# Basis flavio (EFT WET-3)

# Sectors

The effective Lagrangian is defined as

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

sdsd

| WC name   | Operator   | Type         |
|-----------|--|--------------|
| CVLL_sdsd | $(\bar{d}_L \gamma^\mu s_L)(\bar{d}_L \gamma_\mu s_L)$           | С            |
| CVRR_sdsd | $(\bar{d}_R \gamma^\mu s_R)(\bar{d}_R \gamma_\mu s_R)$           | $\mathbf{C}$ |
| CSLL_sdsd | $(ar{d}_R s_L)(ar{d}_R s_L)$                                     | $\mathbf{C}$ |
| CSRR_sdsd | $(ar{d}_L s_R)(ar{d}_L s_R)$                                     | $\mathbf{C}$ |
| CTLL_sdsd | $(\bar{d}_R \sigma^{\mu\nu} s_L)(\bar{d}_R \sigma_{\mu\nu} s_L)$ | $\mathbf{C}$ |
| CTRR_sdsd | $(\bar{d}_L \sigma^{\mu\nu} s_R)(\bar{d}_L \sigma_{\mu\nu} s_R)$ | $\mathbf{C}$ |
| CVLR_sdsd | $(\bar{d}_L \gamma^\mu s_L)(\bar{d}_R \gamma_\mu s_R)$           | $\mathbf{C}$ |
| CSLR_sdsd | $(ar{d}_R s_L)(ar{d}_L s_R)$                                     | $\mathbf{C}$ |

sd

| WC name     | Operator   | Type         |
|-------------|--|--------------|
| C9_sdee     | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}(\bar{d}_L\gamma^{\mu}s_L)(\bar{e}\gamma_{\mu}e)$                                   | C            |
| C9p_sdee    | $\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{ts}V_{td}^{*}\frac{e^{2}}{16\pi^{2}}(\bar{d}_{R}\gamma^{\mu}s_{R})(\bar{e}\gamma_{\mu}e)$               | $\mathbf{C}$ |
| C10_sdee    | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}(\bar{d}_L\gamma^{\mu}s_L)(\bar{e}\gamma_{\mu}\gamma_5 e)$                          | $\mathbf{C}$ |
| C10p_sdee   | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}(\bar{d}_R\gamma^{\mu}s_R)(\bar{e}\gamma_{\mu}\gamma_5 e)$                          | $\mathbf{C}$ |
| CS_sdee     | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_Ls_R)(\bar{e}e)$  | $\mathbf{C}$ |
| CSp_sdee    | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_Rs_L)(\bar{e}e)$  | $\mathbf{C}$ |
| CP_sdee     | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_L s_R)(\bar{e}\gamma_5 e)$  | $\mathbf{C}$ |
| CPp_sdee    | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_R s_L)(\bar{e}\gamma_5 e)$  | $\mathbf{C}$ |
| C9_sdmumu   | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}(\bar{d}_L\gamma^{\mu}s_L)(\bar{\mu}\gamma_{\mu}\mu)$                               | $\mathbf{C}$ |
| C9p_sdmumu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}(\bar{d}_R\gamma^{\mu}s_R)(\bar{\mu}\gamma_{\mu}\mu)$                               | $\mathbf{C}$ |
| C10_sdmumu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}(\bar{d}_L\gamma^{\mu}s_L)(\bar{\mu}\gamma_{\mu}\gamma_5\mu)$                       | $\mathbf{C}$ |
| C10p_sdmumu | $\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{ts}V_{td}^{*}\frac{e^{2}}{16\pi^{2}}(\bar{d}_{R}\gamma^{\mu}s_{R})(\bar{\mu}\gamma_{\mu}\gamma_{5}\mu)$ | $\mathbf{C}$ |
| CS_sdmumu   | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_L s_R)(\bar{\mu}\mu)$   | $\mathbf{C}$ |

| WC name    | Operator  | Type            |
|------------|---|-----------------|
| CSp_sdmumu | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_Rs_L)(\bar{\mu}\mu)$   | $\mathbf{C}$    |
| CP_sdmumu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e^2}{16\pi^2}m_s(\bar{d}_L s_R)(\bar{\mu}\gamma_5\mu)$  | $^{\mathrm{C}}$ |
| CPp_sdmumu | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*rac{e^2}{16\pi^2}m_s(\bar{d}_Rs_L)(\bar{\mu}\gamma_5\mu)$   | $\mathbf{C}$    |
| C7_sd      | $\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{ts}V_{td}^{*}\frac{e}{16\pi^{2}}m_{s}(\bar{d}_{L}\sigma^{\mu\nu}s_{R})F_{\mu\nu}$  | $\mathbf{C}$    |
| C7p_sd     | $\frac{4\overleftarrow{G}_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{e}{16\pi^2}m_s(\bar{d}_R\sigma^{\mu\nu}s_L)F_{\mu\nu}$  | $^{\mathrm{C}}$ |
| C8_sd      | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{g_s}{16\pi^2}m_s(\bar{d}_L\sigma^{\mu\nu}T^as_R)G_{\mu\nu}^a$   | $^{\mathrm{C}}$ |
| C8p_sd     | $\frac{\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*\frac{g_s}{16\pi^2}m_s(\bar{d}_R\sigma^{\mu\nu}T^as_L)G_{\mu\nu}^a}{\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_L\gamma^{\mu}s_L)(\bar{s}_L\gamma_{\mu}s_L)}$   | $^{\mathrm{C}}$ |
| CVLL_sdss  | $rac{4ar{G_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L\gamma^\mu s_L)(ar{s}_L\gamma_\mu s_L)$  | $^{\mathrm{C}}$ |
| CVLR_sdss  | $\frac{4G_F}{\overline{c}}V_{ts}V_{ts}^*(\bar{d}_L\gamma^{\mu}s_L)(\bar{s}_R\gamma_{\mu}s_R)$   | $\mathbf{C}$    |
| CVRL_sdss  | $rac{4ar{G_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\gamma^\mu s_R)(ar{s}_L\gamma_\mu s_L)$  | $\mathbf{C}$    |
| CVRR_sdss  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\gamma^{\mu}s_R)(ar{s}_L\gamma_{\mu}s_L) \ rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\gamma^{\mu}s_R)(ar{s}_R\gamma_{\mu}s_R)$   | $\mathbf{C}$    |
| CSLL_sdss  | $rac{4ar{G_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Rs_L)(ar{s}_Rs_L) \ rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Rs_L)(ar{s}_Ls_R) \ rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Rs_L)(ar{s}_Ls_R)$  | $\mathbf{C}$    |
| CSLR_sdss  | $rac{4ar{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Rs_L)(ar{s}_Ls_R)$  | $\mathbf{C}$    |
| CSRL_sdss  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(d_Ls_R)(\bar{s}_Rs_L)$   | $\mathbf{C}$    |
| CSRR_sdss  | $\frac{\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{ts}V_{td}^{*}(\bar{d}_{L}s_{R})(\bar{s}_{L}s_{R})}{\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{ts}V_{td}^{*}(\bar{d}_{R}\sigma^{\mu\nu}s_{L})(\bar{s}_{R}\sigma_{\mu\nu}s_{L})}$   | $\mathbf{C}$    |
| CTLL_sdss  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\sigma^{\mu u}s_L)(ar{s}_R\sigma_{\mu u}s_L)$  | $\mathbf{C}$    |
| CTRR_sdss  | $rac{4ar{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L\sigma^{\mu u}s_R)(ar{s}_L\sigma_{\mu u}s_R)$  | $\mathbf{C}$    |
| CVLL_sddd  | $rac{4ar{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L\gamma^\mu s_L)(ar{d}_L\gamma_\mu d_L)$  | $\mathbf{C}$    |
| CVLR_sddd  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L\gamma^\mu s_L)(ar{d}_R\gamma_\mu d_R)$  | $\mathbf{C}$    |
| CVRL_sddd  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\gamma^\mu s_R)(ar{d}_L\gamma_\mu d_L)$  | $^{\mathrm{C}}$ |
| CVRR_sddd  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\gamma^\mu s_R)(ar{d}_R\gamma_\mu d_R)$  | $^{\mathrm{C}}$ |
| CSLL_sddd  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(d_Rs_L)(d_Rd_L)$   | $\mathbf{C}$    |
| CSLR_sddd  | $rac{4reve{G}_F^*}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Rs_L)(ar{d}_Ld_R)$  | $\mathbf{C}$    |
| CSRL_sddd  | $rac{\sqrt{2}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L s_R)(ar{d}_R d_L)$  | $\mathbf{C}$    |
| CSRR_sddd  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Ls_R)(ar{d}_Ld_R)$  | $\mathbf{C}$    |
| CTLL_sddd  | $rac{4ar{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\sigma^{\mu u}s_L)(ar{d}_R\sigma_{\mu u}d_L)$  | $^{\mathrm{C}}$ |
| CTRR_sddd  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L\sigma^{\mu u}s_R)(ar{d}_L\sigma_{\mu u}d_R)$  | $\mathbf{C}$    |
| CVLL_sduu  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L\gamma^\mu s_L)(ar{u}_L\gamma_\mu u_L)$  | $\mathbf{C}$    |
| CVLR_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_L\gamma^{\mu}s_L)(\bar{u}_R\gamma_{\mu}u_R)$   | $\mathbf{C}$    |
| CVRL_sduu  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R\gamma^\mu s_R)(ar{u}_L\gamma_\mu u_L)$  | $\mathbf{C}$    |
| CVRR_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_R\gamma^\mu s_R)(\bar{u}_R\gamma_\mu u_R)$   | $\mathbf{C}$    |
| CSLL_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Rs_L)(\bar{u}_Ru_L)$   | $\mathbf{C}$    |
| CSLR_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Rs_L)(\bar{u}_Lu_R)$   | $\mathbf{C}$    |
| CSRL_sduu  | $rac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_Ls_R)(ar{u}_Ru_L)$  | $\mathbf{C}$    |
| CSRR_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_L s_R)(\bar{u}_L u_R)$   | $\mathbf{C}$    |
| CTLL_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_R\gamma^{\mu}s_R)(\bar{u}_L\gamma_{\mu}u_L)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_R\gamma^{\mu}s_R)(\bar{u}_R\gamma_{\mu}u_R)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Rs_L)(\bar{u}_Ru_L)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Rs_L)(\bar{u}_Lu_R)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Ls_R)(\bar{u}_Lu_R)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Ls_R)(\bar{u}_Ru_L)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_Ls_R)(\bar{u}_Lu_R)$ $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_R\sigma^{\mu\nu}s_L)(\bar{u}_R\sigma_{\mu\nu}u_L)$ | $\mathbf{C}$    |

| WC name    | Operator  | Type         |
|------------|---|--------------|
| CTRR_sduu  | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_L\sigma^{\mu\nu}s_R)(\bar{u}_L\sigma_{\mu\nu}u_R)$                             | С            |
| CVLLt_sduu | $rac{4\overset{\circ}{Q_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L^lpha\gamma^\mu s_L^eta)(ar{u}_L^eta\gamma_\mu u_L^lpha)$       | $\mathbf{C}$ |
| CVLRt_sduu | $\frac{4\check{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_L^{lpha}\gamma^{\mu}s_L^{eta})(\bar{u}_R^{eta}\gamma_{\mu}u_R^{lpha})$ | $\mathbf{C}$ |
| CVRLt_sduu | $rac{4ar{G_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R^lpha\gamma^\mu s_R^eta)(ar{u}_L^eta\gamma_\mu u_L^lpha)$                    | $\mathbf{C}$ |
| CVRRt_sduu | $rac{4\dot{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R^lpha\gamma^\mu s_R^eta)(ar{u}_R^eta\gamma_\mu u_R^lpha)$                  | $\mathbf{C}$ |
| CSLLt_sduu | $rac{4\dot{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R^lpha s_L^eta)(ar{u}_R^eta u_L^lpha)$                                      | $\mathbf{C}$ |
| CSLRt_sduu | $rac{4\dot{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R^lpha s_L^eta)(ar{u}_L^eta u_R^lpha)$                                      | $\mathbf{C}$ |
| CSRLt_sduu | $rac{4\dot{G}_F}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L^lpha s_R^eta)(ar{u}_R^eta u_L^lpha)$                                      | $\mathbf{C}$ |
| CSRRt_sduu | $rac{4ar{G_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_L^lpha s_R^eta)(ar{u}_L^eta u_R^lpha)$  | $\mathbf{C}$ |
| CTLLt_sduu | $rac{4\dot{G_F}}{\sqrt{2}}V_{ts}V_{td}^*(ar{d}_R^lpha\sigma^{\mu u}s_L^eta)(ar{u}_R^eta\sigma_{\mu u}u_L^lpha)$            | $\mathbf{C}$ |
| CTRRt_sduu | $\frac{4G_F}{\sqrt{2}}V_{ts}V_{td}^*(\bar{d}_L^\alpha\sigma^{\mu\nu}s_R^\beta)(\bar{u}_L^\beta\sigma_{\mu\nu}u_R^\alpha)$   | $\mathbf{C}$ |

# sdnunu

| WC name                | Operator  | Type         |
|------------------------|---|--------------|
| CL_sdnuenue            | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^{\mu} d_L) (\bar{\nu}_e \gamma_{\mu} (1 - \gamma_5) \nu_e)$        | C            |
| ${\tt CL\_sdnumunumu}$ | $rac{4G_F}{\sqrt{2}}V_{td}V_{ts}^*rac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{ u}_{\mu}\gamma_{\mu}(1-\gamma_5) u_{\mu})$              | $\mathbf{C}$ |
| CL_sdnutaunutau        | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_{\tau}\gamma_{\mu}(1-\gamma_5)\nu_{\tau})$        | $\mathbf{C}$ |
| CL_sdnuenumu           | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_{\mu}\gamma_{\mu}(1-\gamma_5)\nu_e)$        | $\mathbf{C}$ |
| CL_sdnumunue           | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_e\gamma_{\mu}(1-\gamma_5)\nu_{\mu})$        | $\mathbf{C}$ |
| CL_sdnumunutau         | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_{\tau}\gamma_{\mu}(1-\gamma_5)\nu_{\mu})$         | $\mathbf{C}$ |
| CL_sdnutaunumu         | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^* \frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_{\mu}\gamma_{\mu}(1-\gamma_5)\nu_{\tau})$        | $\mathbf{C}$ |
| CL_sdnuenutau          | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_{\tau}\gamma_{\mu}(1-\gamma_5)\nu_e)$       | $\mathbf{C}$ |
| CL_sdnutaunue          | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}d_L)(\bar{\nu}_e\gamma_{\mu}(1-\gamma_5)\nu_{\tau})$       | $\mathbf{C}$ |
| CR_sdnuenue            | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_e\gamma_{\mu}(1-\gamma_5)\nu_e)$            | $\mathbf{C}$ |
| CR_sdnumunumu          | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_{\mu}\gamma_{\mu}(1-\gamma_5)\nu_{\mu})$    | $\mathbf{C}$ |
| CR_sdnutaunutau        | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^* \frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_{\tau}\gamma_{\mu}(1-\gamma_5)\nu_{\tau})$ | $\mathbf{C}$ |
| CR_sdnuenumu           | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_{\mu}\gamma_{\mu}(1-\gamma_5)\nu_e)$        | $\mathbf{C}$ |
| CR_sdnumunue           | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_e\gamma_{\mu}(1-\gamma_5)\nu_{\mu})$        | $\mathbf{C}$ |
| CR_sdnumunutau         | $\frac{4\dot{G}_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_{\tau}\gamma_{\mu}(1-\gamma_5)\nu_{\mu})$   | $\mathbf{C}$ |
| CR_sdnutaunumu         | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^{\mu}d_R)(\bar{\nu}_{\mu}\gamma_{\mu}(1-\gamma_5)\nu_{\tau})$         | $\mathbf{C}$ |
| CR_sdnuenutau          | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^\mu d_R)(\bar{\nu}_\tau\gamma_\mu(1-\gamma_5)\nu_e)$                  | $\mathbf{C}$ |
| CR_sdnutaunue          | $\frac{4G_F}{\sqrt{2}}V_{td}V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^{\mu} d_R) (\bar{\nu}_e \gamma_{\mu} (1 - \gamma_5) \nu_{\tau})$   | $\mathbf{C}$ |

#### usenu

| WC name      | Operator  | Type            |
|--------------|---|-----------------|
| CVL_suenue   | $-\frac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_L\gamma^{\mu}s_L)(\bar{e}_L\gamma_{\mu}\nu_{eL})$                   | C               |
| CVR_suenue   | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{us}(ar{u}_R\gamma^\mu s_R)(ar{e}_L\gamma_\mu u_{eL})$                      | $^{\mathrm{C}}$ |
| CSR_suenue   | $-\frac{4\widetilde{G}_F}{\sqrt{2}}V_{us}(\bar{u}_L s_R)(\bar{e}_R \nu_{eL})$                             | $\mathbf{C}$    |
| CSL_suenue   | $-\frac{4\widetilde{G}_F}{\sqrt{2}}V_{us}(\bar{u}_Rs_L)(\bar{e}_R\nu_{eL})$                               | $\mathbf{C}$    |
| CT_suenue    | $-rac{4ar{Q}_F}{\sqrt{2}}V_{us}(ar{u}_R\sigma^{\mu u}s_L)(ar{e}_R\sigma_{\mu u} u_{eL})$                 | $\mathbf{C}$    |
| CVL_suenumu  | $-rac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_L\gamma^\mu s_L)(\bar{e}_L\gamma_\mu u_{\mu L})$                     | $\mathbf{C}$    |
| CVR_suenumu  | $-rac{4ar{G_F}}{\sqrt{2}}V_{us}(ar{u}_R\gamma^\mu s_R)(ar{e}_L\gamma_\mu u_{\mu L})$                     | $\mathbf{C}$    |
| CSR_suenumu  | $-\frac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_L s_R)(\bar{e}_R \nu_{\mu L})$                                      | $\mathbf{C}$    |
| CSL_suenumu  | $-\frac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_Rs_L)(\bar{e}_R\nu_{\mu L})$  | $\mathbf{C}$    |
| CT_suenumu   | $-rac{4G_F}{\sqrt{2}}V_{us}(ar{u}_R\sigma^{\mu u}s_L)(ar{e}_R\sigma_{\mu u} u_{\mu L})$                  | $\mathbf{C}$    |
| CVL_suenutau | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{us}(ar{u}_L\gamma^\mu s_L)(ar{e}_L\gamma_\mu u_{	au L})$                   | $\mathbf{C}$    |
| CVR_suenutau | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{us}(ar{u}_R\gamma^\mu s_R)(ar{e}_L\gamma_\mu u_{	au L})$                   | $\mathbf{C}$    |
| CSR_suenutau | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{us}(ar{u}_Ls_R)(ar{e}_R u_{	au L})$  | $\mathbf{C}$    |
| CSL_suenutau | $-rac{4\overset{\circ}{Q_F}}{\sqrt{2}}V_{us}(ar{u}_Rs_L)(ar{e}_R u_{	au L})$                             | $\mathbf{C}$    |
| CT_suenutau  | $-\frac{4\tilde{G}_F}{\sqrt{2}}V_{us}(\bar{u}_R\sigma^{\mu\nu}s_L)(\bar{e}_R\sigma_{\mu\nu}\nu_{\tau L})$ | C               |

#### usmunu

| WC name       | Operator  | Type         |
|---------------|---|--------------|
| CVL_sumunue   | $-\frac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_L\gamma^{\mu}s_L)(\bar{\mu}_L\gamma_{\mu}\nu_{eL})$                   | C            |
| CVR_sumunue   | $-rac{4ar{G}_F}{\sqrt{2}}V_{us}(ar{u}_R\gamma^\mu s_R)(ar{\mu}_L\gamma_\mu u_{eL})$                        | $\mathbf{C}$ |
| CSR_sumunue   | $-\frac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_L s_R)(\bar{\mu}_R \nu_{eL})$   | $\mathbf{C}$ |
| CSL_sumunue   | $-rac{4ar{G}_F}{\sqrt{2}}V_{us}(ar{u}_Rs_L)(ar{\mu}_R u_{eL})$   | $\mathbf{C}$ |
| CT_sumunue    | $-rac{4ar{G}_F}{\sqrt{2}}V_{us}(ar{u}_R\sigma^{\mu u}s_L)(ar{\mu}_R\sigma_{\mu u} u_{eL})$                 | $\mathbf{C}$ |
| CVL_sumunumu  | $-\frac{4G_F}{\sqrt{2}}V_{us}(\bar{u}_L\gamma^\mu s_L)(\bar{\mu}_L\gamma_\mu  u_{\mu L})$                   | $\mathbf{C}$ |
| CVR_sumunumu  | $-rac{4ar{G}_F}{\sqrt{2}}V_{us}(ar{u}_R\gamma^\mu s_R)(ar{\mu}_L\gamma_\mu u_{\mu L})$                     | $\mathbf{C}$ |
| CSR_sumunumu  | $-rac{4G_F}{\sqrt{2}}V_{us}(ar{u}_L s_R)(ar{\mu}_R  u_{\mu L})$  | $\mathbf{C}$ |
| CSL_sumunumu  | $-rac{4G_F}{\sqrt{2}}V_{us}(ar{u}_Rs_L)(ar{\mu}_R u_{\mu L})$  | $\mathbf{C}$ |
| CT_sumunumu   | $-rac{4ar{G}_F}{\sqrt{2}}V_{us}(ar{u}_R\sigma^{\mu u}s_L)(ar{\mu}_R\sigma_{\mu u} u_{\mu L})$              | $\mathbf{C}$ |
| CVL_sumunutau | $-rac{4G_F}{\sqrt{2}}V_{us}(ar{u}_L\gamma^\mu s_L)(ar{\mu}_L\gamma_\mu u_{	au L})$                         | $\mathbf{C}$ |
| CVR_sumunutau | $-rac{4ar{G}_F^F}{\sqrt{2}}V_{us}(ar{u}_R\gamma^\mu s_R)(ar{\mu}_L\gamma_\mu u_{	au L})$                   | $\mathbf{C}$ |
| CSR_sumunutau | $-rac{4ar{G}_F^F}{\sqrt{2}}V_{us}(ar{u}_L s_R)(ar{\mu}_R  u_{	au L})$                                      | $\mathbf{C}$ |
| CSL_sumunutau | $-rac{4G_F^c}{\sqrt{2}}V_{us}(ar{u}_Rs_L)(ar{\mu}_R u_{	au L})$  | $\mathbf{C}$ |
| CT_sumunutau  | $-\frac{4\tilde{G}_F}{\sqrt{2}}V_{us}(\bar{u}_R\sigma^{\mu\nu}s_L)(\bar{\mu}_R\sigma_{\mu\nu}\nu_{\tau L})$ | С            |

# udenu

| WC name      | Operator  | Type            |
|--------------|---|-----------------|
| CVL_duenue   | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_L\gamma^\mu d_L)(\bar{e}_L\gamma_\mu\nu_{eL})$                      | C               |
| CVR_duenue   | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{ud}(ar{u}_R\gamma^\mu d_R)(ar{e}_L\gamma_\mu u_{eL})$                      | $\mathbf{C}$    |
| CSR_duenue   | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_Ld_R)(\bar{e}_R\nu_{eL})$   | $\mathbf{C}$    |
| CSL_duenue   | $-\frac{4\overleftarrow{G_F}}{\sqrt{2}}V_{ud}(\bar{u}_Rd_L)(\bar{e}_R\nu_{eL})$                           | $^{\mathrm{C}}$ |
| CT_duenue    | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_R\sigma^{\mu\nu}d_L)(\bar{e}_R\sigma_{\mu\nu}\nu_{eL})$             | $\mathbf{C}$    |
| CVL_duenumu  | $-rac{4ar{G_F}}{\sqrt{2}}V_{ud}(ar{u}_L\gamma^\mu d_L)(ar{e}_L\gamma_\mu u_{\mu L})$                     | $\mathbf{C}$    |
| CVR_duenumu  | $-rac{4ar{G_F}}{\sqrt{2}}V_{ud}(ar{u}_R\gamma^\mu d_R)(ar{e}_L\gamma_\mu u_{\mu L})$                     | $\mathbf{C}$    |
| CSR_duenumu  | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_Ld_R)(\bar{e}_R\nu_{\mu L})$  | $\mathbf{C}$    |
| CSL_duenumu  | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_Rd_L)(\bar{e}_R u_{\mu L})$   | $\mathbf{C}$    |
| CT_duenumu   | $-rac{4G_F}{\sqrt{2}}V_{ud}(ar{u}_R\sigma^{\mu u}d_L)(ar{e}_R\sigma_{\mu u} u_{\mu L})$                  | $\mathbf{C}$    |
| CVL_duenutau | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{ud}(ar{u}_L\gamma^\mu d_L)(ar{e}_L\gamma_\mu u_{	au L})$                   | $\mathbf{C}$    |
| CVR_duenutau | $-rac{4ar{G}_F}{\sqrt{2}}V_{ud}(ar{u}_R\gamma^\mu d_R)(ar{e}_L\gamma_\mu u_{	au L})$                     | $\mathbf{C}$    |
| CSR_duenutau | $-rac{4ar{Q}_F^2}{\sqrt{2}}V_{ud}(ar{u}_Ld_R)(ar{e}_R u_{	au L})$  | $\mathbf{C}$    |
| CSL_duenutau | $-rac{4\overset{\circ}{G_{F}}}{\sqrt{2}}V_{ud}(\bar{u}_{R}d_{L})(\bar{e}_{R} u_{	au L})$                 | $\mathbf{C}$    |
| CT_duenutau  | $-\frac{4\tilde{G}_F}{\sqrt{2}}V_{ud}(\bar{u}_R\sigma^{\mu\nu}d_L)(\bar{e}_R\sigma_{\mu\nu}\nu_{\tau L})$ | C               |

# ${\tt udmunu}$

| WC name       | Operator  | Type         |
|---------------|---|--------------|
| CVL_dumunue   | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_L\gamma^\mu d_L)(\bar{\mu}_L\gamma_\mu\nu_{eL})$                      | С            |
| CVR_dumunue   | $-rac{4ar{G}_F}{\sqrt{2}}V_{ud}(ar{u}_R\gamma^\mu d_R)(ar{\mu}_L\gamma_\mu u_{eL})$                        | $\mathbf{C}$ |
| CSR_dumunue   | $-\frac{4\bar{G_F}}{\sqrt{2}}V_{ud}(\bar{u}_Ld_R)(\bar{\mu}_R\nu_{eL})$                                     | $\mathbf{C}$ |
| CSL_dumunue   | $-rac{4ar{G_F}}{\sqrt{2}}V_{ud}(ar{u}_Rd_L)(ar{\mu}_R u_{eL})$   | $\mathbf{C}$ |
| CT_dumunue    | $-rac{4ar{G_F}}{\sqrt{2}}V_{ud}(ar{u}_R\sigma^{\mu u}d_L)(ar{\mu}_R\sigma_{\mu u} u_{eL})$                 | $\mathbf{C}$ |
| CVL_dumunumu  | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_L\gamma^\mu d_L)(\bar{\mu}_L\gamma_\mu  u_{\mu L})$                   | $\mathbf{C}$ |
| CVR_dumunumu  | $-rac{4\widetilde{G_F}}{\sqrt{2}}V_{ud}(ar{u}_R\gamma^\mu d_R)(ar{\mu}_L\gamma_\mu u_{\mu L})$             | $\mathbf{C}$ |
| CSR_dumunumu  | $-rac{4G_F}{\sqrt{2}}V_{ud}(ar{u}_Ld_R)(ar{\mu}_R u_{\mu L})$  | $\mathbf{C}$ |
| CSL_dumunumu  | $-rac{4ar{G_F}}{\sqrt{2}}V_{ud}(ar{u}_Rd_L)(ar{\mu}_R u_{\mu L})$  | $\mathbf{C}$ |
| CT_dumunumu   | $-rac{4ar{G_F}}{\sqrt{2}}V_{ud}(ar{u}_R\sigma^{\mu u}d_L)(ar{\mu}_R\sigma_{\mu u} u_{\mu L})$              | $\mathbf{C}$ |
| CVL_dumunutau | $-rac{4	ilde{G_F}}{\sqrt{2}}V_{ud}(ar{u}_L\gamma^\mu d_L)(ar{\mu}_L\gamma_\mu u_{	au L})$                  | $\mathbf{C}$ |
| CVR_dumunutau | $-rac{4\check{G}_F}{\sqrt{2}}V_{ud}(\bar{u}_R\gamma^\mu d_R)(\bar{\mu}_L\gamma_\mu u_{	au L})$             | $\mathbf{C}$ |
| CSR_dumunutau | $-\frac{4G_F}{\sqrt{2}}V_{ud}(\bar{u}_Ld_R)(\bar{\mu}_R u_{\tau L})$  | $\mathbf{C}$ |
| CSL_dumunutau | $-rac{4G_F}{\sqrt{2}}V_{ud}(ar{u}_Rd_L)(ar{\mu}_R u_{	au L})$  | $\mathbf{C}$ |
| CT_dumunutau  | $-\frac{4\tilde{G}_F}{\sqrt{2}}V_{ud}(\bar{u}_R\sigma^{\mu\nu}d_L)(\bar{\mu}_R\sigma_{\mu\nu}\nu_{\tau L})$ | С            |

dF=0

| WC name     | Operator   | Type            |
|-------------|--|-----------------|
| CG          | $\frac{4G_F}{\sqrt{2}}f^{ABC}G^{A u}_{\mu}G^{B ho}_{ u}G^{C\mu}_{ ho}$                               | R               |
| CGtilde     | $rac{4\widetilde{G_F}}{\sqrt{2}}f^{ABC}\widetilde{G}_{\mu}^{A u}G_{ u}^{B ho}G_{ ho}^{C\mu}$        | R               |
| C7_uu       | $rac{4\overset{V}{G_F}}{\sqrt{2}}rac{e}{16\pi^2}m_uar{u}_L\sigma^{\mu u}u_RF_{\mu u}$              | $\mathbf{C}$    |
| C7_dd       | $\frac{4G_F}{\sqrt{2}} \frac{e}{16\pi^2} m_d \bar{d}_L \sigma^{\mu\nu} d_R F_{\mu\nu}$               | $\mathbf{C}$    |
| C7_ss       | $\frac{4G_F}{\sqrt{2}}\frac{e}{16\pi^2}m_s\bar{s}_L\sigma^{\mu\nu}s_RF_{\mu\nu}$                     | $\mathbf{C}$    |
| C8_uu       | $\frac{4G_F}{\sqrt{2}}\frac{g_s}{16\pi^2}m_u\bar{u}_L\sigma^{\mu\nu}T^Au_RG^A_{\mu\nu}$              | $\mathbf{C}$    |
| C8_dd       | $rac{4 	ilde{G_F}}{\sqrt{2}} rac{g_s}{16 \pi^2} m_d ar{d}_L \sigma^{\mu  u} T^A d_R  G^A_{\mu  u}$ | $\mathbf{C}$    |
| C8_ss       | $\frac{4G_F}{\sqrt{2}} \frac{g_s}{16\pi^2} m_s \bar{s}_L \sigma^{\mu\nu} T^A s_R G^A_{\mu\nu}$       | $^{\mathrm{C}}$ |
| CTRR_eeuu   | $\frac{4G_F}{\sqrt{2}}(\bar{e}_L\sigma^{\mu\nu}e_R)(\bar{u}_L\sigma_{\mu\nu}u_R)$                    | $^{\mathrm{C}}$ |
| CTRR_mumuuu | $\frac{4G_F}{\sqrt{2}}(\bar{\mu}_L\sigma^{\mu\nu}\mu_R)(\bar{u}_L\sigma_{\mu\nu}u_R)$                | $\mathbf{C}$    |
| CTRR_eedd   | $\frac{4G_F}{\sqrt{2}}(\bar{e}_L\sigma^{\mu\nu}e_R)(\bar{d}_L\sigma_{\mu\nu}d_R)$                    | $\mathbf{C}$    |
| CTRR_eess   | $\frac{4G_F}{\sqrt{2}}(\bar{e}_L\sigma^{\mu\nu}e_R)(\bar{s}_L\sigma_{\mu\nu}s_R)$                    | $\mathbf{C}$    |
| CTRR_mumudd | $\frac{4G_F}{\sqrt{2}}(\bar{\mu}_L\sigma^{\mu\nu}\mu_R)(\bar{d}_L\sigma_{\mu\nu}d_R)$                | $\mathbf{C}$    |
| CTRR_mumuss | $rac{4 G_F}{\sqrt{2}} (ar{\mu}_L \sigma^{\mu  u} \mu_R) (ar{s}_L \sigma_{\mu  u} s_R)$              | $^{\mathrm{C}}$ |
| CS1RR_uuuu  | $\frac{4G_F}{\sqrt{2}}(\bar{u}_L u_R)(\bar{u}_L u_R)$  | $\mathbf{C}$    |
| CS8RR_uuuu  | $\frac{4G_F}{\sqrt{2}}(\bar{u}_L T^A u_R)(\bar{u}_L T^A u_R)$  | $\mathbf{C}$    |
| CS1RR_uudd  | $\frac{4G_F}{\sqrt{2}}(\bar{u}_L u_R)(\bar{d}_L d_R)$  | $\mathbf{C}$    |
| CS1RR_uuss  | $\frac{4G_F}{\sqrt{2}}(\bar{u}_L u_R)(\bar{s}_L s_R)$  | $\mathbf{C}$    |
| CS8RR_uudd  | $\frac{4G_F}{\sqrt{2}}(\bar{u}_L T^A u_R)(\bar{d}_L T^A d_R)$  | $\mathbf{C}$    |
| CS8RR_uuss  | $\frac{4G_F}{\sqrt{2}}(\bar{u}_L T^A u_R)(\bar{s}_L T^A s_R)$  | $\mathbf{C}$    |
| CS1RR_dddd  | $\frac{4G_F}{\sqrt{2}}(\bar{d}_L d_R)(\bar{d}_L d_R)$  | $\mathbf{C}$    |
| CS1RR_ddss  | $\frac{4G_F}{\sqrt{2}}(\bar{d}_Ld_R)(\bar{s}_Ls_R)$  | $^{\mathrm{C}}$ |
| CS1RR_dssd  | $rac{4G_F}{\sqrt{2}}(ar{d}_L s_R)(ar{s}_L d_R)$   | $\mathbf{C}$    |
| CS1RR_ssss  | $\frac{4G_F}{\sqrt{2}}(\bar{s}_L s_R)(\bar{s}_L s_R)$  | $\mathbf{C}$    |
| CS8RR_dddd  | $\frac{4G_F}{\sqrt{2}}(\bar{d}_L T^A d_R)(\bar{d}_L T^A d_R)$  | $^{\mathrm{C}}$ |
| CS8RR_ddss  | $\frac{4G_F}{\sqrt{2}}(\bar{d}_L T^A d_R)(\bar{s}_L T^A s_R)$  | $\mathbf{C}$    |
| CS8RR_dssd  | $\frac{4G_F}{\sqrt{2}}(\bar{d}_L T^A s_R)(\bar{s}_L T^A d_R)$  | $\mathbf{C}$    |
| CS8RR_ssss  | $\frac{4\tilde{G}_F}{\sqrt{2}}(\bar{s}_L T^A s_R)(\bar{s}_L T^A s_R)$                                | $^{\mathrm{C}}$ |
| CS1RR_uddu  | $rac{4reve{G_F}}{\sqrt{2}}(ar{u}_L d_R)(ar{d}_L u_R)$   | $\mathbf{C}$    |
| CS1RR_ussu  | $rac{4reve{G_F}}{\sqrt{2}}(ar{u}_L s_R)(ar{s}_L u_R)$   | $\mathbf{C}$    |
| CS8RR_uddu  | $rac{4reve{Q}_{F}^{F}}{\sqrt{2}}(ar{u}_{L}T^{A}d_{R})(ar{d}_{L}T^{A}u_{R})$                         | $\mathbf{C}$    |
| CS8RR_ussu  | $rac{4reve{G_F}}{\sqrt{2}}(ar{u}_L T^A s_R)(ar{s}_L T^A u_R)$                                       | $\mathbf{C}$    |

mue

| WC name      | Operator  | Type            |
|--------------|---|-----------------|
| Cgamma_mue   | $ar{e}_L \sigma^{\mu u} \mu_R  F_{\mu u}$   | C               |
| Cgamma_emu   | $ar{\mu}_L \sigma^{\mu u} e_R  \dot{F}_{\mu u}$                                   | C               |
| CVLL_eemue   | $(ar{e}_L \gamma^\mu e_L) (ar{e}_L \gamma_\mu \mu_L)$                             | $^{\mathrm{C}}$ |
| CVLL_muemumu | $(\bar{e}_L \gamma^\mu \mu_L)(\bar{\mu}_L \gamma_\mu \mu_L)$                      | $^{\mathrm{C}}$ |
| CVLL_mueuu   | $(ar{e}_L \gamma^\mu \mu_L) (ar{u}_L \gamma_\mu u_L)$                             | $^{\mathrm{C}}$ |
| CVLL_muedd   | $(ar{e}_L \gamma^\mu \mu_L) (ar{d}_L \gamma_\mu d_L)$                             | $^{\mathrm{C}}$ |
| CVLL_muess   | $(ar{e}_L \gamma^\mu \mu_L) (ar{s}_L \gamma_\mu s_L)$                             | $^{\mathrm{C}}$ |
| CVRR_eemue   | $(ar{e}_R\gamma^\mu e_R)(ar{e}_R\gamma_\mu\mu_R)$                                 | $^{\mathrm{C}}$ |
| CVRR_muemumu | $(\bar{e}_R \gamma^\mu \mu_R)(\bar{\mu}_R \gamma_\mu \mu_R)$                      | C               |
| CVRR_mueuu   | $(\bar{e}_R \gamma^\mu \mu_R)(\bar{u}_R \gamma_\mu u_R)$                          | C               |
| CVRR_muedd   | $(ar{e}_R \gamma^\mu \mu_R) (ar{d}_R \gamma_\mu d_R)$                             | $^{\mathrm{C}}$ |
| CVRR_muess   | $(ar{e}_R \gamma^\mu \mu_R) (ar{s}_R \gamma_\mu s_R)$                             | $^{\mathrm{C}}$ |
| CVLR_eemue   | $(ar{e}_L \gamma^\mu e_L)(ar{e}_R \gamma_\mu \mu_R)$                              | $^{\mathrm{C}}$ |
| CVLR_mueee   | $(ar{e}_L\gamma^\mu\mu_L)(ar{e}_R\gamma_\mu e_R)$                                 | $^{\mathrm{C}}$ |
| CVLR_muemumu | $(\bar{e}_L \gamma^\mu \mu_L)(\bar{\mu}_R \gamma_\mu \mu_R)$                      | $^{\mathrm{C}}$ |
| CVLR_mumumue | $(ar{\mu}_L \gamma^\mu \mu_L) (ar{e}_R \gamma_\mu \mu_R)$                         | $^{\mathrm{C}}$ |
| CVLR_mueuu   | $(\bar{e}_L \gamma^\mu \mu_L)(\bar{u}_R \gamma_\mu u_R)$                          | $^{\mathrm{C}}$ |
| CVLR_muedd   | $(ar{e}_L \gamma^\mu \mu_L) (ar{d}_R \gamma_\mu d_R)$                             | $^{\mathrm{C}}$ |
| CVLR_muess   | $(ar{e}_L \gamma^\mu \mu_L) (ar{s}_R \gamma_\mu s_R)$                             | $\mathbf{C}$    |
| CVLR_uumue   | $(ar{u}_L \gamma^\mu u_L) (ar{e}_R \gamma_\mu \mu_R)$                             | $\mathbf{C}$    |
| CVLR_ddmue   | $(ar{d}_L \gamma^\mu d_L) (ar{e}_R \gamma_\mu \mu_R)$                             | $\mathbf{C}$    |
| CVLR_ssmue   | $(ar{s}_L \gamma^\mu s_L) (ar{e}_R \gamma_\mu \mu_R)$                             | $\mathbf{C}$    |
| CSRL_mueuu   | $(ar{e}_L\mu_R)(ar{u}_Ru_L)$  | $^{\mathrm{C}}$ |
| CSRL_emuuu   | $(ar{\mu}_L e_R)(ar{u}_R u_L)$  | C               |
| CSRL_muedd   | $(ar{e}_L\mu_R)(ar{d}_Rd_L)$  | $^{\mathrm{C}}$ |
| CSRL_muess   | $(ar{e}_L\mu_R)(ar{s}_Rs_L)$  | C               |
| CSRL_emudd   | $(ar{\mu}_L e_R)(ar{d}_R d_L)$  | $^{\mathrm{C}}$ |
| CSRL_emuss   | $(ar{\mu}_L e_R)(ar{s}_R s_L)$  | $\mathbf{C}$    |
| CSRR_eemue   | $(ar{e}_L e_R)(ar{e}_L \mu_R)$  | $\mathbf{C}$    |
| CSRR_eeemu   | $(ar{e}_L e_R)(ar{\mu}_L e_R)$  | $\mathbf{C}$    |
| CSRR_muemumu | $(ar{e}_L\mu_R)(ar{\mu}_L\mu_R)$  | $\mathbf{C}$    |
| CSRR_emumumu | $(ar{\mu}_L e_R)(ar{\mu}_L \mu_R)$  | $\mathbf{C}$    |
| CSRR_mueuu   | $(ar{e}_L\mu_R)(ar{u}_Lu_R)$  | $\mathbf{C}$    |
| CSRR_emuuu   | $(ar{\mu}_L e_R)(ar{u}_L u_R)$  | $\mathbf{C}$    |
| CTRR_mueuu   | $(\bar{e}_L \sigma^{\mu\nu} \mu_R)(\bar{u}_L \sigma_{\mu\nu} u_R)$                | $\mathbf{C}$    |
| CTRR_emuuu   | $(\bar{\mu}_L \sigma^{\mu  u} e_{\underline{R}}) (\bar{u}_L \sigma_{\mu  u} u_R)$ | $^{\mathrm{C}}$ |
| CSRR_muedd   | $(ar{e}_L\mu_R)(d_Ld_R)$  | $\mathbf{C}$    |
| CSRR_muess   | $(ar{e}_L\mu_R)(ar{s}_Ls_R)$  | $^{\mathrm{C}}$ |
| CSRR_emudd   | $(ar{\mu}_L e_R)(ar{d}_L d_R)$  | $\mathbf{C}$    |
| CSRR_emuss   | $(ar{\mu}_L e_R)(ar{s}_L s_{ar{R}})$  | $^{\mathrm{C}}$ |
| CTRR_muedd   | $(ar{e}_L\sigma^{\mu u}\mu_R)(ar{d}_L\sigma_{\mu u}d_R)$                          | $\mathbf{C}$    |
| CTRR_muess   | $(\bar{e}_L \sigma^{\mu\nu} \mu_R) (\bar{s}_L \sigma_{\mu\nu} s_R)$               | $^{\mathrm{C}}$ |
| CTRR_emudd   | $(\bar{\mu}_L \sigma^{\mu\nu} e_R)(\bar{d}_L \sigma_{\mu\nu} d_R)$                | С               |
|              |   |                 |

| WC name    | Operator  | Type |
|------------|---|------|
| CTRR_emuss | $(ar{\mu}_L \sigma^{\mu u} e_R) (ar{s}_L \sigma_{\mu u} s_R)$ | С    |

# nunumue

| WC name                   | Operator  | Type         |
|---------------------------|---|--------------|
| CVLL_nuenuemue            | $(\bar{ u}_{eL}\gamma^{\mu} u_{eL})(\bar{e}_{L}\gamma_{\mu}\mu_{L})$                                  | $^{\rm C}$   |
| CVLL_numunueemu           | $(ar{ u}_{eL}\gamma^{\mu} u_{\mu L})(ar{\mu}_{L}\gamma_{\mu}e_{L})$                                   | $\mathbf{C}$ |
| CVLL_numunuemue           | $(\bar{ u}_{eL}\gamma^{\mu} u_{\mu L})(\bar{e}_{L}\gamma_{\mu}\mu_{L})$                               | $\mathbf{C}$ |
| CVLL_numunumumue          | $(ar{ u}_{\mu L} \gamma^{\mu}  u_{\mu L}) (ar{e}_L \gamma_{\mu} \mu_L)$                               | $\mathbf{C}$ |
| CVLL_nutaunueemu          | $(ar{ u}_{eL}\gamma^{\mu} u_{	au L})(ar{\mu}_{L}\gamma_{\mu}e_{L})$                                   | $\mathbf{C}$ |
| CVLL_nutaunuemue          | $(ar{ u}_{eL}\gamma^{\mu} u_{	au L})(ar{e}_{L}\gamma_{\mu}\mu_{L})$                                   | $\mathbf{C}$ |
| CVLL_nutaunumuemu         | $a \left( ar{ u}_{\mu L} \gamma^{\mu}  u_{	au L}  ight) \left( ar{\mu}_{L} \gamma_{\mu} e_{L}  ight)$ | $\mathbf{C}$ |
| CVLL_nutaunumumue         | $e\left(ar{ u}_{\mu L}\gamma^{\mu} u_{	au L} ight)(ar{e}_{L}\gamma_{\mu}\mu_{L})$                     | $\mathbf{C}$ |
| CVLL_nutaunutaumu         | ${\bf n} ullet (ar{ u}_{	au L} \gamma^{\mu}  u_{	au L}) (ar{e}_L \gamma_{\mu} \mu_L)$                 | $\mathbf{C}$ |
| CVLR_nuenuemue            | $(ar{ u}_{eL}\gamma^{\mu} u_{eL})(ar{e}_{R}\gamma_{\mu}\mu_{R})$                                      | $\mathbf{C}$ |
| CVLR_numunueemu           | $(ar{ u}_{eL}\gamma^{\mu} u_{\mu L})(ar{\mu}_{R}\gamma_{\mu}e_{R})$                                   | С            |
| CVLR_numunuemue           | $(\bar{ u}_{eL}\gamma^{\mu} u_{\mu L})(\bar{e}_R\gamma_{\mu}\mu_R)$                                   | $\mathbf{C}$ |
| CVLR_numunumumue          | $(ar{ u}_{\mu L} \gamma^{\mu}  u_{\mu L}) (ar{e}_R \gamma_{\mu} \mu_R)$                               | $\mathbf{C}$ |
| ${\tt CVLR\_nutaunueemu}$ | $(ar{ u}_{eL}\gamma^{\mu} u_{	au L})(ar{\mu}_{R}\gamma_{\mu}e_{R})$                                   | С            |
| CVLR_nutaunuemue          | $(ar{ u}_{eL}\gamma^{\mu} u_{	au L})(ar{e}_{R}\gamma_{\mu}\mu_{R})$                                   | С            |
| CVLR_nutaunumuemu         | $a\left(ar{ u}_{\mu L}\gamma^{\mu} u_{	au L} ight)(ar{\mu}_{R}\gamma_{\mu}e_{R})$                     | $\mathbf{C}$ |
| CVLR_nutaunumumue         | $e\left(ar{ u}_{\mu L}\gamma^{\mu} u_{	au L} ight)(ar{e}_{R}\gamma_{\mu}\mu_{R})$                     | $\mathbf{C}$ |
| CVLR_nutaunutaumu         | $\mathrm{d}(\bar{\nu}_{\tau L}\gamma^{\mu}\nu_{\tau L})(\bar{e}_R\gamma_{\mu}\mu_R)$                  | С            |