vvh 1TeV study for DBD

ILD Analysis meeting

Nov. 14 2012
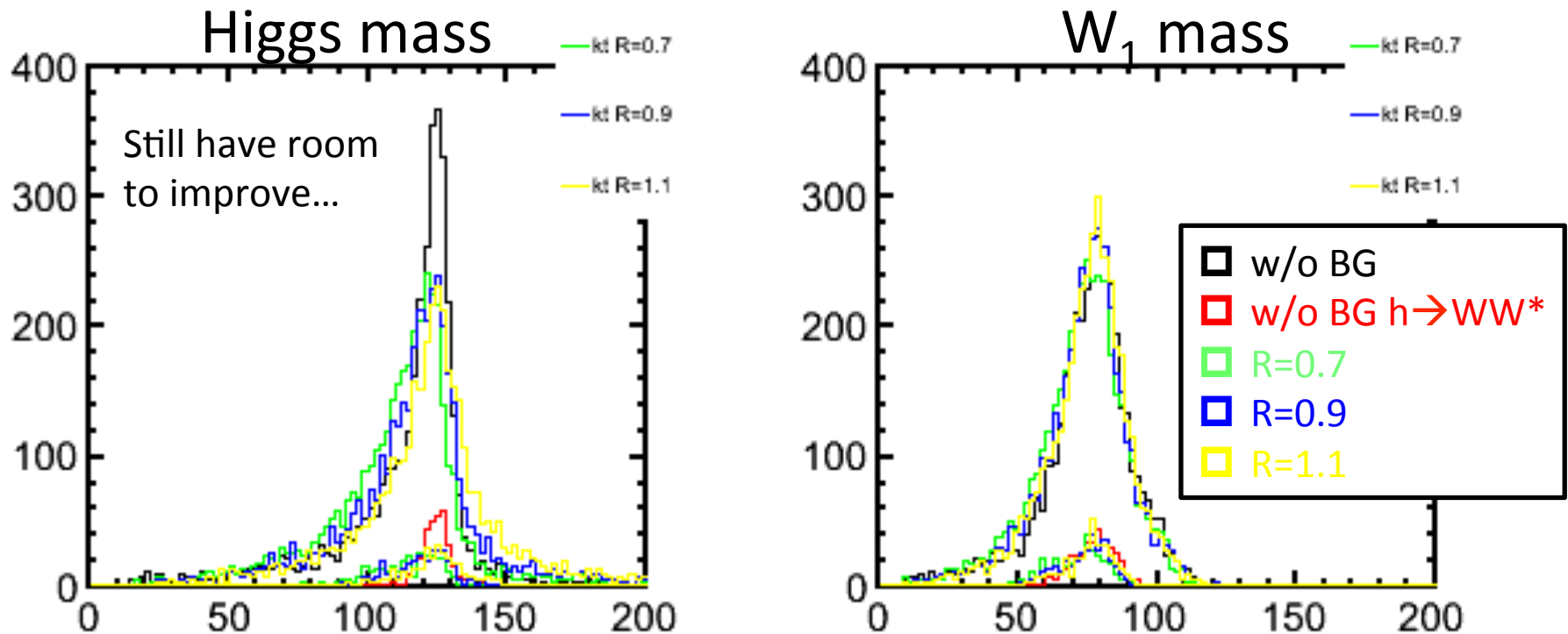
H.Ono (NDU)

Status and to do list

- h→bb, cc, gg channel
  (Preliminary results are obtained with template fitting)
  - Increase BG statistics (sznu_sl are available)
  - Check 3f BGs (simulated samples are available)

- h→WW*→4j channel
  (Preliminary result will come soon)
  - Optimize kt R parameter for 4 jet reconstruction (now)
  - Improve BG reduction and h→others suppression

- γγ→hadron BG suppression
  - Check more detail with PFO based study (kt clustering)

Reconstructed four jet with kt algorithm on several R parameters
(Only small statistics, need to increase to check WW→4j channel)

Higgs mass

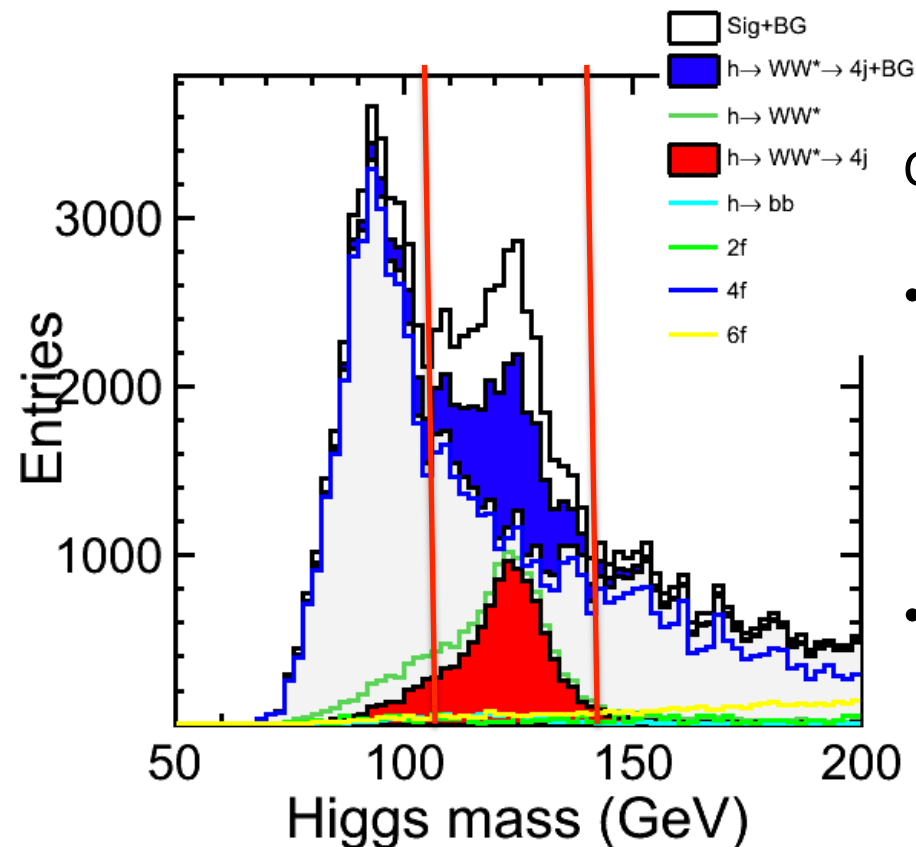W₁ mass

Still have room
to improve…

R parameter optimization
R=0.9 might be optimal for h→WW*→4j channel

What to do in H→WW*

Cut based preliminary result will obtain soon.

- Need to reduce BG fluctuation with increasing the 4f BG statistics →Already simulated/reconstructed, need to reprocess them.

- Need to improve for further reduction especially in h→others channel

DBD benchmarking vvh section

Because of the different reconstruction of each channel in vvh, we revise to show each channel separately.

1. Introduction
2. h$\rightarrow$bb, cc, gg channel
   1. 2 jet clustering with kt algorithm (R=1.1)
   2. BG reduction
   3. Template fitting with LCFIPlus (Preliminary result)
3. h$\rightarrow$WW* channel
   1. 4 jet clustering with kt algorithm (R=0.9)
   2. Jet pairing (χ^2) and BG reduction
      (Preliminary but need to improve BG reduction, h$\rightarrow$others)
4. h$\rightarrow\mu\mu$ channel (Constantino prepare this part)
5. Summary table of σBR accuracies
   1. L=500 fb^{-1} or 1 ab^{-1} only with P(-0.8, +0.2)

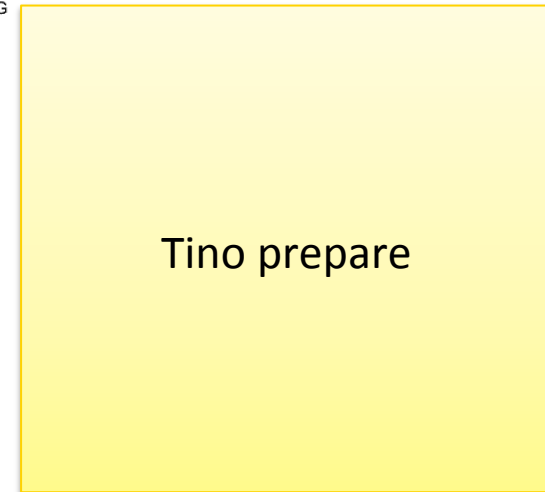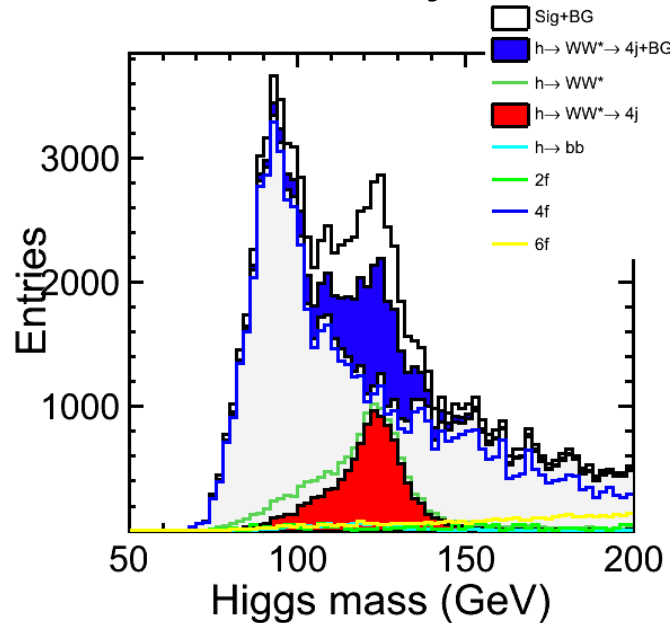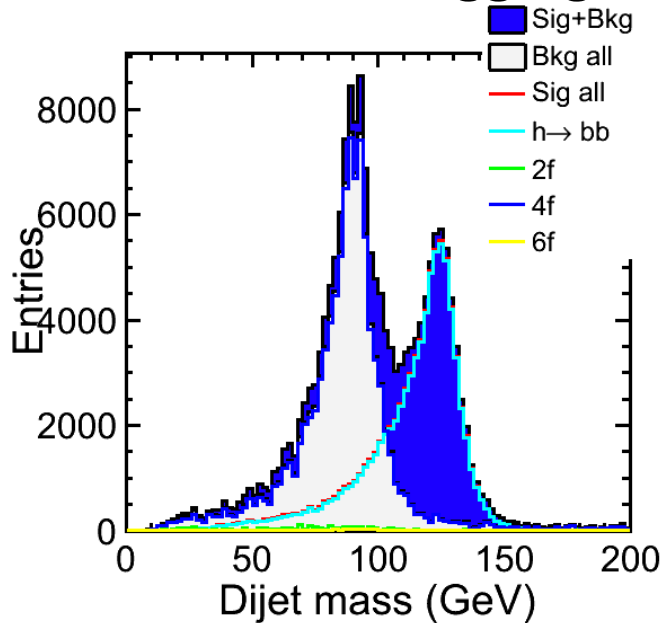Mass distribution of each channel (h→bb, WW*, μμ)

h→bb after b-tagging cut   h→WW*→4j channel   h→μμ

2f, 4f, 6f BGs for jet channel
L=500 fb⁻¹ with P(-0.8, +0.2)