Measurement of the top Yukawa coupling at $\sqrt{s}$ = 1 TeV: comparison of ILD and SiD

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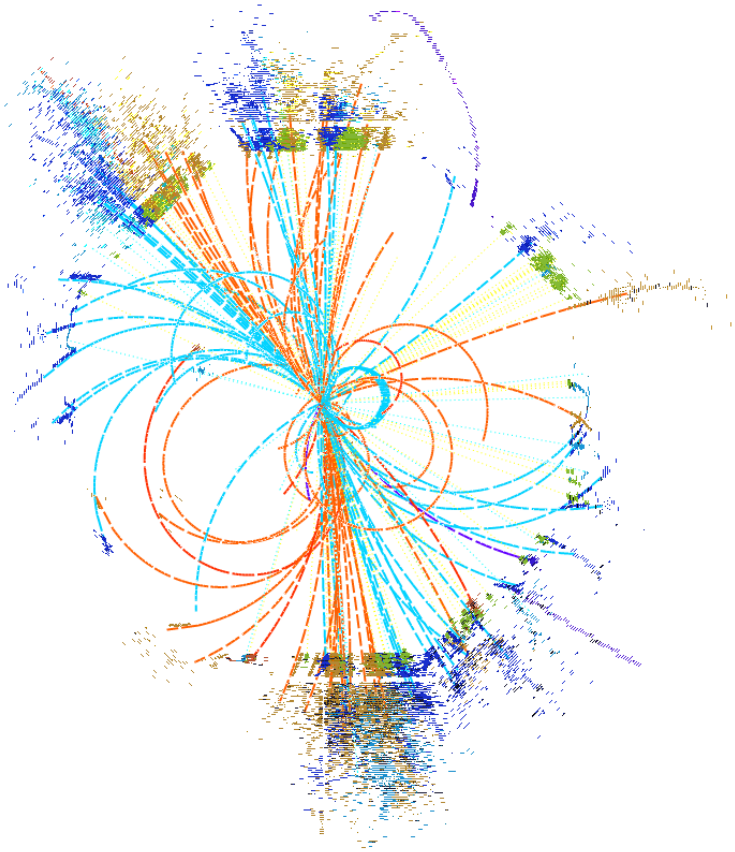


Joint ILD / SiD analysis meeting, 25/01/2013

Changes to the analyses

- Normalisation error identified and corrected

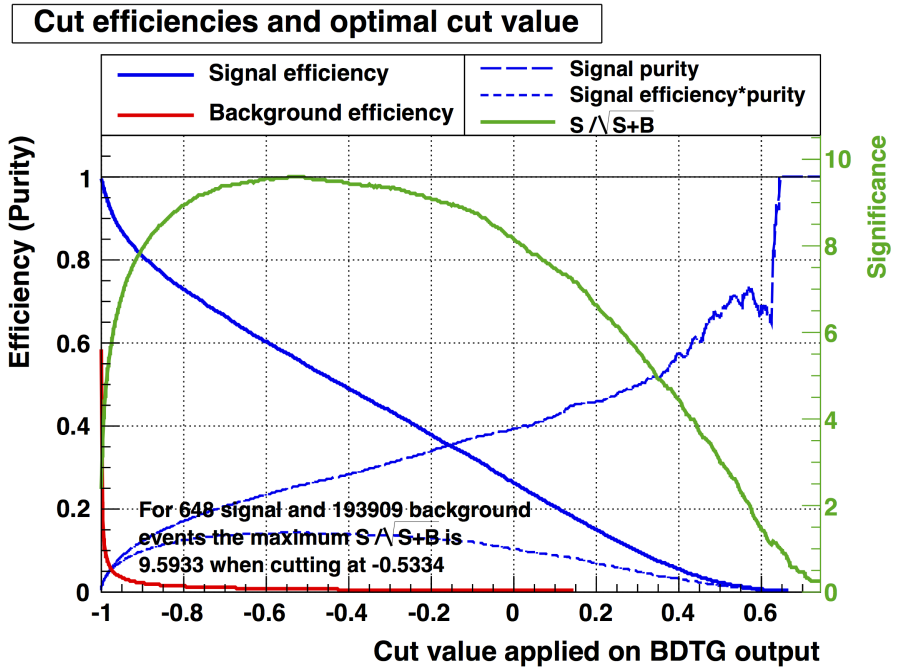
→ Precision of the ILD analysis improved

- Difference in the event selection method identified:

ILD: Gradient boost for BDT training
SiD: Adaptive boost for BDT training, now changed to gradient boost

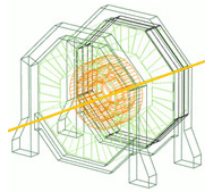
→ Precision of the SiD analysis improved

Overall precision again very similar (see next slide)



(ILD, 8 jets)

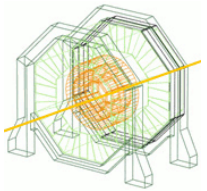
Updated numbers on $\sigma(y_t)/y_t$



Final state:	ILD:	SiD:	SiD using ILD strategy:
Semileptonic ("6 jets")	6.9%	6.9%	7.0%
Fully hadronic ("8 jets")	5.4%	6.0%	5.8%
Combined	4.3%	4.5%	4.5%

ILD strategy: Preselect events with one isolated lepton for 6 jets final state and events without isolated lepton for 8 jets final state
SiD strategy: Number of isolated leptons is variable in BDT event selection

Other checks



1.) Isolated lepton ID:
Both using IsolatedLeptonFinder in Marlin,
ILD uses jet based isolation, SiD uses cone based isolation
→ Difference between both methods is small

2.) Strategy of jet reconstruction:
ILD and SiD both use Durham, ILD removes background using
k_t jet finder, SiD removes forward PFOs
→ Different optimisation due to extra pair background in the SiD study

3.) Training of flavour tagging:
Both analysis used 6-jet events at 1 TeV samples for training

4.) Input variables to TMVA:
Using similar sets of variables for both analyses, difference for leptonic decaying W (ILD reconstructs its mass, SiD uses missing transverse momentum and total event energy and number of isolated leptons)
→ Similar discriminating power of both selections