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# Jet s subgr oup

## Goal of the group

## Group Contact s

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## Avai labl e Tool s

## Set t i ngs for compar i son st udi es

### H+2-jet NLO+shower compar i son st udy

Process/Inputs:

=====

```
* pure gg -> H + 2j NLO+shower at parton level

* m_H = 125 GeV
* \sqrt{s} = 8 TeV
* strict mtop -> \infty limit (no mtop rescaling or bottom interference)
* on-shell stable Higgs
* MSTW2008 NLO PDFs (68CL) (always also at LO)
  with its alphas(mZ) = 0.12018, nf = 5, 2-loop running
* \mu_r = \mu_f = \mu = m_H in (N)LO hard matrix element corrections
```

Jet cuts:

=====

(\eta is pseudorapidity, y is rapidity)

a) Jet selection:

```
* anti-kT with R = 0.4
* at least two jets with pTj > 25 GeV and |\eta_j| < 5
```

b) VBF cuts:

```
* \delta y_jj = |y_j1 - y_j2| > 2.8
* m_jj > 400 GeV
```

Distributions:

=====

All distributions with

```
* only cuts a) and cuts a)+b)
* at LO and NLO each with \mu = {2 m_H, m_H, m_H/2}
```

```
1) pTj1 [0, 300] in steps of 5 GeV
2) pTj2 [0, 300] in steps of 5 GeV
3) yj1 [-5, 5] in steps of 0.5
```

- 4)  $y_{j2}$  [-5, 5] in steps of 0.5
- 5)  $|\Delta y_{jj}|$  [0,10] in steps of 0.5
- 6)  $m_{jj}$  [0, 1000] in steps of 40 GeV
  
- 7)  $\Delta\phi_{jj}$  [0,  $\pi$ ] in steps of  $\pi/20$
- 8)  $p_{Tj3}$  [0, 300] in steps of 5 GeV
- 9)  $y_{j3}$  [-5, 5] in steps of 0.5
  
- 10)  $|\eta_H - 0.5(\eta_{j1} + \eta_{j2})|$  [0,10] in steps of 0.5
- 11)  $p_{T\{Hjj\}} = |\vec{p}_{\{TH\}} + \vec{p}_{\{Tj1\}} + \vec{p}_{\{Tj2\}}|$  [0, 300] in steps of 5 GeV
- 12)  $\pi - \Delta\phi_{\{H,jj\}}$  [0, 1.5] in steps of 0.05

## Results

First comparisons can be found [here](#).

## Guidelines for UE related uncertainties

The following are guidelines for the estimation of UE related uncertainties in ggF and VBF processes:

- 1) Turn UE on/off for the nominal default tune (expect ~10-20% variations depending on selection cuts and tune)
- 2) Cross check on/off effect for alternative tunes (that are also deemed "reasonable")
- 3) Cross checks can include the use of tunes performed within a common framework but using different PDFs (eg. NLO v. LO, as is the case with AU2-CT10 and AU2-CTEQ6L1)

First studies can be found [here](#) and these studies will continue past the Moriond conferences. Until these guidelines can be implemented, the following temporary uncertainties are suggested:

- 1) For ggF+2j use 30% uncertainty
- 2) For VBF use 7% uncertainty

These uncertainties pertain to the normalization of both samples in the loose and tight VBF categories.

## References

## Meetings

- 18/05/12 [↗](#)
- 12/10/12 [↗](#)
- 29/11/12 [↗](#)
- 20/12/12 [↗](#)
- 08/02/13 [↗](#)
- 25/01/13 [↗](#)

## Links

-- ReiTanaka - 02-May-2012

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This topic: LHCPhysics > LHCXSWG HiggsJets

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