Basis EOS (EFT WET)

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

Sectors

The effective Lagrangian is defined as $\,$

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

sb

WC name	Operator	Type
b->s::c1	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*(\bar{s}_L\gamma^{\mu}T^ac_L)(\bar{c}_L\gamma_{\mu}T^ab_L)$	R
b->s::c2	$\frac{4\widetilde{G}_F^F}{\sqrt{2}}V_{tb}V_{ts}^*(\bar{s}_L\gamma^\mu c_L)(\bar{c}_L\gamma_\mu b_L)$	R
b->s::c3	$\frac{4\overset{\leftarrow}{V_{c}}}{\sqrt{2}}V_{tb}V_{ts}^{*}(\bar{s}_{L}\gamma^{\mu}b_{L})\sum_{q}(\bar{q}\gamma_{\mu}q)$	R
b->s::c4	$\frac{4\tilde{Q}_F^F}{\sqrt{2}}V_{tb}V_{ts}^*(\bar{s}_L\gamma^\mu T^ab_L)\sum_q(\bar{q}\gamma_\mu T^aq)$	R
b->s::c5	$\frac{4\breve{G}_{F}}{\sqrt{2}}V_{tb}V_{ts}^{*}(\bar{s}_{L}\gamma^{\mu_{1}}\gamma^{\mu_{2}}\gamma^{\mu_{3}}b_{L})\sum_{q}(\bar{q}\gamma_{\mu_{1}}\gamma_{\mu_{2}}\gamma_{\mu_{3}}q)$	R
b->s::c6	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*(\bar{s}_L\gamma^{\mu_1}\gamma^{\mu_2}\gamma^{\mu_3}T^ab_L)\sum_{q}(\bar{q}\gamma_{\mu_1}\gamma_{\mu_2}\gamma_{\mu_3}T^aq)$	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	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{g_s}{16\pi^2}m_b(\bar{s}_L\sigma_{\mu\nu}T^ab_R)G^{a\mu\nu}$	R
b->s::c8'	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{g_s}{16\pi^2}m_b(\bar{s}_R\sigma_{\mu\nu}T^ab_L)G^{a\mu\nu}$	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}	$\frac{4\widetilde{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^\mu b_L)(\bar{e}\gamma_\mu e)$	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'}	$\frac{4\dot{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_R\gamma^\mu b_R)(\bar{e}\gamma_\mu e)$	R
b->see::Re{c10}	$\frac{4\dot{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^\mu b_L)(\bar{e}\gamma_\mu\gamma_5 e)$	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}	$\frac{{}^{4}G_{F}}{\sqrt{2}}V_{tb}V_{ts}^{*}\frac{e^{2}}{16\pi^{2}}m_{b}(\bar{s}_{L}b_{R})(\bar{e}e)$	R
b->see::Im{cS}	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_Lb_R)(\bar{e}e)$	R
b->see::Re{cS'}	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_Rb_L)(\bar{e}e)$	R
b->see::Im{cS'}	$\frac{4\dot{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_Rb_L)(\bar{e}e)$	\mathbf{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'}	$\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{tb}V_{ts}^{*}\frac{e^{2}}{16\pi^{2}}m_{b}(\bar{s}_{R}b_{L})(\bar{e}\gamma_{5}e)$	${ m R}$
b->see::Im{cP'}	$\frac{4\tilde{G}_{F}}{\sqrt{2}}V_{tb}V_{ts}^{*}\frac{e^{2}}{16\pi^{2}}m_{b}(\bar{s}_{R}b_{L})(\bar{e}\gamma_{5}e)$	${ m R}$
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}	$\frac{4G_F}{\sqrt{2}}V_{ub}\frac{e^2}{16\pi^2}(\bar{s}\sigma_{\mu\nu}b)(\bar{e}\sigma_{\mu\nu}e)$	\mathbf{R}
b->see::Re{cT5}	$\frac{4G_F}{\sqrt{2}}V_{ub}\frac{e^2}{16\pi^2}(\bar{s}\sigma_{\mu\nu}b)(\bar{e}\sigma_{\mu\nu}\gamma_5e)$	R
b->see::Im{cT5}	$rac{4\overset{\circ}{V_F}}{\sqrt{2}}V_{ub}rac{e^2}{16\pi^2}(ar{s}\sigma_{\mu u}b)(ar{e}\sigma_{\mu u}\gamma_5 e)$	R
b->smumu::Re{c9}	$\frac{4\dot{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}(\bar{s}_L\gamma^{\mu}b_L)(\bar{\mu}\gamma_{\mu}\mu)$	R
	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_L \gamma^{\mu} b_L)(\bar{\mu}\gamma_{\mu}\mu)$	R
b->smumu::Re{c9'}	$+rac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*rac{e^2}{16\pi^2}(ar{s}_R\gamma^{\mu}b_R)(ar{\mu}\gamma_{\mu}\mu)$	R
b->smumu::Im{c9'}	$+rac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*rac{e^2}{16\pi^2}(ar{s}_R\gamma^{\mu}b_R)(ar{\mu}\gamma_{\mu}\mu)$	R
b->smumu::Re{c10}	$+rac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*rac{e^2}{16\pi^2}(ar{s}_L\gamma^{\mu}b_L)(ar{\mu}\gamma_{\mu}\gamma_{5}\mu)$	R
b->smumu::Im{c10}	$+rac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*rac{e^2}{16\pi^2}(ar{s}_L\gamma^{\mu}b_L)(ar{\mu}\gamma_{\mu}\gamma_{5}\mu)$	R
b->smumu::Re{c10'	$\frac{\dot{G}_{F}}{\sqrt{2}}V_{tb}V_{ts}^{*}\frac{e^{2}}{16\pi^{2}}(\bar{s}_{R}\gamma^{\mu}b_{R})(\bar{\mu}\gamma_{\mu}\gamma_{5}\mu)$	R
b->smumu::Im{c10'	$\frac{1}{\sqrt{2}} V_{tb} V_{ts}^* \frac{e^2}{16\pi^2} (\bar{s}_R \gamma^{\mu} b_R) (\bar{\mu} \gamma_{\mu} \gamma_5 \mu)$	R
	$\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_L b_R)(\bar{\mu}\mu)$	R
b->smumu::Im{cS}	$\frac{4\dot{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_L b_R)(\bar{\mu}\mu)$	R
	$+\frac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_Rb_L)(\bar{\mu}\mu)$	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}	$\frac{4\dot{G}_F}{\sqrt{2}}V_{tb}V_{ts}^*\frac{e^2}{16\pi^2}m_b(\bar{s}_L b_R)(\bar{\mu}\gamma_5\mu)$	R
b->smumu::Re{cP'}	$+rac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*rac{e^2}{16\pi^2}m_b(ar{s}_Rb_L)(ar{\mu}\gamma_5\mu)$	R
b->smumu::Im{cP'}	$+rac{4G_F}{\sqrt{2}}V_{tb}V_{ts}^*rac{e^2}{16\pi^2}m_b(\bar{s}_Rb_L)(\bar{\mu}\gamma_5\mu)$	R
b->smumu::Re{cT}	$\frac{4\overset{\sim}{G_F}}{\sqrt{2}}V_{ub}\frac{e^2}{16\pi^2}(\bar{s}\sigma_{\mu\nu}b)(\bar{\mu}\sigma_{\mu\nu}\mu)$	R
b->smumu::Im{cT}	$\frac{4\overset{\circ}{V_F}}{\sqrt{2}}V_{ub}\frac{e^2}{16\pi^2}(\bar{s}\sigma_{\mu\nu}b)(\bar{\mu}\sigma_{\mu\nu}\mu)$	${ m R}$
b->smumu::Re{cT5}	$\frac{{}^{4G_F}_{GF}}{\sqrt{2}}V_{ub}\frac{e^2}{16\pi^2}(\bar{s}\sigma_{\mu\nu}b)(\bar{\mu}\sigma_{\mu\nu}\gamma_5\mu)$	${ m R}$
	$\frac{4\ddot{G}_F}{\sqrt{2}}V_{ub}\frac{e^2}{16\pi^2}(\bar{s}\sigma_{\mu\nu}b)(\bar{\mu}\sigma_{\mu\nu}\gamma_5\mu)$	R

cbenu

WC name	Operator	Type
b->cenue::Re{c	$\text{CVL}\} - \frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL})$	R
b->cenue::Im{c	$\mathrm{CVL}\} - rac{4ar{G}_F}{\sqrt{2}} V_{cb} (ar{c}_L \gamma^\mu b_L) (ar{e}_L \gamma_\mu u_{eL})$	R
b->cenue::Re{c	$\begin{array}{l} \text{EVL}\} - \frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL}) \\ \text{EVL}\} - \frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_L \gamma^\mu b_L) (\bar{e}_L \gamma_\mu \nu_{eL}) \\ \text{EVR}\} - \frac{4G_F}{\sqrt{2}} V_{cb} (\bar{c}_R \gamma^\mu b_R) (\bar{e}_L \gamma_\mu \nu_{eL}) \end{array}$	R

WC name	Operator	Type
b->cenue::Im{cVR	$-\frac{4G_F}{\sqrt{2}}V_{cb}(\bar{c}_R\gamma^{\mu}b_R)(\bar{e}_L\gamma_{\mu}\nu_{eL})$	R
b->cenue::Re{cSR		${ m R}$
b->cenue::Im{cSR	$\left\{-\frac{4G_F}{\sqrt{2}}V_{cb}(\bar{c}_Lb_R)(\bar{e}_R\nu_{eL})\right\}$	R
b->cenue::Re{cSL	$-\frac{4G_F}{\sqrt{2}}V_{cb}(\bar{c}_Rb_L)(\bar{e}_R\nu_{eL})$	R
b->cenue::Im{cSL	$\left\{-\frac{4G_F}{\sqrt{2}}V_{cb}(\bar{c}_Rb_L)(\bar{e}_R\nu_{eL})\right\}$	R
b->cenue::Re{cT}	$-rac{4rac{\zeta_F}{\sqrt{2}}}{\sqrt{2}}V_{cb}(ar{c}_R\sigma^{\mu u}b_L)(ar{e}_R\sigma_{\mu u} u_{eL})$	${ m R}$
b->cenue::Im{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

${\tt cbmunu}$

WC name	Operator	Type
b->cmunumu::Re	$\{ cVL \} rac{4G_F}{\sqrt{2}} V_{cb} (ar{c}_L \gamma^\mu b_L) (ar{\mu}_L \gamma_\mu u_{\mu L})$	R
b->cmunumu::Im	{cVL} $rac{4ar{G_F}}{\sqrt{2}}V_{cb}(ar{c}_L\gamma^\mu b_L)(ar{\mu}_L\gamma_\mu u_{\mu L})$	R
	$\{ extsf{cVR}\}rac{4reve{G_F}}{\sqrt{2}}V_{cb}(ar{c}_R\gamma^\mu b_R)(ar{\mu}_L\gamma_\mu u_{\mu L})$	R
b->cmunumu::Im	{cVR} $rac{4ar{G_F}}{\sqrt{2}}V_{cb}(ar{c}_R\gamma^\mu b_R)(ar{\mu}_L\gamma_\mu u_{\mu L})$	R
b->cmunumu::Re	{cSR} $rac{4ar{G_F}}{\sqrt{2}}V_{cb}(ar{c}_Lb_R)(ar{\mu}_R u_{\mu L})$	R
b->cmunumu::Im	{cSR} $rac{4ar{G_F}}{\sqrt{2}}V_{cb}(ar{c}_Lb_R)(ar{\mu}_R u_{\mu L})$	R
b->cmunumu::Re	{cSL} $rac{4ar{G_F}}{\sqrt{2}}V_{cb}(ar{c}_Rb_L)(ar{\mu}_R u_{\mu L})$	R
b->cmunumu::Im	{cSL} $rac{4ar{G_F}}{\sqrt{2}}V_{cb}(ar{c}_Rb_L)(ar{\mu}_R u_{\mu L})$	R
b->cmunumu::Re	{cSL} $rac{4 ilde{G}_F}{\sqrt{2}}V_{cb}(ar{c}_Rb_L)(ar{\mu}_R u_{\mu L})$ {cT}- $rac{4 ilde{G}_F}{\sqrt{2}}V_{cb}(ar{c}_R\sigma^{\mu u}b_L)(ar{\mu}_R\sigma_{\mu u} u_{\mu L})$	R
b->cmunumu::Im		R

ubenu

WC name	Operator	Type
b->uenue::Re{cVL	$\{-rac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_L\gamma^{\mu}b_L)(\bar{e}_L\gamma_{\mu} u_{eL})\}$	R
b->uenue::Im{cVL	$\left\{-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_L\gamma^{\mu}b_L)(\bar{e}_L\gamma_{\mu}\nu_{eL})\right\}$	\mathbf{R}
b->uenue::Re{cVR	$\left\{-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_R\gamma^{\mu}b_R)(\bar{e}_L\gamma_{\mu}\nu_{eL})\right\}$	\mathbf{R}
b->uenue::Im{cVR	$-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_R\gamma^{\mu}b_R)(\bar{e}_L\gamma_{\mu}\nu_{eL})$	\mathbf{R}
b->uenue::Re{cSR	$-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_L b_R)(\bar{e}_R \nu_{eL})$	\mathbf{R}
b->uenue::Im{cSR	$-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_L b_R)(\bar{e}_R \nu_{eL})$	\mathbf{R}
b->uenue::Re{cSL	$-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_Rb_L)(\bar{e}_R\nu_{eL})$	\mathbf{R}
b->uenue::Im{cSL	$-\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_Rb_L)(\bar{e}_R\nu_{eL})$	\mathbf{R}
b->uenue::Re{cT}	$-rac{4ar{G}_F}{\sqrt{2}}V_{ub}(ar{u}_R\sigma^{\mu u}b_L)(ar{e}_R\sigma_{\mu u} u_{eL})$	\mathbf{R}
b->uenue::Im{cT}	$-rac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_R\sigma^{\mu u}b_L)(\bar{e}_R\sigma_{\mu u} u_{eL})$	R

ubmunu

WC name	Operator	Type
b->umunumu::Re	$\{\text{cVL-}\}\frac{4G_F}{\sqrt{2}}V_{ub}(\bar{u}_L\gamma^{\mu}b_L)(\bar{\mu}_L\gamma_{\mu}\nu_{\mu L})$	R
b->umunumu::Im	$\{ \mathtt{cVL} \} rac{\sqrt{2}}{\sqrt{2}} V_{ub} (ar{u}_L \gamma^\mu b_L) (ar{\mu}_L \gamma_\mu u_\mu L)$	R
b->umunumu::Re	$\{\text{cVR}\}rac{4\overset{\sim}{G_F}}{\sqrt{2}}V_{ub}(ar{u}_R\gamma^\mu b_R)(ar{\mu}_L\gamma_\mu u_{\mu L})$	R
b->umunumu::Im	$\{\text{cVR}\}rac{4\widetilde{G}_F}{\sqrt{2}}V_{ub}(ar{u}_R\gamma^\mu b_R)(ar{\mu}_L\gamma_\mu u_{\mu L})$	R
b->umunumu::Re	$\{\text{cSR}\}\frac{4\widetilde{G}_F}{\sqrt{2}}V_{ub}(\bar{u}_Lb_R)(\bar{\mu}_R u_{\mu L})$	R
b->umunumu::Im	$\{cSR\}\frac{4\widetilde{G}_F}{\sqrt{2}}V_{ub}(ar{u}_Lb_R)(ar{\mu}_R u_{\mu L})$	R
b->umunumu::Re	$\{\text{cSL}\}\frac{4\widetilde{G}_F}{\sqrt{2}}V_{ub}(\bar{u}_Rb_L)(\bar{\mu}_R u_{\mu L})$	R
b->umunumu::Im	$\{cSL\} rac{4 \widetilde{G}_F}{\sqrt{2}} V_{ub}(ar{u}_R b_L)(ar{\mu}_R u_{\mu L})$	R
b->umunumu::Re	$\{cT\}$ - $\frac{4G_F^2}{\sqrt{2}}V_{ub}(\bar{u}_R\sigma^{\mu\nu}b_L)(\bar{\mu}_R\sigma_{\mu\nu}\nu_{\mu L})$	R
b->umunumu::Im	-{cT}- $rac{4 \overset{\sim}{G_F}}{\sqrt{2}} V_{ub} (ar{u}_R \sigma^{\mu u} b_L) (ar{\mu}_R \sigma_{\mu u} u_{\mu L})$	\mathbf{R}