Basis `SMEFTsim-top` (EFT `SMEFT`)

Basis used in the `SMEFTsim_top` UFO models, version 3.0.0 or later. Implements Warsaw basis with $U(2)^3$ flavor symmetry in the quarks sector and $U(1)^3$ in the leptons sector. Q, t, b are left- and right-handed 3rd gen quarks, q, u, d are the left- and right-handed quark fields containing only the first two generations, and transforming as $U(2)$-flavor doublets. ℓ, e are left- and right-handed lepton fields. Y_u, Y_d are the 2x2 Yukawas of up and down quarks in the first two generations, defined by $L_{SM} \supset \bar{d} Y_d H^\dagger q$ and analogously for the others. Spurions connecting the first two generations with the 3rd are absent. In the UFO models, both Y_u and Y_d are assumed diagonal at the scale of evaluation, and the CKM is taken to be the unit matrix. Flavor indices are indicated with p, r, s, t with Einstein conventions on repeated indices. They run over 1,2 for quarks. This basis definition corresponds to a fixed `LambdaSMEFT=10e+3` in the UFO models. Notation and conventions can vary compared to the Warsaw basis paper, see arXiv:2012.11343 for all definitions.

Sectors

The effective Lagrangian is defined as

$$\mathcal{L}_{\text{eff}} = -\mathcal{H}_{\text{eff}} = \sum_{O_i = O_i^\dagger} C_i\, O_i + \sum_{O_i \neq O_i^\dagger} \left(C_i\, O_i + C_i^*\, O_i^\dagger \right).$$

`dB=dL=0`

WC name	Operator	Type
`cG`	$f^{ABC} G^{A\nu}_{\mu} G^{B\rho}_{\nu} G^{C\mu}_{\rho} / TeV^2$	R
`cGtil`	$f^{ABC} \widetilde{G}^{A\nu}_{\mu} G^{B\rho}_{\nu} G^{C\mu}_{\rho} / TeV^2$	R
`cW`	$\varepsilon^{IJK} W^{I\nu}_{\mu} W^{J\rho}_{\nu} W^{K\mu}_{\rho} / TeV^2$	R
`cWtil`	$\varepsilon^{IJK} \widetilde{W}^{I\nu}_{\mu} W^{J\rho}_{\nu} W^{K\mu}_{\rho} / TeV^2$	R
`cH`	$(H^\dagger H)^3 / TeV^2$	R
`cHbox`	$(H^\dagger H) \Box (H^\dagger H) / TeV^2$	R
`cHDD`	$(D_\mu H^\dagger H)(H^\dagger D^\mu H) / TeV^2$	R
`cHG`	$G^A_{\mu\nu} G^{A\mu\nu} H^\dagger H / TeV^2$	R
`cHGtil`	$\widetilde{G}^A_{\mu\nu} G^{A\mu\nu} H^\dagger H / TeV^2$	R
`cHW`	$W^I_{\mu\nu} W^{I\mu\nu} H^\dagger H / TeV^2$	R
`cHWtil`	$\widetilde{W}^I_{\mu\nu} W^{I\mu\nu} H^\dagger H / TeV^2$	R
`cHB`	$B_{\mu\nu} B^{\mu\nu} H^\dagger H / TeV^2$	R
`cHBtil`	$\widetilde{B}_{\mu\nu} B^{\mu\nu} H^\dagger H / TeV^2$	R
`cHWB`	$B_{\mu\nu} W^{I\mu\nu} H^\dagger \sigma^I H / TeV^2$	R
`cHWBtil`	$B_{\mu\nu} \widetilde{W}^{I\mu\nu} H^\dagger \sigma^I H / TeV^2$	R
`ceHRe11`	$(\bar{\ell}_1 H e_1)(H^\dagger H) / TeV^2 + hc$	R
`ceHRe22`	$(\bar{\ell}_2 H e_2)(H^\dagger H) / TeV^2 + hc$	R

WC name	Operator	Type
ceHRe33	$(\bar{\ell}_3 H e_3)(H^\dagger H)/TeV^2 + hc$	R
ceHIm11	$i(\bar{\ell}_1 H e_1)(H^\dagger H)/TeV^2 + hc$	R
ceHIm22	$i(\bar{\ell}_2 H e_2)(H^\dagger H)/TeV^2 + hc$	R
ceHIm33	$i(\bar{\ell}_3 H e_3)(H^\dagger H)/TeV^2 + hc$	R
cuHRe	$(Y_u^\dagger)_{pr}(\bar{q}_p \tilde{H} u_r)(H^\dagger H)/TeV^2 + hc$	R
cuHIm	$i(Y_u^\dagger)_{pr}(\bar{q}_p \tilde{H} u_r)(H^\dagger H)/TeV^2 + hc$	R
ctHRe	$(\bar{Q}\tilde{H} t)(H^\dagger H)/TeV^2 + hc$	R
ctHIm	$i(\bar{Q}\tilde{H} t)(H^\dagger H)/TeV^2 + hc$	R
cdHRe	$(Y_d^\dagger)_{pr}(\bar{q}_p H d_r)(H^\dagger H)/TeV^2 + hc$	R
cdHIm	$i(Y_d^\dagger)_{pr}(\bar{q}_p H d_r)(H^\dagger H)/TeV^2 + hc$	R
cbHRe	$(\bar{Q} H b)(H^\dagger H)/TeV^2 + hc$	R
cbHIm	$i(\bar{Q} H b)(H^\dagger H)/TeV^2 + hc$	R
ceWRe11	$(\bar{\ell}_1 \sigma^I H \sigma^{\mu\nu} e_1) W^I_{\mu\nu}/TeV^2 + hc$	R
ceWRe22	$(\bar{\ell}_2 \sigma^I H \sigma^{\mu\nu} e_2) W^I_{\mu\nu}/TeV^2 + hc$	R
ceWRe33	$(\bar{\ell}_3 \sigma^I H \sigma^{\mu\nu} e_3) W^I_{\mu\nu}/TeV^2 + hc$	R
ceWIm11	$i(\bar{\ell}_1 \sigma^I H \sigma^{\mu\nu} e_1) W^I_{\mu\nu}/TeV^2 + hc$	R
ceWIm22	$i(\bar{\ell}_2 \sigma^I H \sigma^{\mu\nu} e_2) W^I_{\mu\nu}/TeV^2 + hc$	R
ceWIm33	$i(\bar{\ell}_3 \sigma^I H \sigma^{\mu\nu} e_3) W^I_{\mu\nu}/TeV^2 + hc$	R
ceBRe11	$(\bar{\ell}_1 H \sigma^{\mu\nu} e_1) B_{\mu\nu}/TeV^2 + hc$	R
ceBRe22	$(\bar{\ell}_2 H \sigma^{\mu\nu} e_2) B_{\mu\nu}/TeV^2 + hc$	R
ceBRe33	$(\bar{\ell}_3 H \sigma^{\mu\nu} e_3) B_{\mu\nu}/TeV^2 + hc$	R
ceBIm11	$i(\bar{\ell}_1 H \sigma^{\mu\nu} e_1) B_{\mu\nu}/TeV^2 + hc$	R
ceBIm22	$i(\bar{\ell}_2 H \sigma^{\mu\nu} e_2) B_{\mu\nu}/TeV^2 + hc$	R
ceBIm33	$i(\bar{\ell}_3 H \sigma^{\mu\nu} e_3) B_{\mu\nu}/TeV^2 + hc$	R
cuGRe	$(Y_u^\dagger)_{pr}(\bar{q}_p \tilde{H} \sigma^{\mu\nu} T^A u_r) G^A_{\mu\nu}/TeV^2 + hc$	R
cuGIm	$i(Y_u^\dagger)_{pr}(\bar{q}_p \tilde{H} \sigma^{\mu\nu} T^A u_r) G^A_{\mu\nu}/TeV^2 + hc$	R
ctGRe	$(\bar{Q}\tilde{H} \sigma^{\mu\nu} T^A t) G^A_{\mu\nu}/TeV^2 + hc$	R
ctGIm	$i(\bar{Q}\tilde{H} \sigma^{\mu\nu} T^A t) G^A_{\mu\nu}/TeV^2 + hc$	R
cuWRe	$(Y_u^\dagger)_{pr}(\bar{q}_p \sigma^I \tilde{H} \sigma^{\mu\nu} u_r) W^I_{\mu\nu}/TeV^2 + hc$	R
cuWIm	$i(Y_u^\dagger)_{pr}(\bar{q}_p \sigma^I \tilde{H} \sigma^{\mu\nu} u_r) W^I_{\mu\nu}/TeV^2 + hc$	R
ctWRe	$(\bar{Q}\sigma^I \tilde{H} \sigma^{\mu\nu} t) W^I_{\mu\nu}/TeV^2 + hc$	R
ctWIm	$i(\bar{Q}\sigma^I \tilde{H} \sigma^{\mu\nu} t) W^I_{\mu\nu}/TeV^2 + hc$	R
cuBRe	$(Y_u^\dagger)_{pr}(\bar{q}_p \tilde{H} \sigma^{\mu\nu} u_r) B_{\mu\nu}/TeV^2 + hc$	R
cuBIm	$i(Y_u^\dagger)_{pr}(\bar{q}_p \tilde{H} \sigma^{\mu\nu} u_r) B_{\mu\nu}/TeV^2 + hc$	R
ctBRe	$(\bar{Q}\tilde{H} \sigma^{\mu\nu} t) B_{\mu\nu}/TeV^2 + hc$	R
ctBIm	$i(\bar{Q}\tilde{H} \sigma^{\mu\nu} t) B_{\mu\nu}/TeV^2 + hc$	R
cdGRe	$(Y_d^\dagger)_{pr}(\bar{q}_p H \sigma^{\mu\nu} T^A d_r) G^A_{\mu\nu}/TeV^2 + hc$	R
cdGIm	$i(Y_d^\dagger)_{pr}(\bar{q}_p H \sigma^{\mu\nu} T^A d_r) G^A_{\mu\nu}/TeV^2 + hc$	R
cbGRe	$(\bar{Q} H \sigma^{\mu\nu} T^A b) G^A_{\mu\nu}/TeV^2 + hc$	R
cbGIm	$i(\bar{Q} H \sigma^{\mu\nu} T^A b) G^A_{\mu\nu}/TeV^2 + hc$	R
cdWRe	$(Y_d^\dagger)_{pr}(\bar{q}_p \sigma^I H \sigma^{\mu\nu} d_r) W^I_{\mu\nu}/TeV^2 + hc$	R

WC name	Operator	Type
cdWIm	$i(Y_d^\dagger)_{pr}(\bar{q}_p\sigma^I H\sigma^{\mu\nu}d_r)W^I_{\mu\nu}/TeV^2 + hc$	R
cbWRe	$(\bar{Q}\sigma^I H\sigma^{\mu\nu}b)W^I_{\mu\nu}/TeV^2 + hc$	R
cbWIm	$i(\bar{Q}\sigma^I H\sigma^{\mu\nu}b)W^I_{\mu\nu}/TeV^2 + hc$	R
cdBRe	$(Y_d^\dagger)_{pr}(\bar{q}_p H\sigma^{\mu\nu}d_r)B_{\mu\nu}/TeV^2 + hc$	R
cdBIm	$i(Y_d^\dagger)_{pr}(\bar{q}_p H\sigma^{\mu\nu}d_r)B_{\mu\nu}/TeV^2 + hc$	R
cbBRe	$(\bar{Q}H\sigma^{\mu\nu}b)B_{\mu\nu}/TeV^2 + hc$	R
cbBIm	$i(\bar{Q}H\sigma^{\mu\nu}b)B_{\mu\nu}/TeV^2 + hc$	R
cHl111	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{\ell}_1\gamma^\mu\ell_1)/TeV^2$	R
cHl122	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{\ell}_2\gamma^\mu\ell_2)/TeV^2$	R
cHl133	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{\ell}_3\gamma^\mu\ell_3)/TeV^2$	R
cHl311	$(H^\dagger i\overleftrightarrow{D}^I_\mu H)(\bar{\ell}_1\gamma^\mu\sigma^I\ell_1)/TeV^2$	R
cHl322	$(H^\dagger i\overleftrightarrow{D}^I_\mu H)(\bar{\ell}_2\gamma^\mu\sigma^I\ell_2)/TeV^2$	R
cHl333	$(H^\dagger i\overleftrightarrow{D}^I_\mu H)(\bar{\ell}_3\gamma^\mu\sigma^I\ell_3)/TeV^2$	R
cHj1	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{q}_p\gamma^\mu q_p)/TeV^2$	R
cHj3	$(H^\dagger i\overleftrightarrow{D}^I_\mu H)(\bar{q}_p\gamma^\mu\sigma^I q_p)/TeV^2$	R
cHQ1	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{Q}\gamma^\mu Q)/TeV^2$	R
cHQ3	$(H^\dagger i\overleftrightarrow{D}^I_\mu H)(\bar{Q}\gamma^\mu\sigma^I Q)/TeV^2$	R
cHe11	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R
cHe22	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cHe33	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cHu	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{u}_p\gamma^\mu u_p)/TeV^2$	R
cHt	$(H^\dagger i\overleftrightarrow{D}^I_\mu H)(\bar{t}\gamma^\mu t)/TeV^2$	R
cHd	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{d}_p\gamma^\mu d_p)/TeV^2$	R
cHbq	$(H^\dagger i\overleftrightarrow{D}_\mu H)(\bar{b}\gamma^\mu b)/TeV^2$	R
cHudRe	$(Y_u Y_d^\dagger)_{pr}(\tilde{H}^\dagger iD_\mu H)(\bar{u}_p\gamma^\mu d_r)/TeV^2 + hc$	R
cHudIm	$i(Y_u Y_d^\dagger)_{pr}(\tilde{H}^\dagger iD_\mu H)(\bar{u}_p\gamma^\mu d_r)/TeV^2 + hc$	R
cHtbRe	$(\tilde{H}^\dagger iD_\mu H)(\bar{t}\gamma^\mu b)/TeV^2 + hc$	R
cHtbIm	$i(\tilde{H}^\dagger iD_\mu H)(\bar{t}\gamma^\mu b)/TeV^2 + hc$	R
cll1111	$(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{\ell}_1\gamma^\mu\ell_1)/TeV^2$	R
cll2222	$(\bar{\ell}_2\gamma_\mu\ell_2)(\bar{\ell}_2\gamma^\mu\ell_2)/TeV^2$	R
cll3333	$(\bar{\ell}_3\gamma_\mu\ell_3)(\bar{\ell}_3\gamma^\mu\ell_3)/TeV^2$	R
cll1122	$(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{\ell}_2\gamma^\mu\ell_2)/TeV^2$	R
cll1133	$(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{\ell}_3\gamma^\mu\ell_3)/TeV^2$	R
cll2233	$(\bar{\ell}_2\gamma_\mu\ell_2)(\bar{\ell}_3\gamma^\mu\ell_3)/TeV^2$	R
cll1221	$(\bar{\ell}_1\gamma_\mu\ell_2)(\bar{\ell}_2\gamma^\mu\ell_1)/TeV^2$	R
cll1331	$(\bar{\ell}_1\gamma_\mu\ell_3)(\bar{\ell}_3\gamma^\mu\ell_1)/TeV^2$	R
cll2332	$(\bar{\ell}_2\gamma_\mu\ell_3)(\bar{\ell}_3\gamma^\mu\ell_2)/TeV^2$	R
clj111	$(\bar{\ell}_1\gamma_\mu\ell_1)(\bar{q}_r\gamma^\mu q_r)/TeV^2$	R
clj122	$(\bar{\ell}_2\gamma_\mu\ell_2)(\bar{q}_r\gamma^\mu q_r)/TeV^2$	R

WC name	Operator	Type
clj133	$(\bar{\ell}_3\gamma_\mu\ell_3)(\bar{q}_r\gamma^\mu q_r)/TeV^2$	R
clj311	$(\bar{\ell}_1\gamma_\mu\sigma^I\ell_1)(\bar{q}_r\gamma^\mu\sigma^I q_r)/TeV^2$	R
clj322	$(\bar{\ell}_2\gamma_\mu\sigma^I\ell_2)(\bar{q}_r\gamma^\mu\sigma^I q_r)/TeV^2$	R
clj333	$(\bar{\ell}_3\gamma_\mu\sigma^I\ell_3)(\bar{q}_r\gamma^\mu\sigma^I q_r)/TeV^2$	R
cQl111	$(\bar{Q}\gamma_\mu Q)(\bar{\ell}_1\gamma^\mu\ell_1)/TeV^2$	R
cQl122	$(\bar{Q}\gamma_\mu Q)(\bar{\ell}_2\gamma^\mu\ell_2)/TeV^2$	R
cQl133	$(\bar{Q}\gamma_\mu Q)(\bar{\ell}_3\gamma^\mu\ell_3)/TeV^2$	R
cQl311	$(\bar{Q}\gamma_\mu\sigma^I Q)(\bar{\ell}_1\gamma^\mu\sigma^I\ell_1)/TeV^2$	R
cQl322	$(\bar{Q}\gamma_\mu\sigma^I Q)(\bar{\ell}_2\gamma^\mu\sigma^I\ell_2)/TeV^2$	R
cQl333	$(\bar{Q}\gamma_\mu\sigma^I Q)(\bar{\ell}_3\gamma^\mu\sigma^I\ell_3)/TeV^2$	R
cjj11	$(\bar{q}_p\gamma_\mu q_p)(\bar{q}_r\gamma^\mu q_r)/TeV^2$	R
cjj18	$(\bar{q}_p\gamma_\mu T^A q_p)(\bar{q}_r\gamma^\mu T^A q_r)/TeV^2$	R
cjj31	$(\bar{q}_p\gamma_\mu\sigma^I q_p)(\bar{q}_r\gamma^\mu\sigma^I q_r)/TeV^2$	R
cjj38	$(\bar{q}_p\gamma_\mu\sigma^I T^A q_p)(\bar{q}_r\gamma^\mu\sigma^I T^A q_r)/TeV^2$	R
cQQ1	$(\bar{Q}\gamma_\mu Q)(\bar{Q}\gamma^\mu Q)/TeV^2$	R
cQQ8	$(\bar{Q}\gamma_\mu T^A Q)(\bar{Q}\gamma^\mu T^A Q)/TeV^2$	R
cQj11	$(\bar{Q}\gamma_\mu Q)(\bar{q}_p\gamma^\mu q_p)/TeV^2$	R
cQj18	$(\bar{Q}\gamma_\mu T^A Q)(\bar{q}_p\gamma^\mu T^A q_p)/TeV^2$	R
cQj31	$(\bar{Q}\gamma_\mu\sigma^I Q)(\bar{q}_p\gamma^\mu\sigma^I q_p)/TeV^2$	R
cQj38	$(\bar{Q}\gamma_\mu\sigma^I T^A Q)(\bar{q}_p\gamma^\mu\sigma^I T^A q_p)/TeV^2$	R
cee1111	$(\bar{e}_1\gamma_\mu e_1)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R
cee2222	$(\bar{e}_2\gamma_\mu e_2)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cee3333	$(\bar{e}_3\gamma_\mu e_3)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cee1122	$(\bar{e}_1\gamma_\mu e_1)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cee1133	$(\bar{e}_1\gamma_\mu e_1)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cee2233	$(\bar{e}_2\gamma_\mu e_2)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cuu1	$(\bar{u}_p\gamma_\mu u_p)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
cuu8	$(\bar{u}_p\gamma_\mu T^A u_p)(\bar{u}_r\gamma^\mu T^A u_r)/TeV^2$	R
ctt	$(\bar{t}\gamma_\mu t)(\bar{t}\gamma^\mu t)/TeV^2$	R
ctu1	$(\bar{t}\gamma_\mu t)(\bar{u}_p\gamma^\mu u_p)/TeV^2$	R
ctu8	$(\bar{t}\gamma_\mu T^A t)(\bar{u}_p\gamma^\mu T^A u_p)/TeV^2$	R
cdd1	$(\bar{d}_p\gamma_\mu d_p)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cdd8	$(\bar{d}_p\gamma_\mu T^A d_p)(\bar{d}_r\gamma^\mu T^A d_r)/TeV^2$	R
cbb	$(\bar{b}\gamma_\mu b)(\bar{b}\gamma^\mu b)/TeV^2$	R
cbd1	$(\bar{b}\gamma_\mu b)(\bar{d}_p\gamma^\mu d_p)/TeV^2$	R
cbd8	$(\bar{b}\gamma_\mu T^A b)(\bar{d}_p\gamma^\mu T^A d_p)/TeV^2$	R
ceu11	$(\bar{e}_1\gamma_\mu e_1)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
ceu22	$(\bar{e}_2\gamma_\mu e_2)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
ceu33	$(\bar{e}_3\gamma_\mu e_3)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
cte11	$(\bar{e}_1\gamma_\mu e_1)(\bar{t}\gamma^\mu t)/TeV^2$	R
cte22	$(\bar{e}_2\gamma_\mu e_2)(\bar{t}\gamma^\mu t)/TeV^2$	R
cte33	$(\bar{e}_3\gamma_\mu e_3)(\bar{t}\gamma^\mu t)/TeV^2$	R
ced11	$(\bar{e}_1\gamma_\mu e_1)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R

WC name	Operator	Type
ced22	$(\bar{e}_2\gamma_\mu e_2)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
ced33	$(\bar{e}_3\gamma_\mu e_3)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cbe11	$(\bar{e}_1\gamma_\mu e_1)(\bar{b}\gamma^\mu b)/TeV^2$	R
cbe22	$(\bar{e}_2\gamma_\mu e_2)(\bar{b}\gamma^\mu b)/TeV^2$	R
cbe33	$(\bar{e}_3\gamma_\mu e_3)(\bar{b}\gamma^\mu b)/TeV^2$	R
cud1	$(\bar{u}_p\gamma_\mu u_p)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
ctd1	$(\bar{t}\gamma_\mu t)(\bar{d}_p\gamma^\mu d_p)/TeV^2$	R
cbu1	$(\bar{u}_p\gamma_\mu u_p)(\bar{b}\gamma^\mu b)/TeV^2$	R
ctb1	$(\bar{t}\gamma_\mu t)(\bar{b}\gamma^\mu b)/TeV^2$	R
cud8	$(\bar{u}_p\gamma_\mu T^A u_p)(\bar{d}_r\gamma^\mu T^A d_r)/TeV^2$	R
ctd8	$(\bar{t}\gamma_\mu T^A t)(\bar{d}_p\gamma^\mu T^A d_p)/TeV^2$	R
cbu8	$(\bar{u}_p\gamma_\mu T^A u_p)(\bar{b}\gamma^\mu T^A b)/TeV^2$	R
ctb8	$(\bar{t}\gamma_\mu T^A t)(\bar{b}\gamma^\mu T^A b)/TeV^2$	R
cutbd1Re	$(Y_u Y_d^\dagger)_{pr}(\bar{u}_p\gamma_\mu t)(\bar{b}\gamma^\mu d_r)/TeV^2 + hc$	R
cutbd1Im	$i(Y_u Y_d^\dagger)_{pr}(\bar{u}_p\gamma_\mu t)(\bar{b}\gamma^\mu d_r)/TeV^2 + hc$	R
cutbd8Re	$(Y_u Y_d^\dagger)_{pr}(\bar{u}_p\gamma_\mu T^A t)(\bar{b}\gamma^\mu T^A d_r)/TeV^2 + hc$	R
cutbd8Im	$i(Y_u Y_d^\dagger)_{pr}(\bar{u}_p\gamma_\mu T^A t)(\bar{b}\gamma^\mu T^A d_r)/TeV^2 + hc$	R
cle1111	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R
cle2222	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cle3333	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cle1122	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cle1133	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cle2211	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R
cle2233	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cle3311	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R
cle3322	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cle1221	$(\bar{\ell}_1\gamma_\mu \ell_2)(\bar{e}_2\gamma^\mu e_1)/TeV^2 + hc$	R
cle1331	$(\bar{\ell}_1\gamma_\mu \ell_3)(\bar{e}_3\gamma^\mu e_1)/TeV^2 + hc$	R
cle2332	$(\bar{\ell}_2\gamma_\mu \ell_3)(\bar{e}_3\gamma^\mu e_2)/TeV^2 + hc$	R
clu11	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
clu22	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
clu33	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
ctl11	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{t}\gamma^\mu t)/TeV^2$	R
ctl22	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{t}\gamma^\mu t)/TeV^2$	R
ctl33	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{t}\gamma^\mu t)/TeV^2$	R
cld11	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cld22	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cld33	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cbl11	$(\bar{\ell}_1\gamma_\mu \ell_1)(\bar{b}\gamma^\mu b)/TeV^2$	R
cbl22	$(\bar{\ell}_2\gamma_\mu \ell_2)(\bar{b}\gamma^\mu b)/TeV^2$	R
cbl33	$(\bar{\ell}_3\gamma_\mu \ell_3)(\bar{b}\gamma^\mu b)/TeV^2$	R
cje11	$(\bar{q}_p\gamma_\mu q_p)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R

WC name	Operator	Type
cje22	$(\bar{q}_p\gamma_\mu q_p)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cje33	$(\bar{q}_p\gamma_\mu q_p)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cQe11	$(\bar{Q}\gamma_\mu Q)(\bar{e}_1\gamma^\mu e_1)/TeV^2$	R
cQe22	$(\bar{Q}\gamma_\mu Q)(\bar{e}_2\gamma^\mu e_2)/TeV^2$	R
cQe33	$(\bar{Q}\gamma_\mu Q)(\bar{e}_3\gamma^\mu e_3)/TeV^2$	R
cju1	$(\bar{q}_p\gamma_\mu q_p)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
cQu1	$(\bar{Q}\gamma_\mu Q)(\bar{u}_r\gamma^\mu u_r)/TeV^2$	R
ctj1	$(\bar{q}_p\gamma_\mu q_p)(\bar{t}\gamma^\mu t)/TeV^2$	R
cQt1	$(\bar{Q}\gamma_\mu Q)(\bar{t}\gamma^\mu t)/TeV^2$	R
cju8	$(\bar{q}_p\gamma_\mu T^A q_p)(\bar{u}_r\gamma^\mu T^A u_r)/TeV^2$	R
cQu8	$(\bar{Q}\gamma_\mu T^A Q)(\bar{u}_r\gamma^\mu T^A u_r)/TeV^2$	R
ctj8	$(\bar{q}_p\gamma_\mu T^A q_p)(\bar{t}\gamma^\mu T^A t)/TeV^2$	R
cQt8	$(\bar{Q}\gamma_\mu T^A Q)(\bar{t}\gamma^\mu T^A t)/TeV^2$	R
cjd1	$(\bar{q}_p\gamma_\mu q_p)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cQd1	$(\bar{Q}\gamma_\mu Q)(\bar{d}_r\gamma^\mu d_r)/TeV^2$	R
cbj1	$(\bar{q}_p\gamma_\mu q_p)(\bar{b}\gamma^\mu b)/TeV^2$	R
cQb1	$(\bar{Q}\gamma_\mu Q)(\bar{b}\gamma^\mu b)/TeV^2$	R
cjd8	$(\bar{q}_p\gamma_\mu T^A q_p)(\bar{d}_r\gamma^\mu T^A d_r)/TeV^2$	R
cQd8	$(\bar{Q}\gamma_\mu T^A Q)(\bar{d}_r\gamma^\mu T^A d_r)/TeV^2$	R
cbj8	$(\bar{q}_p\gamma_\mu T^A q_p)(\bar{b}\gamma^\mu T^A b)/TeV^2$	R
cQb8	$(\bar{Q}\gamma_\mu T^A Q)(\bar{b}\gamma^\mu T^A b)/TeV^2$	R
cjQtu1Re	$(Y_u^\dagger)_{pr}(\bar{q}_p\gamma_\mu Q)(\bar{t}\gamma^\mu u_r)/TeV^2 + hc$	R
cjQtu1Im	$i(Y_u^\dagger)_{pr}(\bar{q}_p\gamma_\mu Q)(\bar{t}\gamma^\mu u_r)/TeV^2 + hc$	R
cjQtu8Re	$(Y_u^\dagger)_{pr}(\bar{q}_p\gamma_\mu T^A Q)(\bar{t}\gamma^\mu T^A u_r)/TeV^2 + hc$	R
cjQtu8Im	$i(Y_u^\dagger)_{pr}(\bar{q}_p\gamma_\mu T^A Q)(\bar{t}\gamma^\mu T^A u_r)/TeV^2 + hc$	R
cjQbd1Re	$(Y_d^\dagger)_{pr}(\bar{q}_p\gamma_\mu Q)(\bar{b}\gamma^\mu d_r)/TeV^2 + hc$	R
cjQbd1Im	$i(Y_d^\dagger)_{pr}(\bar{q}_p\gamma_\mu Q)(\bar{b}\gamma^\mu d_r)/TeV^2 + hc$	R
cjQbd8Re	$(Y_d^\dagger)_{pr}(\bar{q}_p\gamma_\mu T^A Q)(\bar{b}\gamma^\mu T^A d_r)/TeV^2 + hc$	R
cjQbd8Im	$i(Y_d^\dagger)_{pr}(\bar{q}_p\gamma_\mu T^A Q)(\bar{b}\gamma^\mu T^A d_r)/TeV^2 + hc$	R
cledjRe11	$Y_{d,st}(\bar{\ell}_1^I e_1)(\bar{d}_s q_t^I)/TeV^2 + hc$	R
cledjRe22	$Y_{d,st}(\bar{\ell}_2^I e_2)(\bar{d}_s q_t^I)/TeV^2 + hc$	R
cledjRe33	$Y_{d,st}(\bar{\ell}_3^I e_3)(\bar{d}_s q_t^I)/TeV^2 + hc$	R
cledjIm11	$iY_{d,st}(\bar{\ell}_1^I e_1)(\bar{d}_s q_t^I)/TeV^2 + hc$	R
cledjIm22	$iY_{d,st}(\bar{\ell}_2^I e_2)(\bar{d}_s q_t^I)/TeV^2 + hc$	R
cledjIm33	$iY_{d,st}(\bar{\ell}_3^I e_3)(\bar{d}_s q_t^I)/TeV^2 + hc$	R
clebQRe11	$(\bar{\ell}_1^I e_1)(\bar{b}Q^I)/TeV^2 + hc$	R
clebQRe22	$(\bar{\ell}_2^I e_2)(\bar{b}Q^I)/TeV^2 + hc$	R
clebQRe33	$(\bar{\ell}_3^I e_3)(\bar{b}Q^I)/TeV^2 + hc$	R
clebQIm11	$i(\bar{\ell}_1^I e_1)(\bar{b}Q^I)/TeV^2 + hc$	R
clebQIm22	$i(\bar{\ell}_2^I e_2)(\bar{b}Q^I)/TeV^2 + hc$	R
clebQIm33	$i(\bar{\ell}_3^I e_3)(\bar{b}Q^I)/TeV^2 + hc$	R
cjujd1Re	$(Y_u^\dagger)_{pr}(Y_d^\dagger)_{st}(\bar{q}_p^I u_r)(\bar{q}_s^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R

WC name	Operator	Type
cjujd1Im	$i(Y_u^\dagger)_{pr}(Y_d^\dagger)_{st}(\bar{q}_p^I u_r)(\bar{q}_s^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjujd11Re	$(Y_u^\dagger)_{sr}(Y_d^\dagger)_{pt}(\bar{q}_p^I u_r)(\bar{q}_s^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjujd11Im	$i(Y_u^\dagger)_{sr}(Y_d^\dagger)_{pt}(\bar{q}_p^I u_r)(\bar{q}_s^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtjd1Re	$(Y_d^\dagger)_{st}(\bar{Q}^I t)(\bar{q}_s^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtjd1Im	$i(Y_d^\dagger)_{st}(\bar{Q}^I t)(\bar{q}_s^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjuQb1Re	$(Y_u^\dagger)_{pr}(\bar{q}_p^I u_r)(\bar{Q}^J b)\varepsilon_{IJ}/TeV^2 + hc$	R
cjuQb1Im	$i(Y_u^\dagger)_{pr}(\bar{q}_p^I u_r)(\bar{Q}^J b)\varepsilon_{IJ}/TeV^2 + hc$	R
cQujb1Re	$(Y_u^\dagger)_{sr}(\bar{Q}^I u_r)(\bar{q}_s^J b)\varepsilon_{IJ}/TeV^2 + hc$	R
cQujb1Im	$i(Y_u^\dagger)_{sr}(\bar{Q}^I u_r)(\bar{q}_s^J b)\varepsilon_{IJ}/TeV^2 + hc$	R
cjtQd1Re	$(Y_d^\dagger)_{pt}(\bar{q}_p^I t)(\bar{Q}^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjtQd1Im	$i(Y_d^\dagger)_{pt}(\bar{q}_p^I t)(\bar{Q}^J d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtQb1Re	$(\bar{Q}^I t)(\bar{Q}^J b)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtQb1Im	$i(\bar{Q}^I t)(\bar{Q}^J b)\varepsilon_{IJ}/TeV^2 + hc$	R
cjujd8Re	$(Y_u^\dagger)_{pr}(Y_d^\dagger)_{st}(\bar{q}_p^I T^A u_r)(\bar{q}_s^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjujd8Im	$i(Y_u^\dagger)_{pr}(Y_d^\dagger)_{st}(\bar{q}_p^I T^A u_r)(\bar{q}_s^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjujd81Re	$(Y_u^\dagger)_{sr}(Y_d^\dagger)_{pt}(\bar{q}_p^I T^A u_r)(\bar{q}_s^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjujd81Im	$i(Y_u^\dagger)_{sr}(Y_d^\dagger)_{pt}(\bar{q}_p^I T^A u_r)(\bar{q}_s^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtjd8Re	$(Y_d^\dagger)_{st}(\bar{Q}^I T^A t)(\bar{q}_s^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtjd8Im	$i(Y_d^\dagger)_{st}(\bar{Q}^I T^A t)(\bar{q}_s^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjuQb8Re	$(Y_u^\dagger)_{pr}(\bar{q}_p^I T^A u_r)(\bar{Q}^J T^A b)\varepsilon_{IJ}/TeV^2 + hc$	R
cjuQb8Im	$i(Y_u^\dagger)_{pr}(\bar{q}_p^I T^A u_r)(\bar{Q}^J T^A b)\varepsilon_{IJ}/TeV^2 + hc$	R
cQujb8Re	$(Y_u^\dagger)_{sr}(\bar{Q}^I T^A u_r)(\bar{q}_s^J T^A b)\varepsilon_{IJ}/TeV^2 + hc$	R
cQujb8Im	$i(Y_u^\dagger)_{sr}(\bar{Q}^I T^A u_r)(\bar{q}_s^J T^A b)\varepsilon_{IJ}/TeV^2 + hc$	R
cjtQd8Re	$(Y_d^\dagger)_{pt}(\bar{q}_p^I T^A t)(\bar{Q}^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cjtQd8Im	$i(Y_d^\dagger)_{pt}(\bar{q}_p^I T^A t)(\bar{Q}^J T^A d_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtQb8Re	$(\bar{Q}^I T^A t)(\bar{Q}^J T^A b)\varepsilon_{IJ}/TeV^2 + hc$	R
cQtQb8Im	$i(\bar{Q}^I T^A t)(\bar{Q}^J T^A b)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju1Re11	$(Y_u^\dagger)_{st}(\bar{\ell}_1^I e_1)(\bar{q}_s^J u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju1Re22	$(Y_u^\dagger)_{st}(\bar{\ell}_2^I e_2)(\bar{q}_s^J u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju1Re33	$(Y_u^\dagger)_{st}(\bar{\ell}_3^I e_3)(\bar{q}_s^J u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju1Im11	$i(Y_u^\dagger)_{st}(\bar{\ell}_1^I e_1)(\bar{q}_s^J u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju1Im22	$i(Y_u^\dagger)_{st}(\bar{\ell}_2^I e_2)(\bar{q}_s^J u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju1Im33	$i(Y_u^\dagger)_{st}(\bar{\ell}_3^I e_3)(\bar{q}_s^J u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleQt1Re11	$(\bar{\ell}_1^I e_1)(\bar{Q}^J t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleQt1Re22	$(\bar{\ell}_2^I e_2)(\bar{Q}^J t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleQt1Re33	$(\bar{\ell}_3^I e_3)(\bar{Q}^J t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleQt1Im11	$i(\bar{\ell}_1^I e_1)(\bar{Q}^J t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleQt1Im22	$i(\bar{\ell}_2^I e_2)(\bar{Q}^J t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleQt1Im33	$i(\bar{\ell}_3^I e_3)(\bar{Q}^J t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju3Re11	$(Y_u^\dagger)_{st}(\bar{\ell}_1^I \sigma_{\mu\nu} e_1)(\bar{q}_s^J \sigma^{\mu\nu} u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
cleju3Re22	$(Y_u^\dagger)_{st}(\bar{\ell}_2^I \sigma_{\mu\nu} e_2)(\bar{q}_s^J \sigma^{\mu\nu} u_t)\varepsilon_{IJ}/TeV^2 + hc$	R

WC name	Operator	Type
`cleju3Re33`	$(Y_u^\dagger)_{st}(\bar{\ell}_3^I\sigma_{\mu\nu}e_3)(\bar{q}_s^J\sigma^{\mu\nu}u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleju3Im11`	$i(Y_u^\dagger)_{st}(\bar{\ell}_1^I\sigma_{\mu\nu}e_1)(\bar{q}_s^J\sigma^{\mu\nu}u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleju3Im22`	$i(Y_u^\dagger)_{st}(\bar{\ell}_2^I\sigma_{\mu\nu}e_2)(\bar{q}_s^J\sigma^{\mu\nu}u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleju3Im33`	$i(Y_u^\dagger)_{st}(\bar{\ell}_3^I\sigma_{\mu\nu}e_3)(\bar{q}_s^J\sigma^{\mu\nu}u_t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleQt3Re11`	$(\bar{\ell}_1^I\sigma_{\mu\nu}e_1)(\bar{Q}^J\sigma^{\mu\nu}t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleQt3Re22`	$(\bar{\ell}_2^I\sigma_{\mu\nu}e_2)(\bar{Q}^J\sigma^{\mu\nu}t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleQt3Re33`	$(\bar{\ell}_3^I\sigma_{\mu\nu}e_3)(\bar{Q}^J\sigma^{\mu\nu}t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleQt3Im11`	$i(\bar{\ell}_1^I\sigma_{\mu\nu}e_1)(\bar{Q}^J\sigma^{\mu\nu}t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleQt3Im22`	$i(\bar{\ell}_2^I\sigma_{\mu\nu}e_2)(\bar{Q}^J\sigma^{\mu\nu}t)\varepsilon_{IJ}/TeV^2 + hc$	R
`cleQt3Im33`	$i(\bar{\ell}_3^I\sigma_{\mu\nu}e_3)(\bar{Q}^J\sigma^{\mu\nu}t)\varepsilon_{IJ}/TeV^2 + hc$	R