ttH: Towards the DBD

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October 24, 2012

ttH: Towards
the DBD

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Motivation

$\gamma\gamma$ Removal

Central
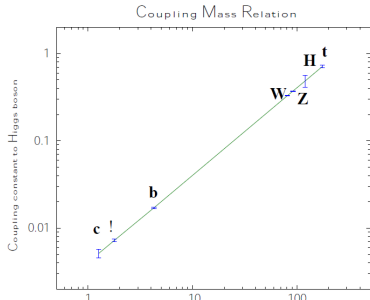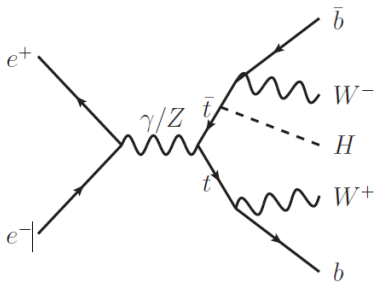Samples

Cut Reoptimi-
sation

To Do

Overview

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To Do

Motivation

- Need to understand the origin of EWSB and mass generation
- The ILC will allow precise measurements of the 126 GeV Higgs couplings to the gauge bosons and fermions
- Coupling to fermions

$$g_{ffH} = \frac{m_f}{\nu}$$

- Top quark heaviest fermion so coupling will be greatest

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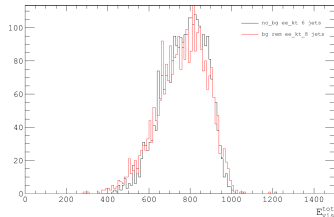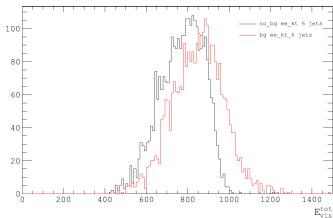sation

To Do

This Morning
Did I lie?

Conclusions

500 GeV

- $\left(\frac{\Delta g_{ttH}}{g_{ttH}}\right)_{stat}$ = 21.6 % for semi leptonic mode and unpolarised beams
- $\left(\frac{\Delta g_{ttH}}{g_{ttH}}\right)_{stat}$ = 10.0 % combined for e^{+} +0.3, e^{-} -0.8 with likelihood
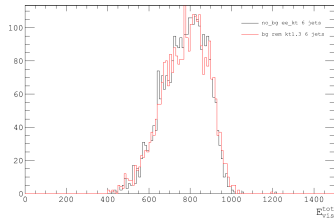
1 TeV

- Tools there which allow good reconstruction of semi leptonic mode
- $\left(\frac{\Delta g_{ttH}}{g_{ttH}}\right)_{stat}$ = 5.2 % for semi leptonic mode and fully polarised beams
- Simulations for DBD complete
- Reconstruction for DBD almost complete
- DBD benchmark to be completed within a few weeks

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To Do

$\gamma\gamma$ Removal

- We know that we need to remove $\gamma\gamma$

- 8 Jets ee_kt remove beam jets

- 6 Jets kt and vary R

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To Do

$\gamma\gamma$ Removal

Method	χ^2	Eff	Purity	sqrt(eff*pur)
ee_kt 8j	61.899	0.904	0.922	0.913
kt0.5	252.437	0.729	0.958	0.835
kt0.6	192.129	0.776	0.951	0.859
kt0.7	126.776	0.816	0.944	0.878
kt0.8	88.3815	0.847	0.937	0.891
kt0.9	67.4123	0.873	0.931	0.901
kt1.0	45.6656	0.894	0.925	0.910
kt1.1	38.7979	0.912	0.920	0.916
kt1.2	28.3917	0.927	0.915	0.921
kt1.3	32.9834	0.939	0.911	0.925
kt1.4	37.9565	0.949	0.907	0.928
kt1.5	47.2999	0.957	0.903	0.929

Chosen kt 6 Jet R=1.3 to match with CLIC studies

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To Do

Central Samples

- Have ttH-ln4q-hbb in all polarisations
- Have all 6f_ttbar in all polarisations
- Have the code to analyse and know weights (Thank you Tomohiko and Jenny)
- Currently no ttz or ttbb ??
- /grid/ilc/prod/ilc/mc-dbd/ild/dst/1000-B1b_ws
- Do I need to add ttH→others as SiD have done?

All of tth-ln4q-hbb and 6f_ttbar as of 30 minutes ago have had lepton removed, background removed and ReVertexed
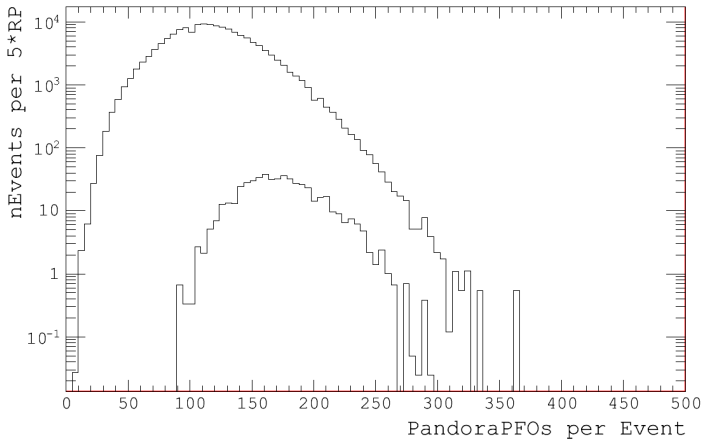
nPFOs

$$nPFOs > 153$$

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To Do

Thrust

Thrust < 0.88

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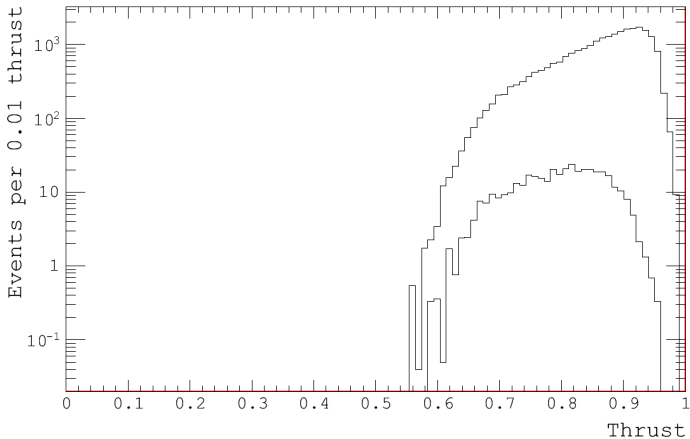
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To Do

To Do

- finalise cuts - CPU intensive die to flavour tag, jet clustering + huge number of events
- only want to do this once if possible. Will wait for 1TeV LCFIPlus samples unless 500 mGeV will suffice?
- Reconstruct the masses (code already done)
- Add in ttH→non tth-ln4q-hbb??
- Add in ttz and ttbb but seem to be missing?
- TMVA?

Conclusion
No I was not lying, but maybe I was! (Depends on peoples opinions)