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# Wgg in Dim8

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Operators containing  $D_\mu \Phi$  and field strength

The operators in this class are:

$$\mathcal{L}_{M,0} = \text{Tr} [\hat{W}_{\mu\nu} \hat{W}^{\mu\nu}] \times [(D_\beta \Phi)^\dagger D^\beta \Phi] \quad (8)$$

$$\mathcal{L}_{M,1} = \text{Tr} [\hat{W}_{\mu\nu} \hat{W}^{\nu\beta}] \times [(D_\beta \Phi)^\dagger D^\mu \Phi] \quad (9)$$

$$\mathcal{L}_{M,2} = [B_{\mu\nu} B^{\mu\nu}] \times [(D_\beta \Phi)^\dagger D^\beta \Phi] \quad (10)$$

$$\mathcal{L}_{M,3} = [B_{\mu\nu} B^{\nu\beta}] \times [(D_\beta \Phi)^\dagger D^\mu \Phi] \quad (11)$$

$$\mathcal{L}_{M,4} = [(D_\mu \Phi)^\dagger \hat{W}_{\beta\nu} D^\mu \Phi] \times B^{\beta\nu} \quad (12)$$

$$\mathcal{L}_{M,5} = [(D_\mu \Phi)^\dagger \hat{W}_{\beta\nu} D^\nu \Phi] \times B^{\beta\mu} \quad (13)$$

$$\mathcal{L}_{M,6} = [(D_\mu \Phi)^\dagger \hat{W}_{\beta\nu} \hat{W}^{\beta\nu} D^\mu \Phi] \quad (14)$$

$$\mathcal{L}_{M,7} = [(D_\mu \Phi)^\dagger \hat{W}_{\beta\nu} \hat{W}^{\beta\mu} D^\nu \Phi] \quad (15)$$

Vertex with impact: WWW, WWZZ, WWAZ, WWAA, AAZZ, AZZZ, and ZZZZ

Study LM2, LM3 -> direct translation to LEP a0,ac Dim6 Operators



## Packages:

MG version : 5.1.5.9

Pythia version : 6.426

Delphes : 3.0.8

## Model files:

<http://feynrules.irmp.ucl.ac.be/attachment/wiki/>

[AnomalousGaugeCoupling/SM\\_LM0123\\_UFO.tgz](#)

## Dataset:

[/afs/cern.ch/user/l/lgray/public/WAA\\_QGC/](#)



photon/lepton ( $p_T > 10\text{GeV}$ ,  $|\eta| < 2.5$ )

FM2	13TeV (pb)	33TeV (pb)
-5.00E-10	1.174	4.123
-5.00E-11	1.147	3.081
0	1.143	3.084
5.00E-11	1.145	3.085
5.00E-10	1.171	4.187



- Review event selection
- Study Kinematic - photon  $p_T$ , diphoton Mass
- Background estimate - apply jet  $\rightarrow$  photon fake rate from current ATLAS/CMS analysis with large systematic uncertainty
- Limit calculation using Kalanand's package
- Extend analysis to  $WWA/WZA$
- Check the impact to the VBF Higgs production