	-0.00174525	2.593	0.0	0.0
bg_vbf_400_60	273	1.0	-0.00051233	2.172	0.0	0.0
bg_vbf_600_80	47.8	1.0	-0.00169511	2.039	0.0	0.0
bg_vbf_800_12	12.1	1.0	0.00200489	1.945	0.0	0.0
bg_vbf_1200_1	0.679	1.0	-0.0111172	1.839	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	0.0402739	1.757	0.0	0.0
bg_dip_0_100	229	1.0	0.198023	3.598	0.0	0.0
bg_dip_100_20	990	1.0	0.0777096	3.122	0.0	0.0
bg_dip_200_40	1641	1.0	-0.0337468	2.545	0.0	0.0
bg_dip_400_60	593	1.0	-0.0244526	2.14	0.0	0.0
bg_dip_600_80	88.4	1.0	0.0261966	2.016	0.0	0.0
bg_dip_800_12	22.0	1.0	-0.0220879	1.913	0.0	0.0
bg_dip_1200_1	1.34	1.0	0.0111076	1.818	0.0	0.0
bg_dip_1600_i	0.0921	1.0	-0.103337	1.731	0.0	0.0

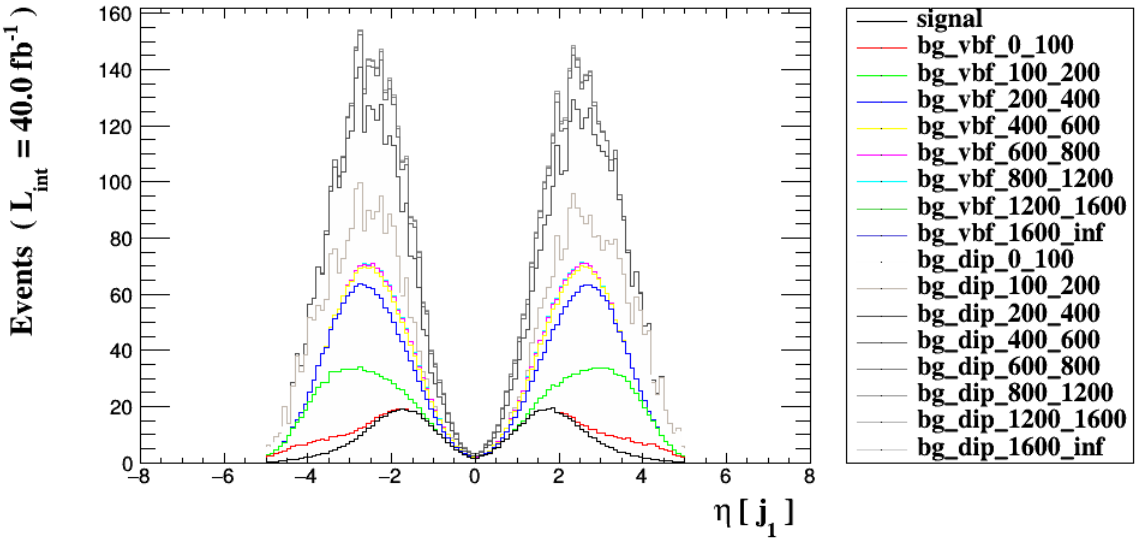

Figure 2.

3.4 Histogram 3

*** Plot: PHI (jets[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	-0.00225724	1.813	0.0	0.0
bg_vbf_0_100	204	1.0	0.0127227	1.804	0.0	0.0
bg_vbf_100_20	950	1.0	-0.00612524	1.816	0.0	0.0
bg_vbf_200_40	1147	1.0	0.00165979	1.815	0.0	0.0
bg_vbf_400_60	273	1.0	-0.00505826	1.814	0.0	0.0
bg_vbf_600_80	47.8	1.0	0.00354342	1.811	0.0	0.0
bg_vbf_800_12	12.1	1.0	-0.00493601	1.811	0.0	0.0
bg_vbf_1200_1	0.679	1.0	0.0253302	1.81	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	-0.0499347	1.794	0.0	0.0
bg_dip_0_100	229	1.0	0.0706185	1.855	0.0	0.0
bg_dip_100_20	990	1.0	0.0130569	1.802	0.0	0.0
bg_dip_200_40	1641	1.0	-0.00350058	1.814	0.0	0.0
bg_dip_400_60	593	1.0	-0.00755272	1.811	0.0	0.0
bg_dip_600_80	88.4	1.0	-0.0246404	1.811	0.0	0.0
bg_dip_800_12	22.0	1.0	0.0122033	1.82	0.0	0.0
bg_dip_1200_1	1.34	1.0	-0.106644	1.776	0.0	0.0
bg_dip_1600_i	0.0921	1.0	0.0394614	1.794	0.0	0.0

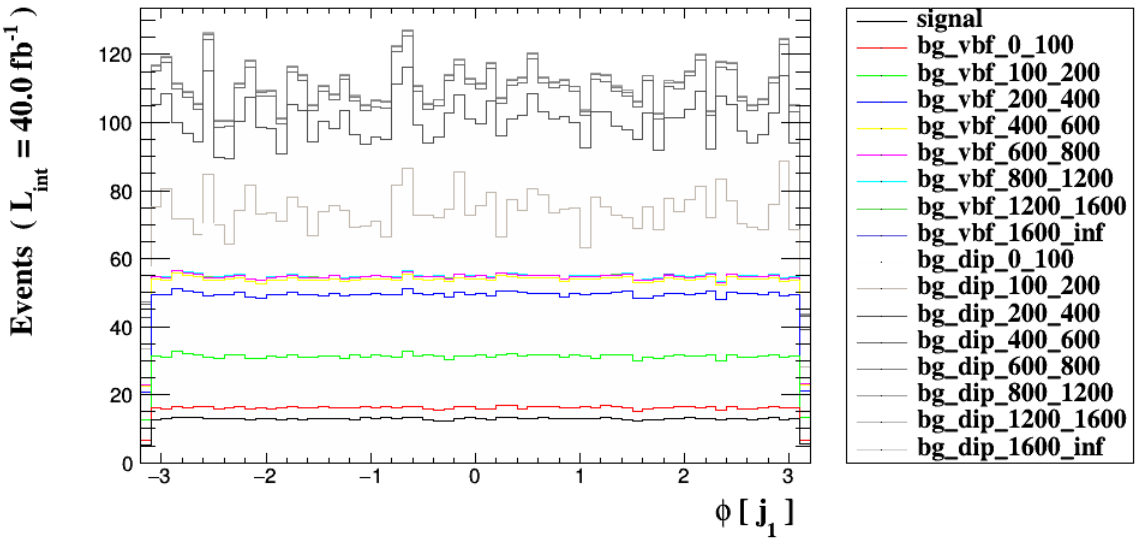

Figure 3.

3.5 Histogram 4

*** Plot: PT (jets[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	118.857	83.88	0.0	0.0
bg_vbf_0_100	204	1.0	32.1623	7.242	0.0	0.0
bg_vbf_100_20	950	1.0	59.3867	16.82	0.0	0.0
bg_vbf_200_40	1147	1.0	115.434	33.16	0.0	0.0
bg_vbf_400_60	273	1.0	195.659	46.99	0.0	0.0
bg_vbf_600_80	47.8	1.0	279.784	70.44	0.0	0.0
bg_vbf_800_12	12.1	1.0	380.768	107.3	0.0	0.0
bg_vbf_1200_1	0.679	1.0	548.381	167.1	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	704.574	259.1	0.0	2.477
bg_dip_0_100	229	1.0	31.8991	6.401	0.0	0.0
bg_dip_100_20	990	1.0	57.6486	17.6	0.0	0.0
bg_dip_200_40	1641	1.0	119.557	36.98	0.0	0.0
bg_dip_400_60	593	1.0	196.486	49.41	0.0	0.0
bg_dip_600_80	88.4	1.0	278.131	80.76	0.0	0.0
bg_dip_800_12	22.0	1.0	371.192	132.9	0.0	0.0
bg_dip_1200_1	1.34	1.0	545.716	190.7	0.0	0.0
bg_dip_1600_i	0.0921	1.0	701.989	296.7	0.0	3.728

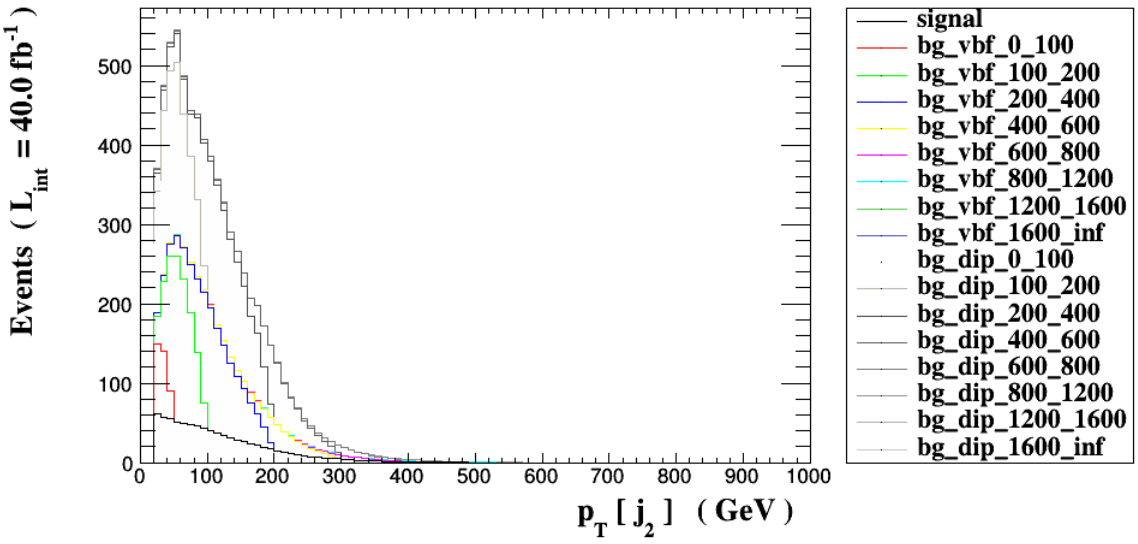

Figure 4.

3.6 Histogram 5

*** Plot: ETA (jets[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	0.0152093	3.12	0.0	0.0
bg_vbf_0_100	204	1.0	-0.0350942	3.93	0.0	0.0
bg_vbf_100_20	950	1.0	-0.01618	3.43	0.0	0.0
bg_vbf_200_40	1147	1.0	5.76943e-05	2.866	0.0	0.0
bg_vbf_400_60	273	1.0	0.00171816	2.447	0.0	0.0
bg_vbf_600_80	47.8	1.0	0.00640901	2.34	0.0	0.0
bg_vbf_800_12	12.1	1.0	-0.000705382	2.258	0.0	0.0
bg_vbf_1200_1	0.679	1.0	0.0225479	2.202	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	-0.0471165	2.218	0.0	0.0
bg_dip_0_100	229	1.0	-0.00249304	3.869	0.0	0.0
bg_dip_100_20	990	1.0	0.0777798	3.283	0.0	0.0
bg_dip_200_40	1641	1.0	0.00708046	2.574	0.0	0.0
bg_dip_400_60	593	1.0	0.0267315	2.208	0.0	0.0
bg_dip_600_80	88.4	1.0	-0.00762965	2.217	0.0	0.0
bg_dip_800_12	22.0	1.0	0.0170356	2.257	0.0	0.0
bg_dip_1200_1	1.34	1.0	-0.0195015	2.219	0.0	0.0
bg_dip_1600_i	0.0921	1.0	0.0934627	2.293	0.0	0.0

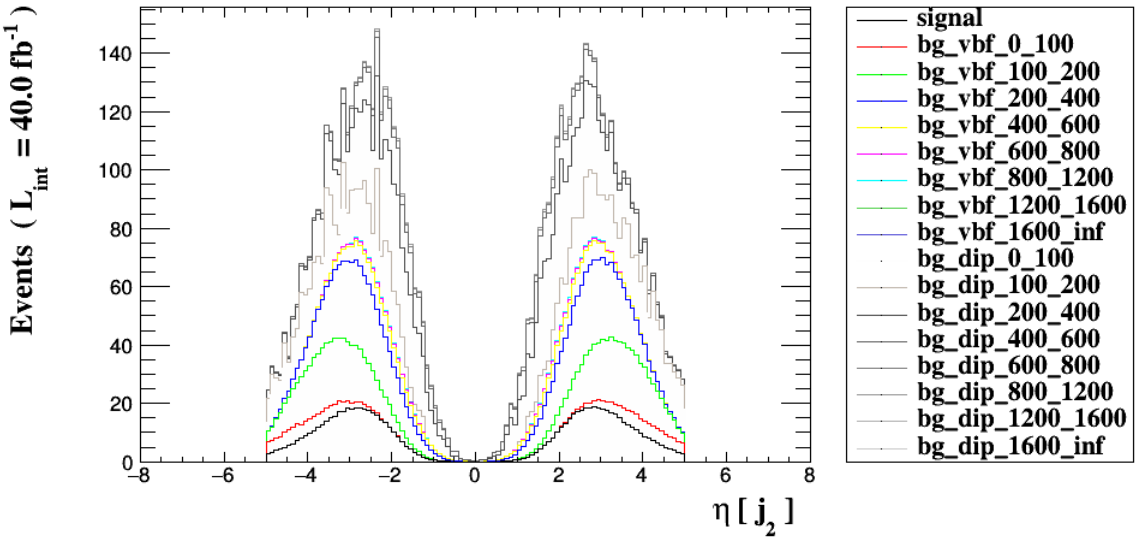

Figure 5.

3.7 Histogram 6

*** Plot: PHI (jets[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	-0.00265541	1.816	0.0	0.0
bg_vbf_0_100	204	1.0	-0.0174788	1.811	0.0	0.0
bg_vbf_100_20	950	1.0	0.00838798	1.816	0.0	0.0
bg_vbf_200_40	1147	1.0	-0.00494322	1.813	0.0	0.0
bg_vbf_400_60	273	1.0	-0.00128938	1.814	0.0	0.0
bg_vbf_600_80	47.8	1.0	-0.000172601	1.816	0.0	0.0
bg_vbf_800_12	12.1	1.0	-0.00988736	1.818	0.0	0.0
bg_vbf_1200_1	0.679	1.0	-0.0114172	1.817	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	0.0776779	1.82	0.0	0.0
bg_dip_0_100	229	1.0	-0.125013	1.693	0.0	0.0
bg_dip_100_20	990	1.0	0.000160922	1.83	0.0	0.0
bg_dip_200_40	1641	1.0	-0.00751175	1.822	0.0	0.0
bg_dip_400_60	593	1.0	-0.0146617	1.819	0.0	0.0
bg_dip_600_80	88.4	1.0	-0.0053832	1.817	0.0	0.0
bg_dip_800_12	22.0	1.0	0.0183776	1.811	0.0	0.0
bg_dip_1200_1	1.34	1.0	-0.0165893	1.844	0.0	0.0
bg_dip_1600_i	0.0921	1.0	-0.156297	1.818	0.0	0.0

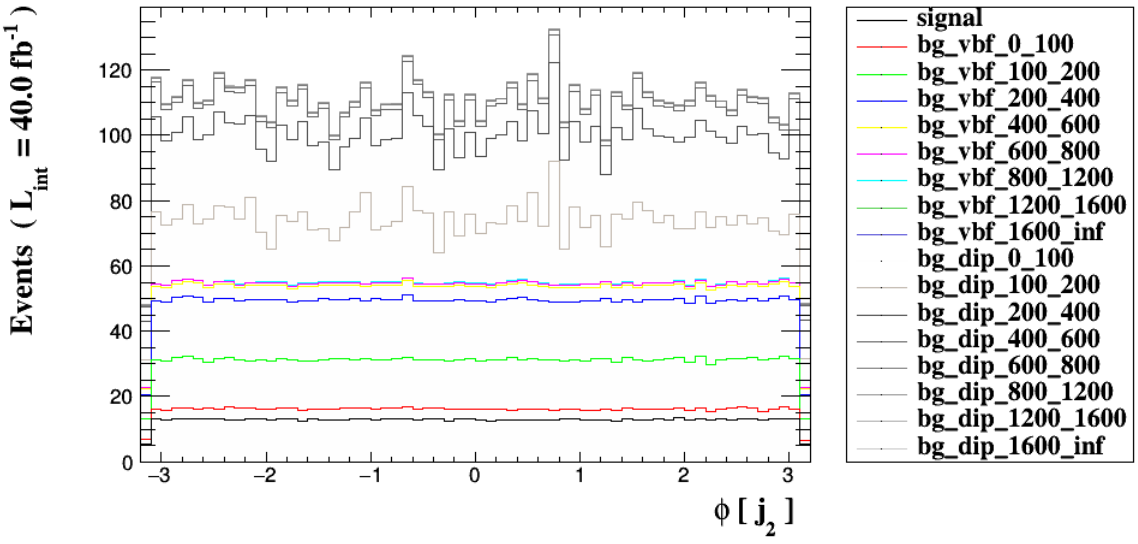

Figure 6.

3.8 Histogram 7

*** Plot: DELTAR (jets[1] , jets[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	5.27759	1.112	0.0	0.0
bg_vbf_0_100	204	1.0	7.94905	0.5894	0.0	0.0
bg_vbf_100_20	950	1.0	6.92988	0.6153	0.0	0.0
bg_vbf_200_40	1147	1.0	5.94241	0.6428	0.0	0.0
bg_vbf_400_60	273	1.0	5.24254	0.5403	0.0	0.0
bg_vbf_600_80	47.8	1.0	5.09112	0.4491	0.0	0.0
bg_vbf_800_12	12.1	1.0	4.98442	0.3749	0.0	0.0
bg_vbf_1200_1	0.679	1.0	4.88083	0.3024	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	4.81965	0.278	0.0	0.0
bg_dip_0_100	229	1.0	7.70361	0.3668	0.0	0.0
bg_dip_100_20	990	1.0	6.66956	0.4741	0.0	0.0
bg_dip_200_40	1641	1.0	5.59422	0.4888	0.0	0.0
bg_dip_400_60	593	1.0	5.01429	0.3717	0.0	0.0
bg_dip_600_80	88.4	1.0	4.95429	0.3337	0.0	0.0
bg_dip_800_12	22.0	1.0	4.90794	0.3132	0.0	0.0
bg_dip_1200_1	1.34	1.0	4.83313	0.2797	0.0	0.0
bg_dip_1600_i	0.0921	1.0	4.80521	0.266	0.0	0.0

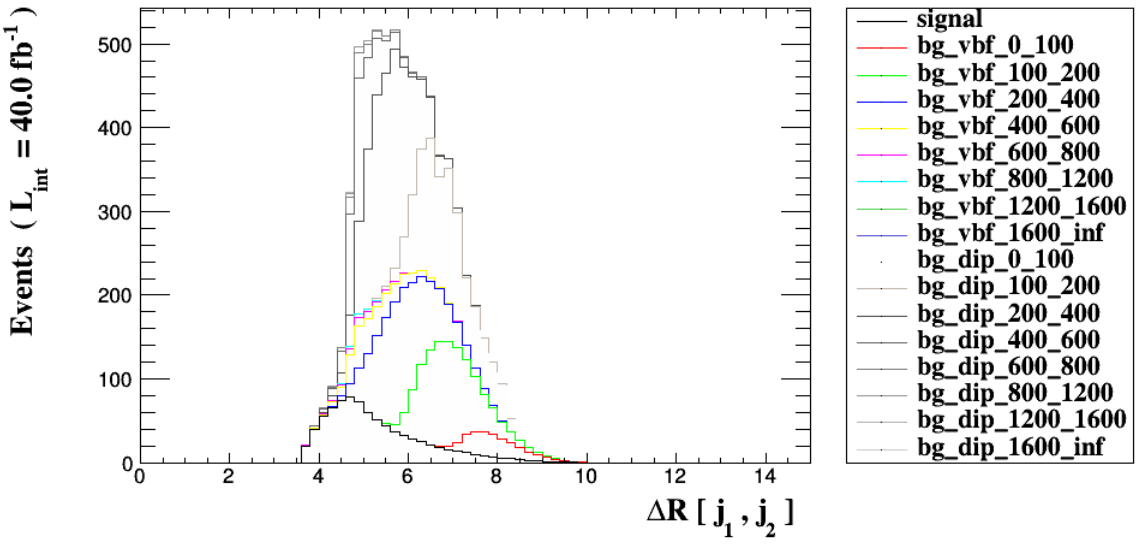

Figure 7.

3.9 Histogram 8

*** Plot: M (jets[1] jets[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	2095.08	735.5	0.0	0.0
bg_vbf_0_100	204	1.0	1750.26	539.1	0.0	0.0
bg_vbf_100_20	950	1.0	1794.82	579.5	0.0	0.0
bg_vbf_200_40	1147	1.0	1934.25	656.0	0.0	0.001439
bg_vbf_400_60	273	1.0	2181.11	739.8	0.0	0.002163
bg_vbf_600_80	47.8	1.0	2780.95	761.3	0.0	0.007383
bg_vbf_800_12	12.1	1.0	3449.42	798.4	0.0	0.02372
bg_vbf_1200_1	0.679	1.0	4531.41	878.7	0.0	0.08585
bg_vbf_1600_i	0.0492	1.0	5565.17	1177	0.0	1.325
bg_dip_0_100	229	1.0	1492.0	232.6	0.0	0.0
bg_dip_100_20	990	1.0	1516.34	292.6	0.0	0.0
bg_dip_200_40	1641	1.0	1567.0	332.1	0.0	0.0
bg_dip_400_60	593	1.0	1796.13	423.3	0.0	0.0
bg_dip_600_80	88.4	1.0	2429.3	531.0	0.0	0.0
bg_dip_800_12	22.0	1.0	3111.37	729.7	0.0	0.0
bg_dip_1200_1	1.34	1.0	4235.93	940.6	0.0	0.0
bg_dip_1600_i	0.0921	1.0	5258.35	1427	0.0	0.1965

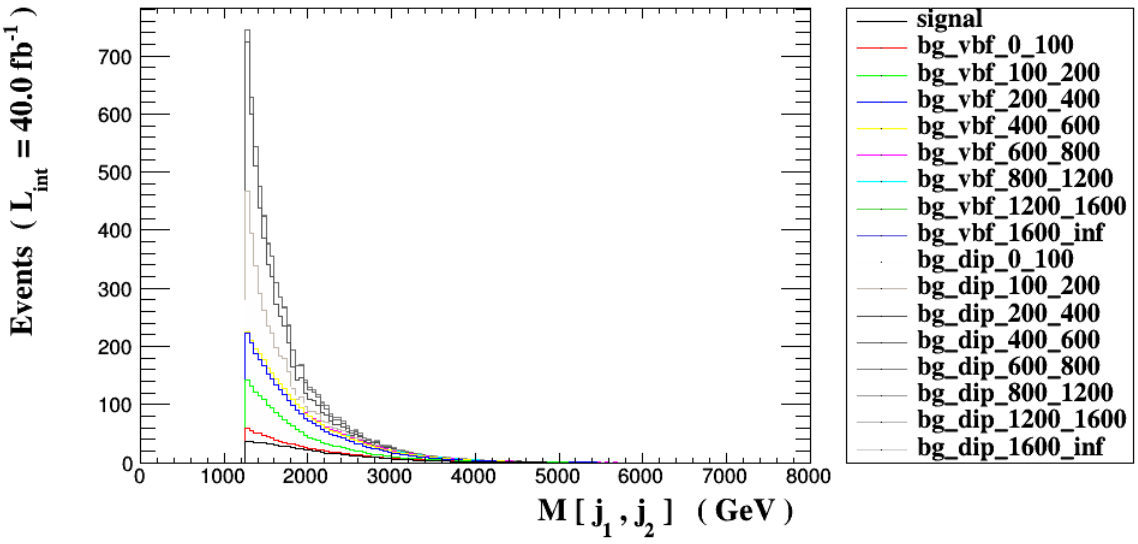

Figure 8.

3.10 Histogram 9

*** Plot: sdETA (jets[1] jets[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	-0.0248882	5.074	0.0	0.0
bg_vbf_0_100	204	1.0	0.0606241	7.595	0.0	0.0
bg_vbf_100_20	950	1.0	0.0334309	6.433	0.0	0.0
bg_vbf_200_40	1147	1.0	-0.00180295	5.3	0.0	0.0
bg_vbf_400_60	273	1.0	-0.00223049	4.457	0.0	0.0
bg_vbf_600_80	47.8	1.0	-0.00810412	4.25	0.0	0.0
bg_vbf_800_12	12.1	1.0	0.00271027	4.095	0.0	0.0
bg_vbf_1200_1	0.679	1.0	-0.0336651	3.941	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	0.0873904	3.857	0.0	0.0
bg_dip_0_100	229	1.0	0.200516	7.284	0.0	0.0
bg_dip_100_20	990	1.0	-7.00843e-05	6.146	0.0	0.0
bg_dip_200_40	1641	1.0	-0.0408273	4.854	0.0	0.0
bg_dip_400_60	593	1.0	-0.0511841	4.11	0.0	0.0
bg_dip_600_80	88.4	1.0	0.0338263	4.03	0.0	0.0
bg_dip_800_12	22.0	1.0	-0.0391235	3.972	0.0	0.0
bg_dip_1200_1	1.34	1.0	0.030609	3.865	0.0	0.0
bg_dip_1600_i	0.0921	1.0	-0.1968	3.825	0.0	0.0

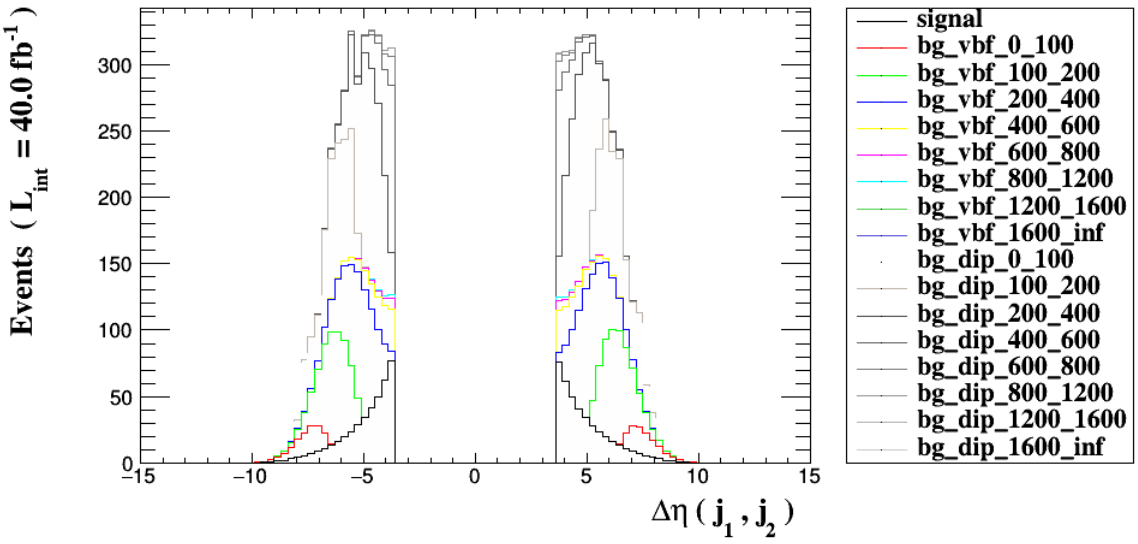

Figure 9.

3.11 Histogram 10

*** Plot: M (a[1] a[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	1032.45	769.1	0.0	0.5343
bg_vbf_0_100	204	1.0	74.0504	63.82	0.0	0.0
bg_vbf_100_20	950	1.0	89.0692	83.23	0.0	0.0
bg_vbf_200_40	1147	1.0	113.126	112.7	0.0	0.0
bg_vbf_400_60	273	1.0	139.717	143.9	0.0	0.0
bg_vbf_600_80	47.8	1.0	165.787	176.9	0.0	0.0
bg_vbf_800_12	12.1	1.0	185.038	200.9	0.0	0.0
bg_vbf_1200_1	0.679	1.0	213.384	242.7	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	253.626	304.0	0.0	0.0
bg_dip_0_100	229	1.0	60.9776	49.6	0.0	0.0
bg_dip_100_20	990	1.0	85.5064	91.83	0.0	0.0
bg_dip_200_40	1641	1.0	103.465	123.5	0.0	0.0
bg_dip_400_60	593	1.0	127.966	153.3	0.0	0.0
bg_dip_600_80	88.4	1.0	162.699	196.4	0.0	0.0
bg_dip_800_12	22.0	1.0	194.991	235.3	0.0	0.0
bg_dip_1200_1	1.34	1.0	228.683	295.1	0.0	0.0
bg_dip_1600_i	0.0921	1.0	265.117	303.0	0.0	0.0

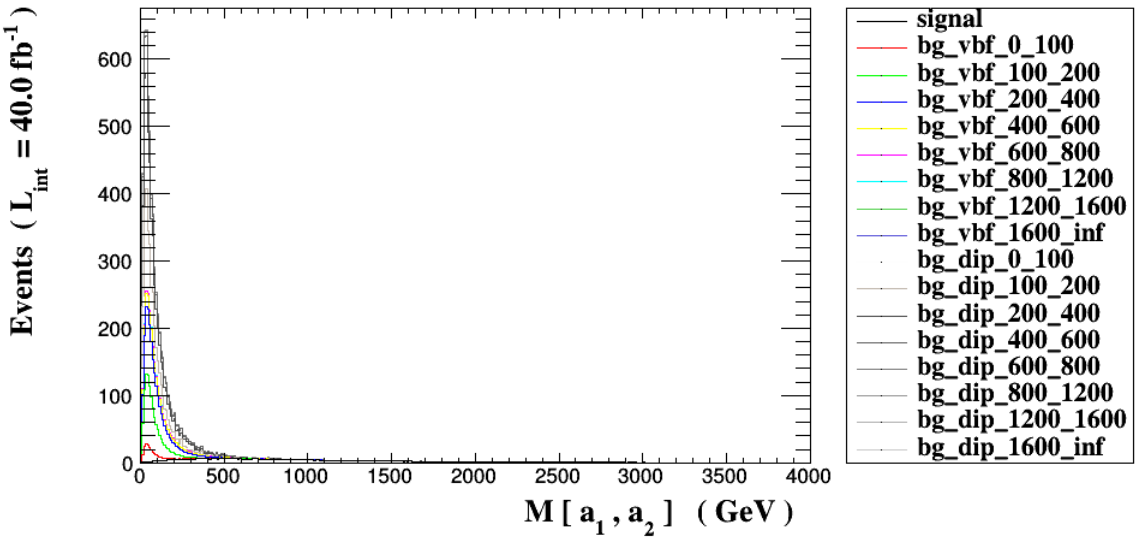

Figure 10.

3.12 Histogram 11

*** Plot: PT (a[1])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	592.022	364.9	0.0	0.4725
bg_vbf_0_100	204	1.0	37.4145	21.35	0.0	0.0
bg_vbf_100_20	950	1.0	51.5705	34.51	0.0	0.0
bg_vbf_200_40	1147	1.0	79.1223	64.44	0.0	0.0
bg_vbf_400_60	273	1.0	120.244	110.5	0.0	0.0
bg_vbf_600_80	47.8	1.0	162.906	163.7	0.0	0.0
bg_vbf_800_12	12.1	1.0	206.561	231.4	0.0	0.0
bg_vbf_1200_1	0.679	1.0	278.98	354.4	0.0	0.006346
bg_vbf_1600_i	0.0492	1.0	400.528	555.0	0.0	1.153
bg_dip_0_100	229	1.0	37.194	24.39	0.0	0.0
bg_dip_100_20	990	1.0	58.3072	44.9	0.0	0.0
bg_dip_200_40	1641	1.0	76.4723	72.86	0.0	0.0
bg_dip_400_60	593	1.0	101.934	111.1	0.0	0.0
bg_dip_600_80	88.4	1.0	146.62	175.7	0.0	0.0
bg_dip_800_12	22.0	1.0	203.629	274.7	0.0	0.0
bg_dip_1200_1	1.34	1.0	260.255	404.5	0.0	0.0
bg_dip_1600_i	0.0921	1.0	379.399	620.6	0.0	2.551

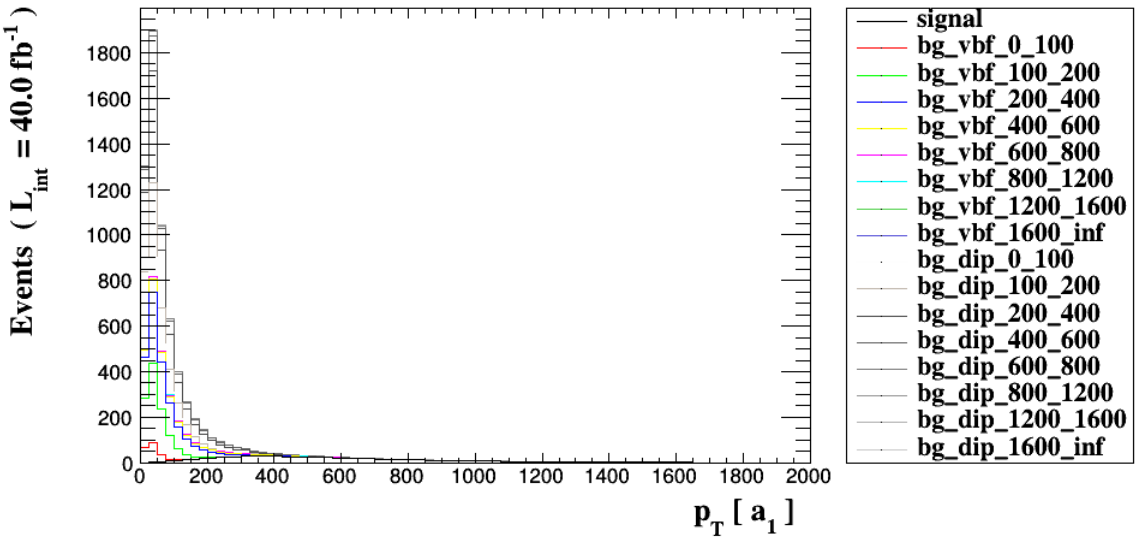

Figure 11.

3.13 Histogram 12

*** Plot: PT (a[2])**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	361.908	311.0	0.0	0.1764
bg_vbf_0_100	204	1.0	19.8396	12.78	0.0	0.0
bg_vbf_100_20	950	1.0	23.2752	18.44	0.0	0.0
bg_vbf_200_40	1147	1.0	27.9759	25.71	0.0	0.0
bg_vbf_400_60	273	1.0	33.8173	35.54	0.0	0.0
bg_vbf_600_80	47.8	1.0	38.9253	45.09	0.0	0.0
bg_vbf_800_12	12.1	1.0	42.1946	52.58	0.0	0.0
bg_vbf_1200_1	0.679	1.0	47.7363	66.64	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	55.7722	90.25	0.0	0.0
bg_dip_0_100	229	1.0	18.4801	10.66	0.0	0.0
bg_dip_100_20	990	1.0	22.6198	18.79	0.0	0.0
bg_dip_200_40	1641	1.0	24.9159	23.25	0.0	0.0
bg_dip_400_60	593	1.0	28.2542	28.52	0.0	0.0
bg_dip_600_80	88.4	1.0	32.4948	37.01	0.0	0.0
bg_dip_800_12	22.0	1.0	35.6117	44.07	0.0	0.0
bg_dip_1200_1	1.34	1.0	40.9417	62.28	0.0	0.0
bg_dip_1600_i	0.0921	1.0	39.5454	52.86	0.0	0.0

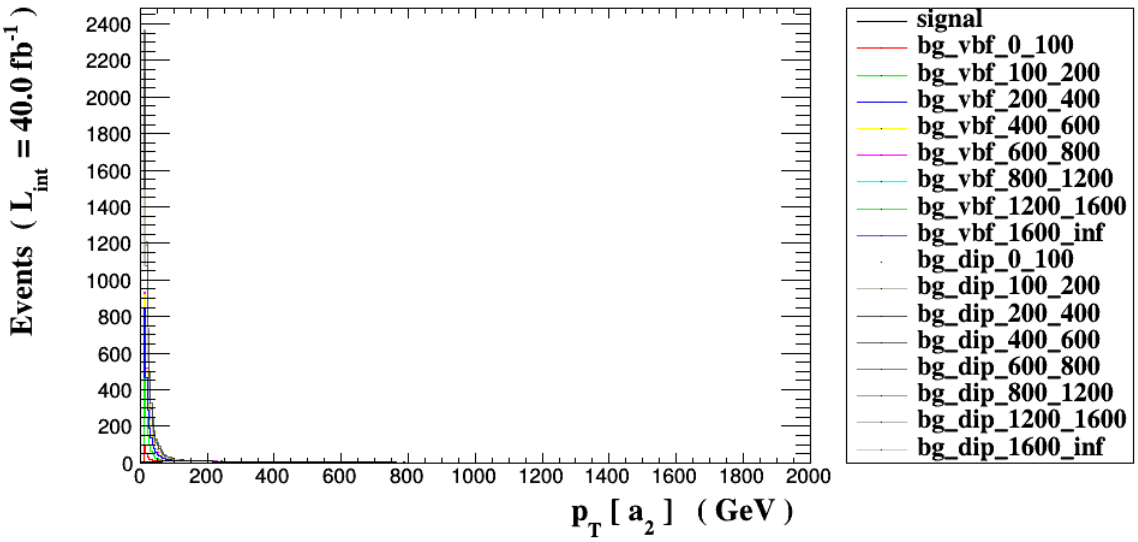

Figure 12.

3.14 Histogram 13

*** Plot: THT**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	507.885	301.4	0.0	0.0
bg_vbf_0_100	204	1.0	80.0473	13.56	0.0	0.0
bg_vbf_100_20	950	1.0	148.504	28.23	0.0	0.0
bg_vbf_200_40	1147	1.0	280.038	55.43	0.0	0.0
bg_vbf_400_60	273	1.0	470.788	53.26	0.0	0.0
bg_vbf_600_80	47.8	1.0	673.708	54.12	0.0	0.0
bg_vbf_800_12	12.1	1.0	913.459	95.89	0.0	0.0
bg_vbf_1200_1	0.679	1.0	1317.18	96.33	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	1746.51	154.0	0.0	0.0
bg_dip_0_100	229	1.0	81.198	11.55	0.0	0.0
bg_dip_100_20	990	1.0	149.332	28.78	0.0	0.0
bg_dip_200_40	1641	1.0	291.317	57.13	0.0	0.0
bg_dip_400_60	593	1.0	468.474	52.76	0.0	0.0
bg_dip_600_80	88.4	1.0	671.958	53.55	0.0	0.0
bg_dip_800_12	22.0	1.0	913.039	95.11	0.0	0.0
bg_dip_1200_1	1.34	1.0	1317.3	95.54	0.0	0.0
bg_dip_1600_i	0.0921	1.0	1752.54	159.1	0.0	0.0

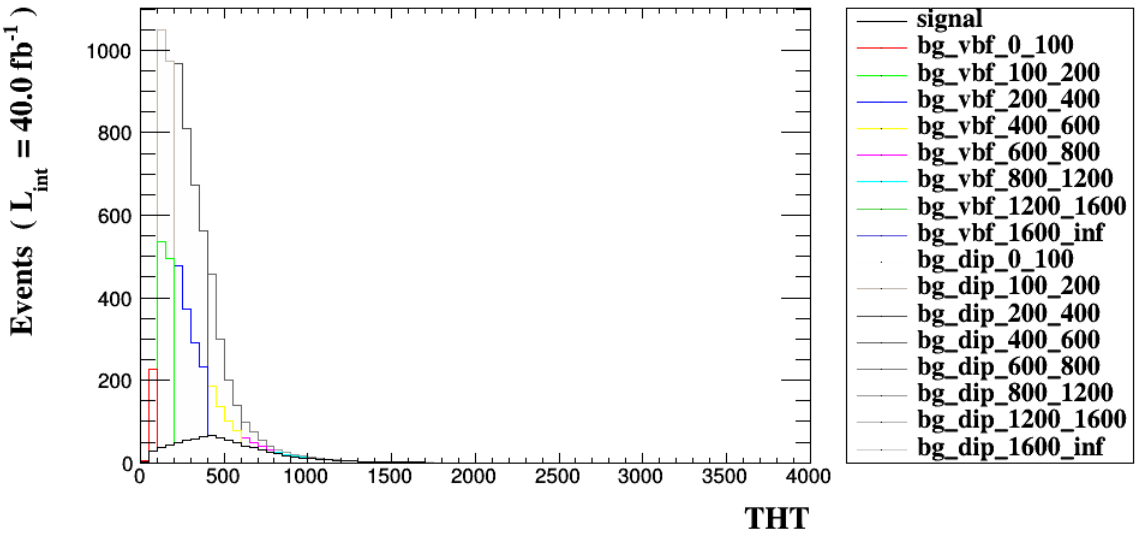

Figure 13.

3.15 Histogram 14

*** Plot: MET**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	8.09646e-09	1.05e-08	0.0	0.0
bg_vbf_0_100	204	1.0	6.13592e-10	4.552e-10	0.0	0.0
bg_vbf_100_20	950	1.0	1.03092e-09	1.186e-09	0.0	0.0
bg_vbf_200_40	1147	1.0	3.36865e-09	2.263e-09	0.0	0.0
bg_vbf_400_60	273	1.0	4.56964e-09	2.632e-09	0.0	0.0
bg_vbf_600_80	47.8	1.0	4.96887e-09	2.751e-09	0.0	0.0
bg_vbf_800_12	12.1	1.0	5.28307e-09	3.254e-09	0.0	0.0
bg_vbf_1200_1	0.679	1.0	7.52198e-09	9.546e-09	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	1.22923e-08	1.66e-08	0.0	0.0
bg_dip_0_100	229	1.0	6.61933e-10	5.01e-10	0.0	0.0
bg_dip_100_20	990	1.0	1.14677e-09	1.31e-09	0.0	0.0
bg_dip_200_40	1641	1.0	3.50426e-09	2.297e-09	0.0	0.0
bg_dip_400_60	593	1.0	4.46792e-09	2.601e-09	0.0	0.0
bg_dip_600_80	88.4	1.0	4.82548e-09	2.658e-09	0.0	0.0
bg_dip_800_12	22.0	1.0	5.1849e-09	3.953e-09	0.0	0.0
bg_dip_1200_1	1.34	1.0	8.14981e-09	1.15e-08	0.0	0.0
bg_dip_1600_i	0.0921	1.0	1.17676e-08	1.68e-08	0.0	0.0

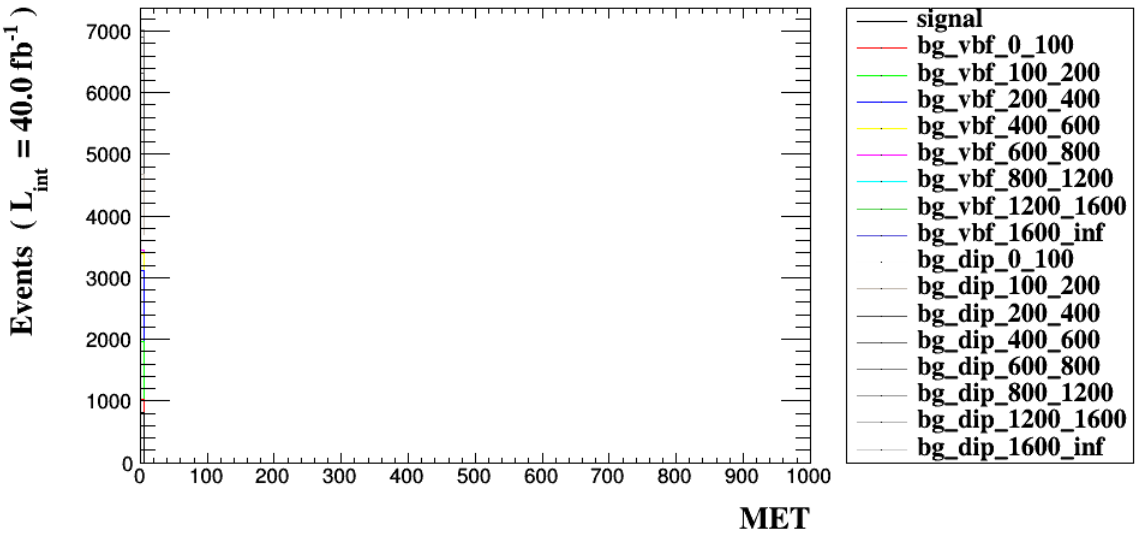

Figure 14.

3.16 Histogram 15

*** Plot: TET**

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
signal	814	1.0	1461.81	771.9	0.0	0.0
bg_vbf_0_100	204	1.0	137.302	35.41	0.0	0.0
bg_vbf_100_20	950	1.0	223.35	59.19	0.0	0.0
bg_vbf_200_40	1147	1.0	387.136	104.6	0.0	0.0
bg_vbf_400_60	273	1.0	624.85	145.3	0.0	0.0
bg_vbf_600_80	47.8	1.0	875.539	196.5	0.0	0.0
bg_vbf_800_12	12.1	1.0	1162.22	278.8	0.0	0.0
bg_vbf_1200_1	0.679	1.0	1643.9	398.6	0.0	0.0
bg_vbf_1600_i	0.0492	1.0	2202.81	641.0	0.0	0.0
bg_dip_0_100	229	1.0	136.872	36.77	0.0	0.0
bg_dip_100_20	990	1.0	230.259	67.3	0.0	0.0
bg_dip_200_40	1641	1.0	392.705	108.1	0.0	0.0
bg_dip_400_60	593	1.0	598.661	142.3	0.0	0.0
bg_dip_600_80	88.4	1.0	851.073	203.2	0.0	0.0
bg_dip_800_12	22.0	1.0	1152.28	315.0	0.0	0.0
bg_dip_1200_1	1.34	1.0	1618.5	451.0	0.0	0.0
bg_dip_1600_i	0.0921	1.0	2171.49	698.3	0.0	0.0

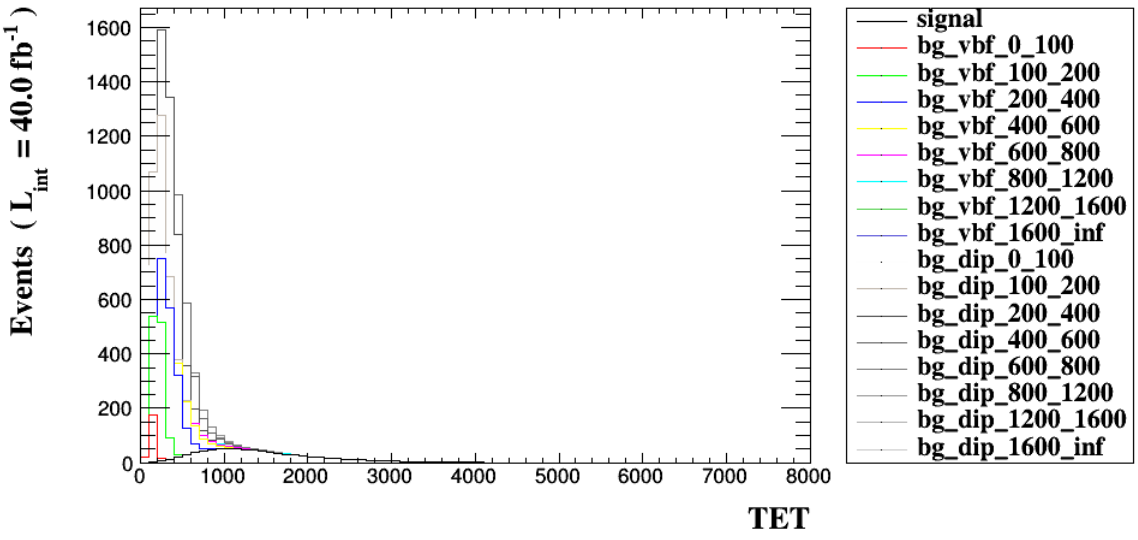

Figure 15.

4 Summary

4.1 Cut-flow charts

- How to compare signal (S) and background (B): S/sqrt(S+B+(xB)**2) .
- Object definition selections are indicated in cyan.
- Reject and select are indicated by 'REJ' and 'SEL' respectively

Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	4094.08 +/- 1.13	4113516 +/- 4877	2.01760 +/- 0.00132
SEL: (sdETA (jets[1] jets[2]) > 3.6 or sdETA (	814.6 +/- 25.5	6203.5 +/- 76.0	9.723 +/- 0.292