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VBF background analysis

Some useful links

- HiggsVBF main twiki
- The Code [↗](#)

Datasets

Dataset name	Initial N_{evt} (10^6)	Final N_{evt} (10^3)	Integrated luminosity (nb^{-1})	Cr
Data				
/JetMET/Run2010A-Sep17ReReco_v2/RECO	2.41	1.293	3100	---
MC - Pythia8				
/QCD_Pt_15to30_Tune1_7TeV_pythia8/Fall10-START38_V12-v1/GEN-SIM-RECO	1.097	---	1.41	78
/QCD_Pt_30to50_Tune1_7TeV_pythia8/Fall10-START38_V12-v1/GEN-SIM-RECO	1.10	---	21.87	50
/QCD_Pt_50to80_Tune1_7TeV_pythia8/Fall10-START38_V12-v1/GEN-SIM-RECO	1.09	---	180.8	60
/QCD_Pt_80to120_Tune1_7TeV_pythia8/Fall10-START38_V12-v1/GEN-SIM-RECO	1.09	---	1459	75
/QCD_Pt_120to170_Tune1_7TeV_pythia8/Fall10-START38_V12-v1/GEN-SIM-RECO	0.88	---	7857	11
MC - Pythia6				
/QCD_Pt_15to30_Tune1_7TeV_pythia6/Fall10-START38_V12-v1/GEN-SIM-RECO	5.45	---	6.68	81
/QCD_Pt_30to50_Tune1_7TeV_pythia6/Fall10-START38_V12-v1/GEN-SIM-RECO	3.26	---	61.37	53
/QCD_Pt_50to80_Tune1_7TeV_pythia6/Fall10-START38_V12-v1/GEN-SIM-RECO	3.19	---	501.8	63
/QCD_Pt_80to120_Tune1_7TeV_pythia6/Fall10-START38_V12-v1/GEN-SIM-RECO	3.21	---	4090.3	78
/QCD_Pt_120to170_Tune1_7TeV_pythia6/Fall10-START38_V12-v1/GEN-SIM-RECO	3.05	---	26455	11

Tag by p_T

Tag jets are, in this case, are the two jets in the event passing all selection cuts that have the largest p_T .

Accepted events

In this case the HLT_Jet30U is selected with an integrated luminosity for the sample is 3.1/pb.

Selection Cut	No. of accepted events
Initial number of events after preselection:	3105866
Pass HLT selection	134464
One and only one primary vertex:	56963
Vertex displacement in $z < 15$ cm:	56954
Vertex ndof ≥ 4 :	56928
At least two jets with $p_T > 25$ GeV:	
Leading p_T jets with $\text{abs}(\Delta) < 4.0$:	

In addition to these selection cuts, it is required that jets in the region $-2.4 < \Delta < 2.4$ pass the following cuts:

- At least 2 constituents
- Charged hadronic fraction > 0

- Charged EM fraction < 1
- Total neutral fraction < 0.9

Otherwise, we only require they pass the p_T requirement.

Basic distributions for 'tagged' jets

Dijet quantities

Inner jet quantities

To avoid confusion with central jets, I call jets inside the eta region bound by the two tagged jets inner jets. The following plots are inclusive.

p_{tHat}

Tag by

For this selection we choose the two tagged jets to be the two jets with the largest value of Δ .

Accepted events

In this case the HLT_Jet30U is selected with an integrated luminosity for the sample is 3.1/pb.

Selection Cut	No. of accepted events
Initial number of events after preselection:	
Pass HLT selection	
One and only one primary vertex:	
Vertex displacement in $z < 15$ cm:	
Vertex ndof ≥ 4 :	
At least one jet with $abs(eta) > 2.0$ & $p_T > 25$ GeV:	
Two tagged jets with $p_T > 25$ GeV and $abs(\Delta) < 4.0$:	

In addition to these selection cuts, it is required that jets in the region $-2.4 < \eta < 2.4$ pass the following cuts:

- At least 2 constituents
- Charged hadronic fraction > 0
- Charged EM fraction < 1
- Total neutral fraction < 0.9

Otherwise, we only require they pass the p_T requirement.

Basic distributions for 'tagged' jets

Dijet quantities

Inner jet quantities

To avoid confusion with central jets, I call jets inside the eta region bound by the two tagged jets inner jets. The following plots are inclusive.

ptHat

Original selection

There is no trigger selection on this sample. The integrated luminosity is 3.1/pb.

Selection Cut	No. of accepted events
Initial number of events:	3105866
One and only one primary vertex:	588685
Vertex displacement in $z < 15$ cm:	579057
Vertex ndof ≥ 4 :	578850
At least one forward jet with $p_T > 30$ GeV:	125700

An additional central jet with $p_T > 30$ GeV	78292
Two back-to-back forward jets with $p_T > 30$ GeV:	12127

Forced forward jet selection. Hide it

One forward jet case

First, I consider the case that you have only one forward jet. The requirements on this jet are:

- $|\eta| > 2.6$
- $p_T > 30$ GeV

Because this jet is in HF, I am not currently applying any jet ID cuts, but will once we determine appropriate values. If one forward jet is found, I then look for the highest p_T central jet. The requirements on this jet are:

- $p_T > 30$ GeV
- $N_{\text{constituents}} > 1$
- Charged hadronic fraction > 0
- Neutral hadronic fraction < 1
- Neutral EM fraction < 1

Basic distributions for 'tagged' jets

Dijet quantities

Inner jet quantities

To avoid confusion with central jets, I call jets inside the eta region bound by the two tagged jets inner jets. The following plots are inclusive.

Two forward jets

The same cuts are applied in this case except there are two jets in the forward region of the detector. The two forward jets are required to be approximately back-to-back in η . Only the two leading p_T forward jets are considered at the moment.

Basic distributions for 'tagged' jets

Dijet quantities

Inner jet quantities

To avoid confusion with central jets, I call jets inside the eta region bound by the two tagged jets inner jets.

-- NateOdell - 23-Nov-2010

This topic: Main > VBFqcdBG

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