
Top electroweak couplings study using di-muonic state at $\sqrt{s} = 500 \text{ GeV}$, ILC

Yo Sato

Cut study of di-leptonic analysis (at Top@LC 16)

500 fb ⁻¹ (-0.8,+0.3)	ttbar di-leptonic (Signal)	ttbar Semi-leptonic	ZZ semi-leptonic	Single Z ee
Generated	53289 (100%)	208505 (100%)	183053 (100%)	941270 (100%)
# of lepton = 2	25482 (47.8%)	2716 (1.30%)	28343 (15.5%)	97536 (10.362%)
b-tag1 > 0.8 or b-tag2 > 0.8	22278 (41.8%)	2029 (0.973%)	5110 (2.79%)	13942 (1.48%)
Thrust < 0.9	21612 (40.6%)	2022 (0.970%)	1524 (0.833%)	5727 (0.608%)
Evis < 420	20958 (39.3%)	1252 (0.600%)	502 (0.274)	1114 (0.118%)

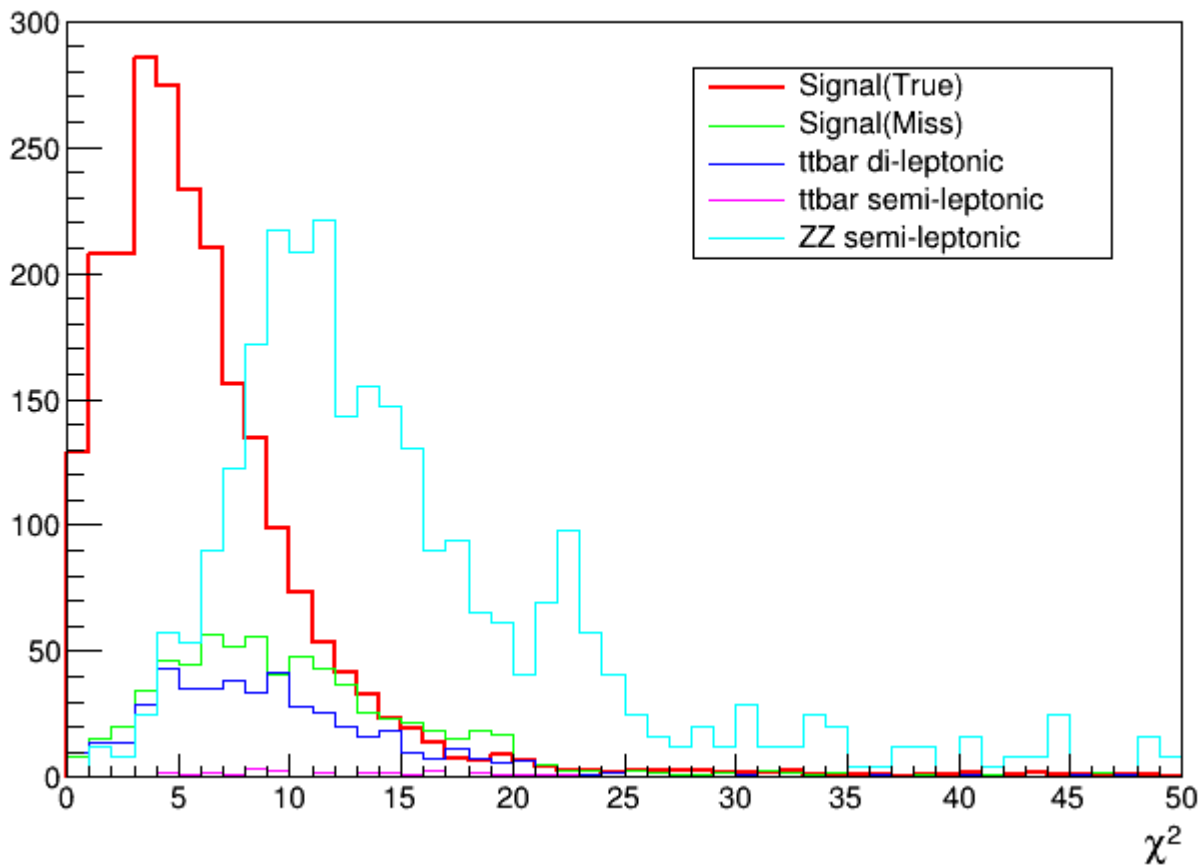
Efficiency = 39.3%, Significance ($N_{sig.}/\sqrt{N_{sig.} + N_{bkg.}}$) = 135.8

Cut table for di-muonic state (preliminary)

250 fb ⁻¹ (-0.8,+0.3)	Signal (ttbar di-muonic)	ttbar di-leptonic (bkg.)	ttbar semi-leptonic	ZZ semi-leptonic
Generated	2866	23766	104252	91527
# of lepton = 2	2601	10081	1358	14162
$\mu^+ \mu^-$	2597	469	30	13733
b-tag1 > 0.8 or b-tag2 > 0.8	2365	336	20	2471
Thrust < 0.9	2288	323	19	735
Evis < 420	2218	322	16	237
M_II - 91 > 5	2070	305	16	83

Cut on χ^2_{tot}

We apply the quality cut ($\chi^2_{\text{tot}}, \Delta\chi^2_{\text{tot}}$) to reduce the miss fraction of b-jets assignment. This is useful to reduce other backgrounds, too.



Cut table for di-muonic state (preliminary)

250 fb⁻¹ (-0.8,+0.3)	Signal (di-muonic) True assignment	Signal (di-muonic) Miss assignment	ttbar di-leptonic (bkg.)	ttbar semi-leptonic	ZZ semi- leptonic
# of lepton = 2 & $\mu^+\mu^-$	1976	621	469	30	13733
b-tag1 > 0.8 or b-tag2 > 0.8	1807	559	336	20	2471
Quality cut ($\chi^2 < 5$ & $\Delta\chi^2 > 6$)	693	41	49	1	19

Investigate the precision and bias with MEM using these events.

Plan

- Check other sources
- Investigate the precision and bias considering bkg.

Request :

Could you produce bkg. events corresponding $> 250\text{fb}^{-1}$ for each polarization ?

(For now I change weights)