Higgs Branching ratio study

ILC physics and software meeting

Feb. 18. 2011

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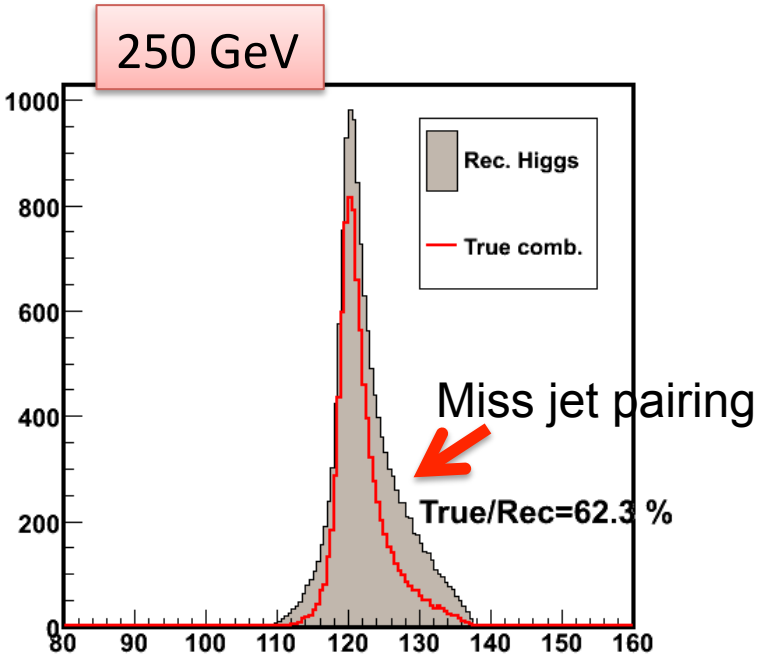
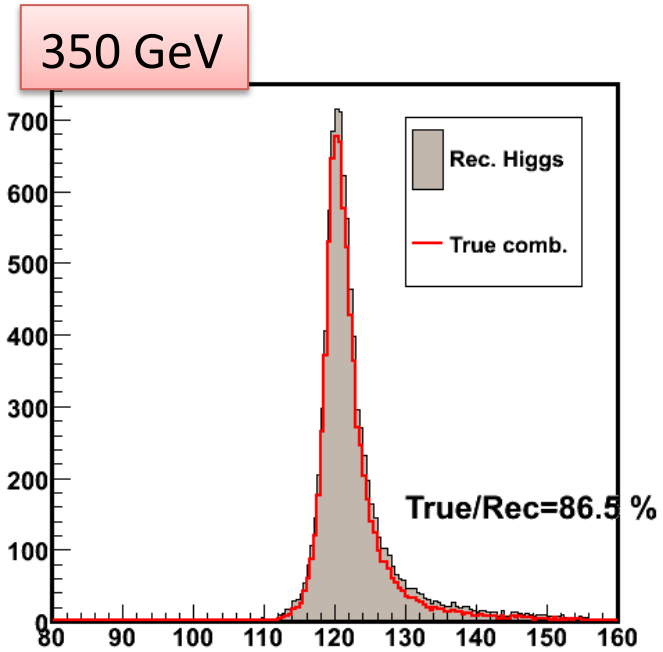
Current status

- Copy new DST sample files for template fitting
  - Grid copy takes time, still running
    - Caused by small size, huge amount of files (~30000 files/10MB)
  - 350GeV DST samples are placed on following common dir,
    - /data15/soft/samples/grid/ilc/CDS/reconstructed/ILD_00/
- BR study assignment
  - Ono: Concentrate vvH/qqH jets mode analysis
  - Nina (Bonne Univ, Master student): analyze llH mode
    - Checking the efficiency and purity of lepton ID
- Kinfit and cut optimizations are considered
  - Still in progress

Higgs jet paring peformance

qqH 4 jet fitted Higgs mass distribution after all cuts



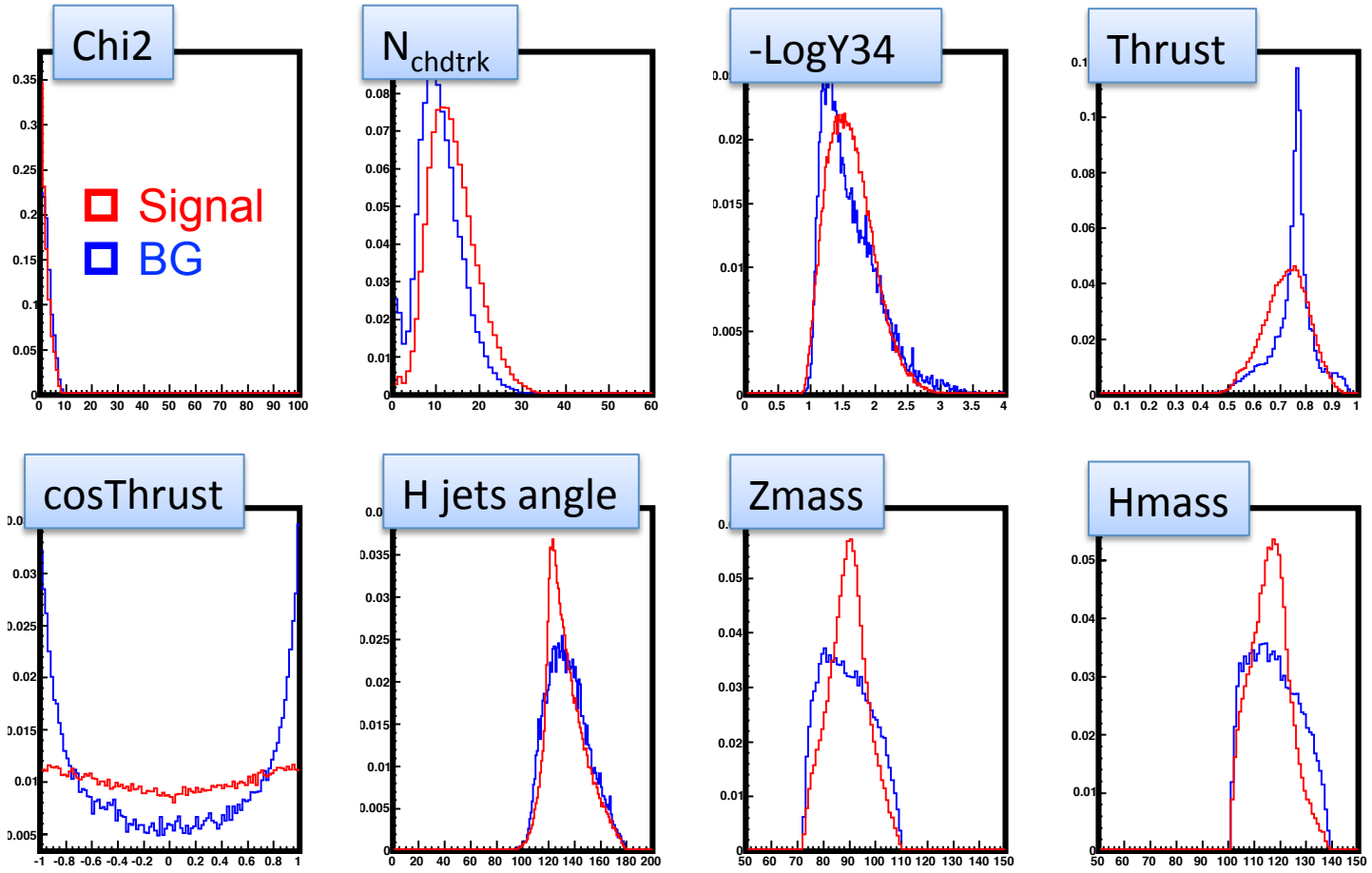


Wider distribution from miss jet paring at 250 GeV

vvH 350 GeV case, W-fusion process contribution
becomes large and kinematic fitting does not work efficiently
(Missing mass constraint)

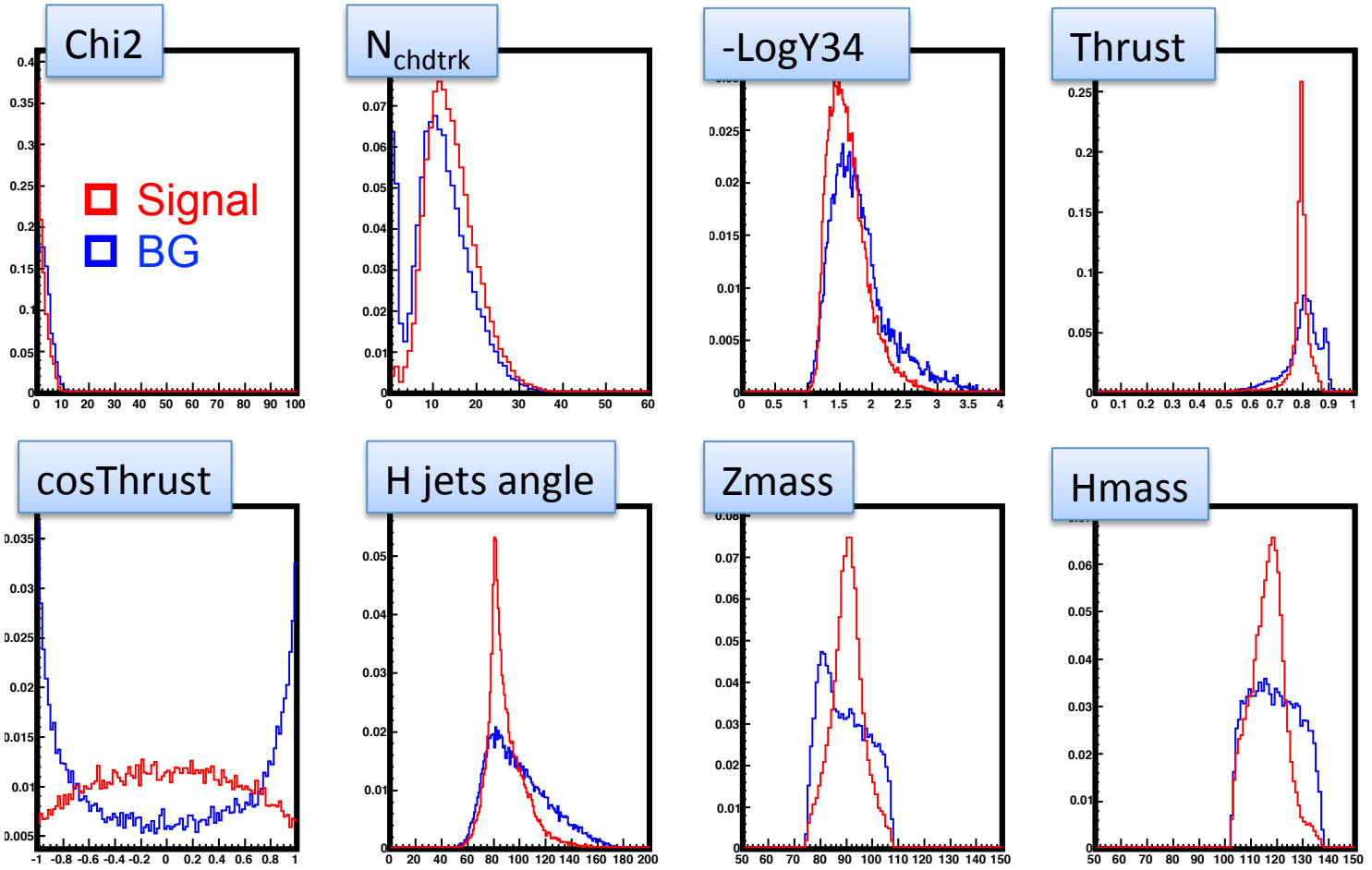
qqH 250 GeV cut parameters

Apply every cut without itself, height is normalized to be 1



qqH 350 GeV cut parameters

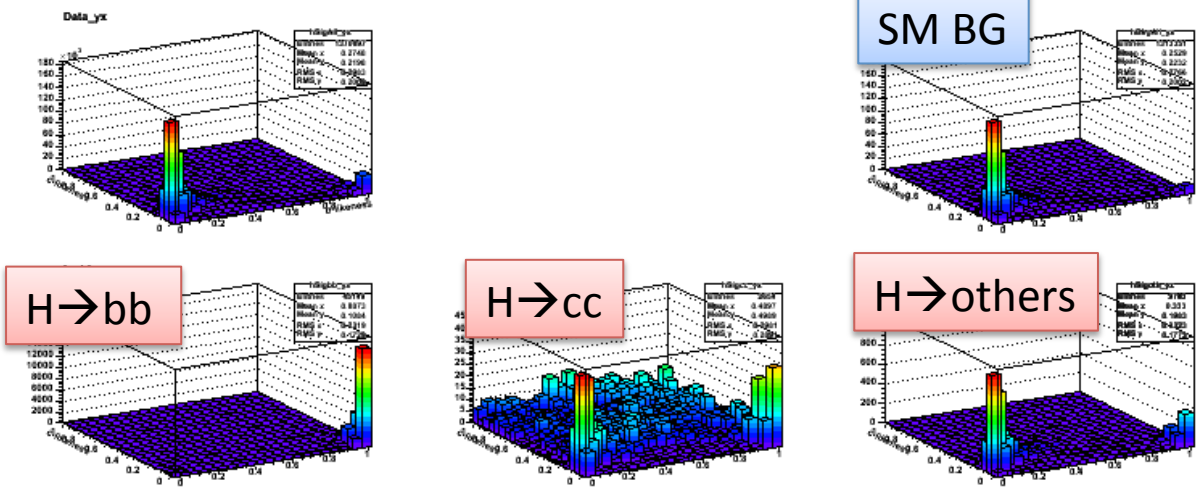
Apply every cut without itself, height is normalized to be 1



Better signal and background separation in 350 GeV, thrust, cosThrust, Z/H mass

Accuracy of Higgs BR measurement

1000fb^{-1} template samples are prepared
Previously 1000fb^{-1} signal samples are scaled to be 250fb^{-1}
(Even the BG samples are still smaller statistics)



Ignore small statistics template bins
for template fitting

Template sample
cut value optimization
qqH 250 GeV