

Leptoquark	Spin	F	$SU(3)_C \otimes SU(2)_L \otimes U(1)_Y$ representation	Q_{EM}	Coupling		Decay mode
S_1	0	2	$(\mathbf{3}, \mathbf{1}, -2/3)$	$-1/3$	$\lambda_{L,R}(u, e_{L,R}),$	$-\lambda_L(d, \nu_e)$	$t\tau^-, b\nu$
\tilde{S}_1	0	2	$(\mathbf{3}, \mathbf{1}, -8/3)$	$-4/3$	$\lambda_R(d, e_R)$		$b\tau^-$
S_2	0	0	$(\bar{\mathbf{3}}, \mathbf{2}, -7/3)$	$-2/3$ $-5/3$	$\lambda_L(u, \nu_e),$ $\lambda_{L,R}(u, e_{L,R})$	$\lambda_R(d, e_R)$	$\bar{t}\nu, b\tau^+$ $\bar{t}\tau^-$
\tilde{S}_2	0	0	$(\bar{\mathbf{3}}, \mathbf{2}, -1/3)$	$+1/3$ $-2/3$	$\lambda_L(d, \nu_e)$ $\lambda_L(d, e_L)$		$\bar{b}\nu$ $\bar{b}\tau^-$
S_3	0	2	$(\mathbf{3}, \mathbf{3}, -2/3)$	$+2/3$ $-1/3$ $-4/3$	$\sqrt{2}\lambda_L(u, \nu_e)$ $-\lambda_L(u, e_L),$ $-\sqrt{2}\lambda_L(d, e_L)$	$-\lambda_L(d, \nu_e)$	$t\nu$ $t\tau^-, b\nu$ $b\tau^-$
V_1	1	0	$(\bar{\mathbf{3}}, \mathbf{1}, -4/3)$	$-2/3$	$\lambda_{L,R}(d, e_{L,R}),$	$\lambda_L(u, \nu_e)$	$\bar{b}\tau^-, \bar{t}\nu$
\tilde{V}_1	1	0	$(\bar{\mathbf{3}}, \mathbf{1}, -10/3)$	$-5/3$	$\lambda_R(u, e_R)$		$\bar{t}\tau^-$
V_2	1	2	$(\mathbf{3}, \mathbf{2}, -5/3)$	$-1/3$ $-4/3$	$\lambda_L(d, \nu_e),$ $\lambda_{L,R}(d, e_{L,R})$	$\lambda_R(u, e_R)$	$b\nu, t\tau^-$ $b\tau^-$
\tilde{V}_2	1	2	$(\mathbf{3}, \mathbf{2}, +1/3)$	$+2/3$ $-1/3$	$\lambda_L(u, \nu_e)$ $\lambda_L(u, e_L)$		$t\nu$ $t\tau^-$
V_3	1	0	$(\bar{\mathbf{3}}, \mathbf{3}, -4/3)$	$+1/3$ $-2/3$ $-5/3$	$\sqrt{2}\lambda_L(d, \nu_e)$ $-\lambda_L(d, e_L),$ $\sqrt{2}\lambda_L(u, e_L)$	$\lambda_L(u, \nu_e)$	$\bar{b}\nu$ $\bar{b}\tau^-, \bar{t}\nu$ $\bar{t}\tau^-$

Table 2.1: Scalar and vector LQs as defined in the mBRW model. Representations under the SM gauge group are labelled by the dimensions of $SU(3)_C$ and $SU(2)_L$ representations, and the $U(1)_Y$ hypercharge Y, respectively. Fermion number is defined as $F = 3B + L$, and electric charge, $Q_{EM} = T^3 + Y/2$, is in units of proton charge, $|e|$, where T^3 is the third eigenvalue component of the $SU(2)$ representation. Decay mode is provided assuming third generation LQs only.