$$-\frac{1}{3}\hbar\frac{1}{\epsilon}B^{\mu\nu 2}-\frac{1}{4}\frac{1}{g_Y^2}B^{\mu\nu 2}-\frac{1}{4}\frac{1}{g_s^2}G^{\mu\nu A2}-\frac{1}{4}\frac{1}{g_L^2}W^{\mu\nu I2}-\frac{1}{3}\hbar B^{\mu\nu 2}\,\mathrm{Log}\left[\frac{\overline{\mu}^2}{M_\phi^2}\right]+$$

$$D_\mu\overline{H}_i D_\mu H^i+C_{H^2}\overline{H}_i H^i+i\left(\overline{d}^r_a\cdot\gamma_\mu P_R\cdot D_\mu d^{ar}\right)+i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot D_\mu e^r\right)+$$

$$i\left(\overline{l}^r_i\cdot\gamma_\mu P_L\cdot D_\mu l^{ir}\right)+i\left(\overline{q}^r_{ai}\cdot\gamma_\mu P_L\cdot D_\mu q^{air}\right)+i\left(\overline{u}^r_a\cdot\gamma_\mu P_R\cdot D_\mu u^{ar}\right)-$$

$$\frac{1}{2}\lambda\overline{H}_i\overline{H}_j H^i H^j+\hbar\frac{1}{\epsilon}\left(\lambda_{H\chi}^{pr}\right)^2\overline{H}_i\overline{H}_j H^i H^j+\hbar\left(\lambda_{H\chi}^{pr}\right)^2 LF_{1,1,0}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i\overline{H}_j H^i H^j-$$

$$\overline{Y_d}^{pr}\overline{H}_i\left(\overline{d}^r_a\cdot P_L\cdot q^{aip}\right)-\overline{Y_e}^{pr}\overline{H}_i\left(\overline{e}^r\cdot P_L\cdot l^{ip}\right)-\frac{1}{8}\hbar\overline{Y_e}^{ps}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{rt}\overline{H}_i\left(\overline{e}^r\cdot P_L\cdot l^{ip}\right)+$$

$$\frac{1}{4}\hbar\frac{1}{\epsilon}\overline{Y_e}^{ps}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{rt}\overline{H}_i\left(\overline{e}^r\cdot P_L\cdot l^{ip}\right)+\frac{1}{2}\hbar\overline{Y_e}^{ps}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{rt}LF_{1,1,0}\left[M_\phi,M_\chi^t\right]\overline{H}_i\left(\overline{e}^r\cdot P_L\cdot l^{ip}\right)-$$

$$\frac{1}{4}\hbar\overline{Y_e}^{ps}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{rt}LF_{2,1,-1}\left[M_\phi,M_\chi^t\right]\overline{H}_i\left(\overline{e}^r\cdot P_L\cdot l^{ip}\right)-Y_e^{rp}H^i\left(\overline{l}^r_i\cdot P_R\cdot e^p\right)-$$

$$\frac{1}{8}\hbar Y_e^{rt}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{ts}H^i\left(\overline{l}^r_i\cdot P_R\cdot e^p\right)+\frac{1}{4}\hbar\frac{1}{\epsilon}Y_e^{rt}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{ts}H^i\left(\overline{l}^r_i\cdot P_R\cdot e^p\right)+$$

$$\frac{1}{2}\hbar Y_e^{rt}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{ts}LF_{1,1,0}\left[M_\phi,M_\chi^s\right]H^i\left(\overline{l}^r_i\cdot P_R\cdot e^p\right)-$$

$$\frac{1}{4}\hbar Y_e^{rt}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{ts}LF_{2,1,-1}\left[M_\phi,M_\chi^s\right]H^i\left(\overline{l}^r_i\cdot P_R\cdot e^p\right)-Y_d^{rp}H^i\left(\overline{q}^r_{ai}\cdot P_R\cdot d^{ap}\right)-$$

$$Y_u^{rp}\overline{H}_i\left(\overline{q}^r_{aj}\cdot P_R\cdot u^{ap}\right)\varepsilon^{ji}-\overline{Y_u}^{pr}H^j\left(\overline{u}^r_a\cdot P_L\cdot q^{aip}\right)\overline{\varepsilon}_{ij}-\frac{1}{15}\hbar C_{H^2}g_Y^4\frac{1}{M_\phi^2}\overline{H}_i\overline{H}_j H^i H^j+$$

$$\frac{1}{15}\hbar\lambda g_Y^4\frac{1}{M_\phi^2}\overline{H}_i\overline{H}_j\overline{H}_k H^i H^j H^k+2\hbar C_{H^2}\left(\lambda_{H\chi}^{pr}\right)^2 LF_{2,1,0}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i\overline{H}_j H^i H^j-$$

$$2\hbar\lambda\left(\lambda_{H\chi}^{pr}\right)^2 LF_{2,1,0}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i\overline{H}_j\overline{H}_k H^i H^j H^k-2\hbar C_{H^2}\left(\lambda_{H\chi}^{pr}\right)^2 LF_{3,1,-1}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i\overline{H}_j H^i H^j+$$

$$2\hbar\lambda\left(\lambda_{H\chi}^{pr}\right)^2 LF_{3,1,-1}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i\overline{H}_j\overline{H}_k H^i H^j H^k-$$

$$\frac{4}{3}\hbar\lambda_{H\chi}^{pr}\lambda_{H\chi}^{ps}\lambda_{H\chi}^{rs}LF_{1,1,1,0}\left[M_\chi^p,M_\chi^r,M_\chi^s\right]\overline{H}_i\overline{H}_j\overline{H}_k H^i H^j H^k-\frac{2}{15}\hbar g_Y^4\frac{1}{M_\phi^2}D_\mu\overline{H}_i\overline{H}_j H^i D_\mu H^j-$$

$$\frac{1}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{H}_i D_\mu\overline{H}_j H^i D_\mu H^j+2\hbar\left(\lambda_{H\chi}^{pr}\right)^2 LF_{2,1,0}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i D_\mu\overline{H}_j H^i D_\mu H^j-$$

$$2\hbar\left(\lambda_{H\chi}^{pr}\right)^2 LF_{3,1,-1}\left[M_\chi^p,M_\chi^r\right]\overline{H}_i D_\mu\overline{H}_j H^i D_\mu H^j+\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{Y_d}^{pr}\overline{H}_i\overline{H}_j H^i\left(\overline{d}^r_a\cdot P_L\cdot q^{ajp}\right)-$$

$$\hbar\overline{Y_d}^{pr}\left(\lambda_{H\chi}^{st}\right)^2 LF_{2,1,0}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{d}^r_a\cdot P_L\cdot q^{ajp}\right)+$$

$$\hbar\overline{Y_d}^{pr}\left(\lambda_{H\chi}^{st}\right)^2 LF_{3,1,-1}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{d}^r_a\cdot P_L\cdot q^{ajp}\right)+$$

$$\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{Y_e}^{pr}\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)-$$

$$\frac{1}{2}\hbar\overline{Y_e}^{ps}\overline{Y_e}^{tr}Y_e^{tv}\overline{\lambda_{\psi\chi}}^{su}\lambda_{\psi\chi}^{vu}LF_{2,1,0}\left[M_\phi,M_\chi^u\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)+$$

$$\hbar\overline{Y_e}^{ps}\overline{Y_e}^{tr}Y_e^{tv}\overline{\lambda_{\psi\chi}}^{su}\lambda_{\psi\chi}^{vu}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)-$$

$$\frac{1}{2}\hbar\overline{Y_e}^{ps}\overline{Y_e}^{tr}Y_e^{tv}\overline{\lambda_{\psi\chi}}^{su}\lambda_{\psi\chi}^{vu}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)-$$

$$\hbar\overline{Y_e}^{pr}\left(\lambda_{H\chi}^{st}\right)^2 LF_{2,1,0}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)+$$

$$\hbar\overline{Y_e}^{pr}\left(\lambda_{H\chi}^{st}\right)^2 LF_{3,1,-1}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)-$$

$$\hbar\overline{Y_e}^{ps}\lambda_{H\chi}^{tu}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ru}LF_{1,1,1,0}\left[M_\phi,M_\chi^t,M_\chi^u\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)+$$

$$\frac{1}{2}\hbar\overline{Y_e}^{ps}\lambda_{H\chi}^{tu}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ru}LF_{2,1,1,-1}\left[M_\phi,M_\chi^t,M_\chi^u\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)-$$

$$\frac{1}{2}\hbar\overline{Y_e}^{ps}\lambda_{H\chi}^{tu}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ru}LF_{2,1,1,-1}\left[M_\chi^t,M_\phi,M_\chi^u\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)+$$

$$\frac{1}{2}\hbar\overline{Y_e}^{ps}\lambda_{H\chi}^{tu}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ru}LF_{2,1,1,-1}\left[M_\chi^u,M_\phi,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{e}^r\cdot P_L\cdot l^{jp}\right)+$$

$$\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}Y_e^{rp}\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)-$$

$$\frac{1}{2}\hbar\overline{Y_e}^{st}Y_e^{rv}Y_e^{sp}\overline{\lambda_{\psi\chi}}^{tu}\lambda_{\psi\chi}^{vu}LF_{2,1,0}\left[M_\phi,M_\chi^u\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)+$$

$$\hbar\overline{Y_e}^{st}Y_e^{rv}Y_e^{sp}\overline{\lambda_{\psi\chi}}^{tu}\lambda_{\psi\chi}^{vu}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)-$$

$$\frac{1}{2}\hbar\overline{Y_e}^{st}Y_e^{rv}Y_e^{sp}\overline{\lambda_{\psi\chi}}^{tu}\lambda_{\psi\chi}^{vu}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)-$$

$$\hbar Y_e^{rp}\left(\lambda_{H\chi}^{st}\right)^2 LF_{2,1,0}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)+$$

$$\hbar Y_e^{rp}\left(\lambda_{H\chi}^{st}\right)^2 LF_{3,1,-1}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)-$$

$$\hbar Y_e^{rt}\lambda_{H\chi}^{su}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{tu}LF_{1,1,1,0}\left[M_\phi,M_\chi^s,M_\chi^u\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)+$$

$$\frac{1}{2}\hbar Y_e^{rt}\lambda_{H\chi}^{su}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{tu}LF_{2,1,1,-1}\left[M_\phi,M_\chi^s,M_\chi^u\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)+$$

$$\frac{1}{2}\hbar Y_e^{rt}\lambda_{H\chi}^{su}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{tu}LF_{2,1,1,-1}\left[M_\chi^s,M_\phi,M_\chi^u\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)-$$

$$\frac{1}{2}\hbar Y_e^{rt}\lambda_{H\chi}^{su}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{tu}LF_{2,1,1,-1}\left[M_\chi^u,M_\phi,M_\chi^s\right]\overline{H}_i H^i H^j\left(\overline{l}^r_j\cdot P_R\cdot e^p\right)+$$

$$\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}Y_d^{rp}\overline{H}_i H^i H^j\left(\overline{q}^r_{aj}\cdot P_R\cdot d^{ap}\right)-$$

$$\hbar Y_d^{rp}\left(\lambda_{H\chi}^{st}\right)^2 LF_{2,1,0}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i H^i H^j\left(\overline{q}^r_{aj}\cdot P_R\cdot d^{ap}\right)+$$

$$\hbar Y_d^{rp}\left(\lambda_{H\chi}^{st}\right)^2 LF_{3,1,-1}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i H^i H^j\left(\overline{q}^r_{aj}\cdot P_R\cdot d^{ap}\right)+$$

$$\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}Y_u^{rp}\overline{H}_i\overline{H}_j H^i\left(\overline{q}^r_{ak}\cdot P_R\cdot u^{ap}\right)\varepsilon^{kj}-$$

$$\hbar Y_u^{rp}\left(\lambda_{H\chi}^{st}\right)^2 LF_{2,1,0}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{q}^r_{ak}\cdot P_R\cdot u^{ap}\right)\varepsilon^{kj}+$$

$$\hbar Y_u^{rp}\left(\lambda_{H\chi}^{st}\right)^2 LF_{3,1,-1}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i\overline{H}_j H^i\left(\overline{q}^r_{ak}\cdot P_R\cdot u^{ap}\right)\varepsilon^{kj}+$$

$$\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{Y_u}^{pr}\overline{H}_i H^i H^k\left(\overline{u}^r_a\cdot P_L\cdot q^{ajp}\right)\overline{\varepsilon}_{jk}-$$

$$\hbar\overline{Y_u}^{pr}\left(\lambda_{H\chi}^{st}\right)^2 LF_{2,1,0}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i H^i H^k\left(\overline{u}^r_a\cdot P_L\cdot q^{ajp}\right)\overline{\varepsilon}_{jk}+$$

$$\hbar\overline{Y_u}^{pr}\left(\lambda_{H\chi}^{st}\right)^2 LF_{3,1,-1}\left[M_\chi^s,M_\chi^t\right]\overline{H}_i H^i H^k\left(\overline{u}^r_a\cdot P_L\cdot q^{ajp}\right)\overline{\varepsilon}_{jk}-$$

$$\frac{2i}{45}\hbar g_Y^4\frac{1}{M_\phi^2}D_\mu\overline{H}_i H^i\left(\overline{d}^r_a\cdot\gamma_\mu P_R\cdot d^{ar}\right)+\frac{2i}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{H}_i D_\mu H^i\left(\overline{d}^r_a\cdot\gamma_\mu P_R\cdot d^{ar}\right)-$$

$$\frac{2i}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{pr}D_\mu\overline{H}_i H^i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot e^p\right)+\frac{2i}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{pr}\overline{H}_i D_\mu H^i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot e^p\right)-$$

$$\frac{i}{4}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{rs}LF_{3,1,-1}\left[M_\phi,M_\chi^s\right]D_\mu\overline{H}_i H^i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot e^p\right)+$$

$$\frac{i}{4}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{rs}LF_{3,1,-1}\left[M_\phi,M_\chi^s\right]\overline{H}_i D_\mu H^i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot e^p\right)+$$

$$\frac{i}{12}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{rs}LF_{4,1,-2}\left[M_\phi,M_\chi^s\right]D_\mu\overline{H}_i H^i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot e^p\right)-$$

$$\frac{i}{12}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{rs}LF_{4,1,-2}\left[M_\phi,M_\chi^s\right]\overline{H}_i D_\mu H^i\left(\overline{e}^r\cdot\gamma_\mu P_R\cdot e^p\right)-$$

$$\frac{i}{2}\hbar\overline{Y_e}^{ps}Y_e^{ru}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ut}LF_{2,1,0}\left[M_\phi,M_\chi^t\right]D_\mu\overline{H}_i H^j\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{ip}\right)+$$

$$\frac{i}{2}\hbar\overline{Y_e}^{ps}Y_e^{ru}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ut}LF_{2,1,0}\left[M_\phi,M_\chi^t\right]\overline{H}_i D_\mu H^j\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{ip}\right)+$$

$$i\hbar\overline{Y_e}^{ps}Y_e^{ru}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ut}LF_{3,1,-1}\left[M_\phi,M_\chi^t\right]D_\mu\overline{H}_i H^j\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{ip}\right)-$$

$$i\hbar\overline{Y_e}^{ps}Y_e^{ru}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ut}LF_{3,1,-1}\left[M_\phi,M_\chi^t\right]\overline{H}_i D_\mu H^j\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{ip}\right)-$$

$$\frac{i}{2}\hbar\overline{Y_e}^{ps}Y_e^{ru}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ut}LF_{4,1,-2}\left[M_\phi,M_\chi^t\right]D_\mu\overline{H}_i H^j\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{ip}\right)+$$

$$\frac{i}{2}\hbar\overline{Y_e}^{ps}Y_e^{ru}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{ut}LF_{4,1,-2}\left[M_\phi,M_\chi^t\right]\overline{H}_i D_\mu H^j\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{ip}\right)-$$

$$\frac{i}{15}\hbar g_Y^4\frac{1}{M_\phi^2}D_\mu\overline{H}_i H^i\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{jr}\right)+\frac{i}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{H}_i D_\mu H^i\left(\overline{l}^r_j\cdot\gamma_\mu P_L\cdot l^{jr}\right)+$$

$$\frac{i}{45}\hbar g_Y^4\frac{1}{M_\phi^2}D_\mu\overline{H}_i H^i\left(\overline{q}^r_{aj}\cdot\gamma_\mu P_L\cdot q^{ajr}\right)-\frac{i}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{H}_i D_\mu H^i\left(\overline{q}^r_{aj}\cdot\gamma_\mu P_L\cdot q^{ajr}\right)+$$

$$\frac{4i}{45}\hbar g_Y^4\frac{1}{M_\phi^2}D_\mu\overline{H}_i H^i\left(\overline{u}^r_a\cdot\gamma_\mu P_R\cdot u^{ar}\right)-\frac{4i}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\overline{H}_i D_\mu H^i\left(\overline{u}^r_a\cdot\gamma_\mu P_R\cdot u^{ar}\right)+$$

$$\frac{i}{4}\hbar\overline{Y_e}^{ps}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{rt}LF_{3,1,-1}\left[M_\phi,M_\chi^t\right]\overline{H}_i B^{\mu\nu}\left(\overline{e}^r\cdot\Gamma_{\mu\nu}P_L\cdot l^{ip}\right)-$$

$$\frac{i}{4}\hbar\overline{Y_e}^{ps}\overline{\lambda_{\psi\chi}}^{st}\lambda_{\psi\chi}^{rt}LF_{4,1,-2}\left[M_\phi,M_\chi^t\right]\overline{H}_i B^{\mu\nu}\left(\overline{e}^r\cdot\Gamma_{\mu\nu}P_L\cdot l^{ip}\right)+$$

$$\frac{i}{4}\hbar Y_e^{rt}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{ts}LF_{3,1,-1}\left[M_\phi,M_\chi^s\right]H^i B^{\mu\nu}\left(\overline{l}^r_i\cdot\Gamma_{\mu\nu}P_R\cdot e^p\right)-$$

$$\frac{i}{4}\hbar Y_e^{rt}\overline{\lambda_{\psi\chi}}^{ps}\lambda_{\psi\chi}^{ts}LF_{4,1,-2}\left[M_\phi,M_\chi^s\right]H^i B^{\mu\nu}\left(\overline{l}^r_i\cdot\Gamma_{\mu\nu}P_R\cdot e^p\right)-$$

$$\frac{2}{135}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{as}\right)\left(\overline{d}^t_b\cdot\gamma_\mu P_R\cdot d^{bt}\right)-$$

$$\frac{1}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{ps}\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^r\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^p\right)-$$

$$\frac{1}{4}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{tu}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\delta_{ps}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^r\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^p\right)+$$

$$\frac{1}{12}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{tu}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\delta_{ps}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^r\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^p\right)+$$

$$\frac{1}{16}\hbar\overline{\lambda_{\psi\chi}}^{pu}\overline{\lambda_{\psi\chi}}^{rv}\lambda_{\psi\chi}^{su}\lambda_{\psi\chi}^{tv}LF_{2,1,1,-1}\left[M_\phi,M_\chi^u,M_\chi^v\right]\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^r\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^p\right)-$$

$$\frac{1}{16}\hbar\overline{\lambda_{\psi\chi}}^{pu}\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{sv}\lambda_{\psi\chi}^{tv}LF_{2,1,1,-1}\left[M_\phi,M_\chi^u,M_\chi^v\right]\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^r\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^p\right)-$$

$$\frac{4}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{ps}\delta_{rt}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{ap}\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)-$$

$$\frac{1}{6}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{tu}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\delta_{ps}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{ap}\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)+$$

$$\frac{1}{18}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{tu}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\delta_{ps}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{ap}\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)-$$

$$\frac{1}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{ps}\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)-$$

$$\frac{1}{4}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{tu}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\delta_{ps}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)+$$

$$\frac{1}{12}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{tu}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\delta_{ps}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)+$$

$$\frac{1}{16}\hbar\overline{\lambda_{\psi\chi}}^{pu}\overline{\lambda_{\psi\chi}}^{rv}\lambda_{\psi\chi}^{su}\lambda_{\psi\chi}^{tv}LF_{2,1,1,-1}\left[M_\phi,M_\chi^u,M_\chi^v\right]\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)-$$

$$\frac{1}{16}\hbar\overline{\lambda_{\psi\chi}}^{pu}\overline{\lambda_{\psi\chi}}^{ru}\lambda_{\psi\chi}^{sv}\lambda_{\psi\chi}^{tv}LF_{2,1,1,-1}\left[M_\phi,M_\chi^u,M_\chi^v\right]\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{e}^t\cdot\gamma_\mu P_R\cdot e^r\right)-$$

$$\frac{2}{15}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{ps}\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{l}^t_i\cdot\gamma_\mu P_L\cdot l^{ir}\right)-$$

$$\frac{1}{4}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{pu}\lambda_{\psi\chi}^{su}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{l}^t_i\cdot\gamma_\mu P_L\cdot l^{ir}\right)+$$

$$\frac{1}{12}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{pu}\lambda_{\psi\chi}^{su}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{l}^t_i\cdot\gamma_\mu P_L\cdot l^{ir}\right)-$$

$$\frac{2}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{as}\right)\left(\overline{l}^t_i\cdot\gamma_\mu P_L\cdot l^{it}\right)-\frac{1}{30}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{l}^s_i\cdot\gamma_\mu P_L\cdot l^{is}\right)\left(\overline{l}^t_j\cdot\gamma_\mu P_L\cdot l^{jt}\right)+$$

$$\frac{2}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{ps}\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{q}^t_{ai}\cdot\gamma_\mu P_L\cdot q^{air}\right)+$$

$$\frac{1}{12}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{pu}\lambda_{\psi\chi}^{su}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{q}^t_{ai}\cdot\gamma_\mu P_L\cdot q^{air}\right)-$$

$$\frac{1}{36}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{pu}\lambda_{\psi\chi}^{su}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{q}^t_{ai}\cdot\gamma_\mu P_L\cdot q^{air}\right)+$$

$$\frac{1}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{l}^s_i\cdot\gamma_\mu P_L\cdot l^{is}\right)\left(\overline{q}^t_{aj}\cdot\gamma_\mu P_L\cdot q^{ajt}\right)+$$

$$\frac{2}{135}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{as}\right)\left(\overline{q}^t_{bi}\cdot\gamma_\mu P_L\cdot q^{bit}\right)-$$

$$\frac{1}{270}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{q}^s_{ai}\cdot\gamma_\mu P_L\cdot q^{ais}\right)\left(\overline{q}^t_{bj}\cdot\gamma_\mu P_L\cdot q^{bjt}\right)+$$

$$\frac{8}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\delta_{ps}\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{u}^t_a\cdot\gamma_\mu P_R\cdot u^{ar}\right)+$$

$$\frac{1}{3}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{pu}\lambda_{\psi\chi}^{su}LF_{3,1,-1}\left[M_\phi,M_\chi^u\right]\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{u}^t_a\cdot\gamma_\mu P_R\cdot u^{ar}\right)-$$

$$\frac{1}{9}\hbar g_Y^2\overline{\lambda_{\psi\chi}}^{pu}\lambda_{\psi\chi}^{su}LF_{4,1,-2}\left[M_\phi,M_\chi^u\right]\delta_{rt}\left(\overline{e}^s\cdot\gamma_\mu P_R\cdot e^p\right)\left(\overline{u}^t_a\cdot\gamma_\mu P_R\cdot u^{ar}\right)+$$

$$\frac{4}{45}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{l}^s_i\cdot\gamma_\mu P_L\cdot l^{is}\right)\left(\overline{u}^t_a\cdot\gamma_\mu P_R\cdot u^{at}\right)+\frac{8}{135}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{d}^s_a\cdot\gamma_\mu P_R\cdot d^{as}\right)\left(\overline{u}^t_b\cdot\gamma_\mu P_R\cdot u^{bt}\right)-$$

$$\frac{4}{135}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{q}^s_{ai}\cdot\gamma_\mu P_L\cdot q^{ais}\right)\left(\overline{u}^t_b\cdot\gamma_\mu P_R\cdot u^{bt}\right)-$$

$$\frac{8}{135}\hbar g_Y^4\frac{1}{M_\phi^2}\left(\overline{u}^s_a\cdot\gamma_\mu P_R\cdot u^{as}\right)\left(\overline{u}^t_b\cdot\gamma_\mu P_R\cdot u^{bt}\right)$$