

## Basis EOS (EFT WET)

Basis used by the EOS package. Neutrinos are in the flavour basis.

### Sectors

The effective Lagrangian is defined as

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

sb

WC name	Operator	Type
b->s::c1	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* (\bar{s}_L \gamma^\mu T^a c_L) (\bar{c}_L \gamma_\mu T^a b_L)$	R
b->s::c2	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* (\bar{s}_L \gamma^\mu c_L) (\bar{c}_L \gamma_\mu b_L)$	R
b->s::c3	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* (\bar{s}_L \gamma^\mu b_L) \sum_q (\bar{q} \gamma_\mu q)$	R
b->s::c4	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* (\bar{s}_L \gamma^\mu T^a b_L) \sum_q (\bar{q} \gamma_\mu T^a q)$	R
b->s::c5	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* (\bar{s}_L \gamma^{\mu_1} \gamma^{\mu_2} \gamma^{\mu_3} b_L) \sum_q (\bar{q} \gamma_{\mu_1} \gamma_{\mu_2} \gamma_{\mu_3} q)$	R
b->s::c6	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* (\bar{s}_L \gamma^{\mu_1} \gamma^{\mu_2} \gamma^{\mu_3} T^a b_L) \sum_q (\bar{q} \gamma_{\mu_1} \gamma_{\mu_2} \gamma_{\mu_3} T^a q)$	R
b->s::Re{c7}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e}{16\pi^2} m_b (\bar{s}_L \sigma_{\mu\nu} b_R) F^{\mu\nu}$	R
b->s::Im{c7}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e}{16\pi^2} m_b (\bar{s}_L \sigma_{\mu\nu} b_R) F^{\mu\nu}$	R
b->s::Re{c7'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e}{16\pi^2} m_b (\bar{s}_R \sigma_{\mu\nu} b_L) F^{\mu\nu}$	R
b->s::Im{c7'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e}{16\pi^2} m_b (\bar{s}_R \sigma_{\mu\nu} b_L) F^{\mu\nu}$	R
b->s::c8	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{g_s}{16\pi^2} m_b (\bar{s}_L \sigma_{\mu\nu} T^a b_R) G^{a\mu\nu}$	R
b->s::c8'	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{g_s}{16\pi^2} m_b (\bar{s}_R \sigma_{\mu\nu} T^a b_L) G^{a\mu\nu}$	R
b->see::Re{c9}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{e} \gamma_\mu e)$	R
b->see::Im{c9}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{e} \gamma_\mu e)$	R
b->see::Re{c9'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{e} \gamma_\mu e)$	R
b->see::Im{c9'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{e} \gamma_\mu e)$	R
b->see::Re{c10}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{e} \gamma_\mu \gamma_5 e)$	R
b->see::Im{c10}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{e} \gamma_\mu \gamma_5 e)$	R
b->see::Re{c10'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{e} \gamma_\mu \gamma_5 e)$	R
b->see::Im{c10'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{e} \gamma_\mu \gamma_5 e)$	R
b->see::Re{cS}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{e} e)$	R
b->see::Im{cS}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{e} e)$	R
b->see::Re{cS'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{e} e)$	R
b->see::Im{cS'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{e} e)$	R
b->see::Re{cP}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{e} \gamma_5 e)$	R

WC name	Operator	Type
b->see::Im{cP}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{e} \gamma_5 e)$	R
b->see::Re{cP'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{e} \gamma_5 e)$	R
b->see::Im{cP'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{e} \gamma_5 e)$	R
b->see::Re{cT}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{e} \sigma_{\mu\nu} e)$	R
b->see::Im{cT}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{e} \sigma_{\mu\nu} e)$	R
b->see::Re{cT5}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{e} \sigma_{\mu\nu} \gamma_5 e)$	R
b->see::Im{cT5}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{e} \sigma_{\mu\nu} \gamma_5 e)$	R
b->smumu::Re{c9}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{\mu} \gamma_\mu \mu)$	R
b->smumu::Im{c9}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{\mu} \gamma_\mu \mu)$	R
b->smumu::Re{c9'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{\mu} \gamma_\mu \mu)$	R
b->smumu::Im{c9'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{\mu} \gamma_\mu \mu)$	R
b->smumu::Re{c10}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{\mu} \gamma_\mu \gamma_5 \mu)$	R
b->smumu::Im{c10}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^\mu b_L) (\bar{\mu} \gamma_\mu \gamma_5 \mu)$	R
b->smumu::Re{c10'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{\mu} \gamma_\mu \gamma_5 \mu)$	R
b->smumu::Im{c10'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^\mu b_R) (\bar{\mu} \gamma_\mu \gamma_5 \mu)$	R
b->smumu::Re{cS}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{\mu} \mu)$	R
b->smumu::Im{cS}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{\mu} \mu)$	R
b->smumu::Re{cS'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{\mu} \mu)$	R
b->smumu::Im{cS'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{\mu} \mu)$	R
b->smumu::Re{cP}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{\mu} \gamma_5 \mu)$	R
b->smumu::Im{cP}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_L b_R) (\bar{\mu} \gamma_5 \mu)$	R
b->smumu::Re{cP'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{\mu} \gamma_5 \mu)$	R
b->smumu::Im{cP'}	$\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} m_b (\bar{s}_R b_L) (\bar{\mu} \gamma_5 \mu)$	R
b->smumu::Re{cT}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{\mu} \sigma_{\mu\nu} \mu)$	R
b->smumu::Im{cT}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{\mu} \sigma_{\mu\nu} \mu)$	R
b->smumu::Re{cT5}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{\mu} \sigma_{\mu\nu} \gamma_5 \mu)$	R
b->smumu::Im{cT5}	$\frac{4G_F}{\sqrt{2}} V_{ub} \frac{e^2}{16\pi^2} (\bar{s} \sigma_{\mu\nu} b) (\bar{\mu} \sigma_{\mu\nu} \gamma_5 \mu)$	R

#### cbenu

WC name	Operator	Type
b->cenu::Re{cVL}	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
b->cenu::Im{cVL}	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
b->cenu::Re{cVR}	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \gamma^\mu b_R) (\bar{e}_L \gamma_\mu \nu_{eL})$	R

WC name	Operator	Type
$b \rightarrow c_{\text{enu}} : : \text{Im}\{\text{cVR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \gamma^\mu b_R) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
$b \rightarrow c_{\text{enu}} : : \text{Re}\{\text{cSR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L b_R) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow c_{\text{enu}} : : \text{Im}\{\text{cSR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L b_R) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow c_{\text{enu}} : : \text{Re}\{\text{cSL}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R b_L) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow c_{\text{enu}} : : \text{Im}\{\text{cSL}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R b_L) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow c_{\text{enu}} : : \text{Re}\{\text{cT}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \sigma^{\mu\nu} b_L) (\bar{e}_R \sigma_{\mu\nu} \nu_{eL})$	R
$b \rightarrow c_{\text{enu}} : : \text{Im}\{\text{cT}\}$	$-\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \sigma^{\mu\nu} b_L) (\bar{e}_R \sigma_{\mu\nu} \nu_{eL})$	R

### cbmunu

WC name	Operator	Type
$b \rightarrow c_{\text{munu}} : : \text{Re}\{\text{cVL}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Im}\{\text{cVL}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Re}\{\text{cVR}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \gamma^\mu b_R) (\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Im}\{\text{cVR}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \gamma^\mu b_R) (\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Re}\{\text{cSR}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L b_R) (\bar{\mu}_R \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Im}\{\text{cSR}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L b_R) (\bar{\mu}_R \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Re}\{\text{cSL}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R b_L) (\bar{\mu}_R \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Im}\{\text{cSL}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R b_L) (\bar{\mu}_R \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Re}\{\text{cT}\}$	$\frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \sigma^{\mu\nu} b_L) (\bar{\mu}_R \sigma_{\mu\nu} \nu_{\mu L})$	R
$b \rightarrow c_{\text{munu}} : : \text{Im}\{\text{cT}\}$		R

### ubenu

WC name	Operator	Type
$b \rightarrow u_{\text{enu}} : : \text{Re}\{\text{cVL}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Im}\{\text{cVL}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Re}\{\text{cVR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_R \gamma^\mu b_R) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Im}\{\text{cVR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_R \gamma^\mu b_R) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Re}\{\text{cSR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_L b_R) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Im}\{\text{cSR}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_L b_R) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Re}\{\text{cSL}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_R b_L) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Im}\{\text{cSL}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_R b_L) (\bar{e}_R \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Re}\{\text{cT}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_R \sigma^{\mu\nu} b_L) (\bar{e}_R \sigma_{\mu\nu} \nu_{eL})$	R
$b \rightarrow u_{\text{enu}} : : \text{Im}\{\text{cT}\}$	$-\frac{4G_F}{\sqrt{2}} V_{ub} (\bar{u}_R \sigma^{\mu\nu} b_L) (\bar{e}_R \sigma_{\mu\nu} \nu_{eL})$	R

ubmunu

WC name	Operator	Type
b->umunumu : Re{cVL}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_L \gamma^\mu b_L)(\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
b->umunumu : Im{cVL}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_L \gamma^\mu b_L)(\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
b->umunumu : Re{cVR}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_R \gamma^\mu b_R)(\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
b->umunumu : Im{cVR}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_R \gamma^\mu b_R)(\bar{\mu}_L \gamma_\mu \nu_{\mu L})$	R
b->umunumu : Re{cSR}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_L b_R)(\bar{\mu}_R \nu_{\mu L})$	R
b->umunumu : Im{cSR}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_L b_R)(\bar{\mu}_R \nu_{\mu L})$	R
b->umunumu : Re{cSL}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_R b_L)(\bar{\mu}_R \nu_{\mu L})$	R
b->umunumu : Im{cSL}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_R b_L)(\bar{\mu}_R \nu_{\mu L})$	R
b->umunumu : Re{cT}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_R \sigma^{\mu\nu} b_L)(\bar{\mu}_R \sigma_{\mu\nu} \nu_{\mu L})$	R
b->umunumu : Im{cT}	$\frac{4G_F}{\sqrt{2}} V_{ub}(\bar{u}_R \sigma^{\mu\nu} b_L)(\bar{\mu}_R \sigma_{\mu\nu} \nu_{\mu L})$	R