

# Electroweak couplings from $t\bar{t}$ 6f and $b\bar{b}$

## Short description.

This benchmark is a challenge of reconstructing multi-jet final state with flavour tag and vertex charge. Main focus is currently on 6-jet ( $bbqqqq$ ) and 4-jet ( $bbqqlv$ ) final states.

$b\bar{b}$  final state is also being investigated with the same framework.

## Main observables.

x-section measured with both beam polarizations, Polar angle ( $A_{FB}$ ) measured with both beam polarizations

## Control variables.

b-tag, c-tag, vertex charge,  $dE_{dx}$ ,  $M_{top}$ ,  $M_W$ ,

## Physics quantities.

form factors, electroweak couplings, distinction between left- and right-handed couplings,

## People.

Sohail Amjad, Adrian Irlles, Yuichi Okugawa, Roman Pöschl, Ryo Yonamine

## Reviewers.

Marcel Vos

## References.

- Sviatoslav's software (vertex charge)
  - Not yet public, still need to clean up, but it works without modification. Contact to [Roman Pöschl](#) for the moment.
- Sviatoslav's paper
  - summary version : <https://arxiv.org/abs/1709.04289>
  - full version will be shortly available online.
- Git
  - [https://github.com/ILDAnaSoft/ILDbench\\_QQbar](https://github.com/ILDAnaSoft/ILDbench_QQbar)
- $t\bar{t}$  paper pre-print
  - <https://arxiv.org/abs/1505.06020>

## Versions of the Note



**idr-hf-v1-8.pdf**



**comments-mv-v1.7.txt**



**idr-hf-v1-9.pdf**



**idr-hf-v2-0.pdf**



**comments-kk-rs-290520.txt**



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**comments-mv-v1-0.txt**



**idr-hf-v1-2.pdf**



**comments-jl150919.txt**



**idr-hf-v1-3.pdf**



**idr-hf-v1-4.pdf**



idr-hf-v1-5.pdf



idr-hf-v1-6.pdf



answers\_jl-v1.6-201219.txt



idr-hf-v1-7.pdf

### **Efficiencies and acceptances**



purity\_v3-eps-converted-to.pdf



purity\_v3.C



acceptance\_2mo...nverted-to.pdf



acceptance\_2models\_v2.C



kaonIDeff\_v2-ep...onverted-to.pdf



kaonIDeff\_v2.C



p\_value\_I5\_ele\_mu\_noLcut.pdf



p\_value\_I5\_ele\_mu\_noLcut.C

## Results



result2models\_v3.pdf



result2models\_v3.C



compare\_normalized.pdf



compare\_normalized.C



compare\_normalized\_b.pdf



compare\_normalized\_b.C



compare\_normalized\_eRpL.pdf



compare\_normalized\_eRpL.C



compare\_norma...ed\_eRpL\_b.pdf



compare\_normalized\_eRpL\_b.C

Interpretation of results (ttbar)



coupl1clhc.pdf



coupl2.C



couplall.pdf



couplall2.C

### Supplementary information



result-Lmodel\_c...ionsteps\_v1.pdf



result-2models\_...orrected\_v1.pdf

Different steps of corrections  
in eebb

Comparison of IDR-L and IDR-S  
in eebb before any correction





result-Lmodel\_c...ctionsteps\_v1.C



result-2models\_...ncorrected\_v1.C