

Tools Tutorial

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- Use the EWDim6 Model
 - Generate 50k events for $p p > w^+ w^- \text{ QED} \leq 2$
 - First for the SM hypothesis
 - use the reweighting method for O_{www} operator with coupling 0.01, 0.1, 1, 10, 100
 - Make the same computation in MadGraph
 - Compare.
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- Redo the computation of all the cross-section with the reweighting method but starting from the $c_{www}=100$ sample.
 - Compare

- Compute the interference between QED/QCD diagram for $t\bar{t}$ production
- In EWDIM6 model, computes the SM+ interference term for $p p \rightarrow w^+ w^-$

- Compute the interference term for photon/Z propagator for $e^+ e^-$ production
 - ➔ You need to create a specific model for this
 - ➔ Modify the $e^+ e^- Z$ coupling to define it as NP coupling

- generate $t\bar{t}$ sample (fully leptonic decay)
 - ➔ make detector simulation with delphes for CMS detector
 - ➔ (use Cards/delphes_card_CMS.dat)
- Use the lhco events file and extract the top mass
 - ➔ create a madweight output
 - ➔ <https://cp3.irmp.ucl.ac.be/projects/madgraph/wiki/TOPMassMeasurmentExample>
- Compute the normalization factor.
 - ➔ compute the effective cross-section for each point of the scan (effective = cross-section*efficiency of cuts)
- Compute the Likelihood and the measured top-mass