

$$\begin{aligned}
& \frac{1}{2} \hbar \cdot B^{\nu\lambda 2} - \frac{1}{4} \frac{1}{g^{\nu 2}} B^{\nu\lambda 2} \cdot \frac{1}{3} \frac{1}{\epsilon} G^{\nu\lambda 2} - \frac{1}{4} \frac{1}{g^{\nu 2}} G^{\nu\lambda 2} - \frac{1}{2} \frac{1}{\epsilon} W^{\nu\lambda 2} - \\
& \frac{1}{4} W^{\nu\lambda 2} - \frac{1}{18} B^{\mu\nu 2} \text{Log} \left[\frac{\overline{m^2}}{M_\phi^2} \right] - \frac{1}{3} \hbar G^{\mu\nu\lambda 2} \text{Log} \left[\frac{\overline{m^2}}{M_\phi^2} \right] - \frac{1}{2} \hbar W^{\mu\nu\lambda 2} \text{Log} \left[\frac{\overline{m^2}}{M_\phi^2} \right] + \\
& D_\mu \bar{H}_i D_\mu H^i + C_{H^2} \bar{H}_i H^i + i \left(\overline{d_a^c} \cdot \gamma_\mu P_R \cdot D_\mu d^a \right) + i \left(\overline{e^c} \cdot \gamma_\mu P_R \cdot D_\mu e^c \right) + \\
& i \left(\overline{l_i^c} \cdot \gamma_\mu P_L \cdot D_\mu l^i \right) + i \left(\overline{q_{a1}^c} \cdot \gamma_\mu P_L \cdot D_\mu q^a \right) + i \left(\overline{u_a^c} \cdot \gamma_\mu P_R \cdot D_\mu u^a \right) - \frac{1}{2} \lambda \bar{H}_i \bar{H}_j H^i H^j + \\
& \frac{1}{2} \hbar \frac{1}{\epsilon} \lambda_{HX} P^R \lambda_{HX} P^R \bar{H}_i \bar{H}_j H^i H^j + \frac{1}{2} \hbar \lambda_{HX} P^R \lambda_{HX} P^R L F_{1,1,0} [M_X^P, M_X^r] \bar{H}_i \bar{H}_j H^i H^j - \\
& \overline{Y_d^P} \bar{H}_i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) - \frac{1}{8} \hbar \overline{Y_d^P} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} \bar{H}_i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) + \\
& \frac{1}{4} \hbar \frac{1}{\epsilon} \overline{Y_d^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} \bar{H}_i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) + \frac{1}{2} \hbar \overline{Y_d^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{1,1,0} [M_\phi, M_X^t] \bar{H}_i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) - \\
& \frac{1}{4} \hbar \overline{Y_d^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{2,1,-1} [M_\phi, M_X^t] \bar{H}_i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) - \overline{Y_e^P} \bar{H}_i \left(\overline{e^c} \cdot P_L \cdot l^{1p} \right) - \\
& Y_e^P H^i \left(\overline{l_i^c} \cdot P_R \cdot e^p \right) - Y_d^P H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot d^{a1p} \right) - \frac{1}{8} \hbar Y_d^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot d^{a1p} \right) + \\
& \frac{1}{4} \hbar \frac{1}{\epsilon} Y_d^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot d^{a1p} \right) + \frac{1}{2} \hbar Y_d^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{1,1,0} [M_\phi, M_X^t] H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot d^{a1p} \right) - \\
& \frac{1}{4} \hbar Y_d^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{2,1,-1} [M_\phi, M_X^t] H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot d^{a1p} \right) - Y_u^P \bar{H}_i \left(\overline{q_{a1}^c} \cdot P_R \cdot u^{a1p} \right) \varepsilon^{j1} - \\
& \frac{1}{4} \hbar Y_u^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot u^{a1p} \right) \varepsilon^{j1} + \frac{1}{4} \hbar \frac{1}{\epsilon} Y_u^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} H^i \left(\overline{q_{a1}^c} \cdot P_R \cdot u^{a1p} \right) \varepsilon^{j1} + \\
& \frac{1}{2} \hbar Y_u^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{1,1,0} [M_\phi, M_X^t] \bar{H}_i \left(\overline{q_{a1}^c} \cdot P_R \cdot u^{a1p} \right) \varepsilon^{j1} - \\
& \frac{1}{4} \hbar Y_u^S \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{2,1,-1} [M_\phi, M_X^t] \bar{H}_i \left(\overline{q_{a1}^c} \cdot P_R \cdot u^{a1p} \right) \varepsilon^{j1} - \overline{Y_u^P} H^j \left(\overline{u_a^c} \cdot P_L \cdot q^{a1p} \right) \overline{\varepsilon}_{ij} - \\
& \frac{1}{4} \hbar \overline{Y_u^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} H^j \left(\overline{u_a^c} \cdot P_L \cdot q^{a1p} \right) \overline{\varepsilon}_{ij} + \frac{1}{4} \hbar \frac{1}{\epsilon} \overline{Y_u^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} H^j \left(\overline{u_a^c} \cdot P_L \cdot q^{a1p} \right) \overline{\varepsilon}_{ij} + \\
& \frac{1}{2} \hbar \overline{Y_u^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{1,1,0} [M_\phi, M_X^t] H^j \left(\overline{u_a^c} \cdot P_L \cdot q^{a1p} \right) \overline{\varepsilon}_{ij} - \\
& \frac{1}{4} \hbar \overline{Y_u^S} \overline{\lambda_{\psi X}}^{\text{pt}} \lambda_{\psi X}^{\text{st}} L F_{2,1,-1} [M_\phi, M_X^t] H^j \left(\overline{u_a^c} \cdot P_L \cdot q^{a1p} \right) \overline{\varepsilon}_{ij} + \frac{1}{90} \hbar \frac{1}{M_\phi^2} G^{\mu\nu C} G^{\mu\nu B} G^{\nu\rho A} f^{ABC} + \\
& \frac{1}{60} \frac{1}{M_\phi^2} W^{\mu\nu K} W^{\mu\nu J} W^{\nu\rho I} f^{IJK} - \frac{1}{10} \hbar C_H g^4 \frac{1}{M_\phi^2} \bar{H}_i \bar{H}_j H^i H^j - \frac{1}{90} \hbar C_H g^4 \frac{1}{M_\phi^2} \bar{H}_i \bar{H}_j H^i H^j + \\
& \frac{1}{10} \hbar \lambda g^4 \frac{1}{M_\phi^2} \bar{H}_i \bar{H}_j \bar{H}^i \bar{H}^j H^k H^k + \frac{1}{90} \hbar \lambda g^4 \frac{1}{M_\phi^2} \bar{H}_i \bar{H}_j \bar{H}^i \bar{H}^j H^k H^k + \\
& \hbar C_H \lambda_{H^2} P^R \lambda_{HX} P^R L F_{2,1,0} [M_X^P, M_X^r] \bar{H}_i \bar{H}_j H^i H^j - \hbar \lambda \lambda_{HX} P^R \lambda_{HX} P^R L F_{2,1,0} [M_X^P, M_X^r] \bar{H}_i \bar{H}_j \bar{H}^i \bar{H}^j H^k H^k - \\
& \hbar C_H \lambda_{HX} P^R \lambda_{HX} P^R L F_{3,1,-1} [M_X^P, M_X^r] \bar{H}_i \bar{H}_j H^i H^j + \hbar \lambda \lambda_{HX} P^R \lambda_{HX} P^R L F_{3,1,-1} [M_X^P, M_X^r] \bar{H}_i \bar{H}_j \bar{H}^i \bar{H}^j H^k H^k - \\
& \frac{1}{3} \hbar \lambda_{HX} P^R \lambda_{HX} S \lambda_{HX} P^R L F_{1,1,1,0} [M_X^P, M_X^r, M_X^S] \bar{H}_i \bar{H}_j \bar{H}^i \bar{H}^j H^k H^k - \\
& \frac{3}{4} \hbar g^4 \frac{1}{M_\phi^2} \bar{H}_i D_\mu \bar{H}_j H^i D_\mu H^j - \frac{45}{4} \hbar g^4 \frac{1}{M_\phi^2} D_\mu \bar{H}_i \bar{H}_j H^i D_\mu H^j - \frac{1}{90} \hbar g^4 \frac{1}{M_\phi^2} \bar{H}_i D_\mu \bar{H}_j H^i D_\mu H^j + \\
& \hbar \lambda_{HX} P^R \lambda_{HX} P^R L F_{2,1,0} [M_X^P, M_X^r] \bar{H}_i D_\mu \bar{H}_j H^i D_\mu H^j - \hbar \lambda_{HX} P^R \lambda_{HX} P^R L F_{3,1,-1} [M_X^P, M_X^r] \bar{H}_i D_\mu \bar{H}_j H^i D_\mu H^j + \\
& \frac{1}{20} \hbar g^4 \frac{1}{M_\phi^2} \overline{Y_d^P} \bar{H}_i \bar{H}_j H^i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) + \frac{1}{180} \hbar g^4 \frac{1}{M_\phi^2} \overline{Y_d^P} \bar{H}_i \bar{H}_j H^i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) - \\
& \frac{1}{2} \hbar \overline{Y_d^S} \overline{d_a^c} Y_d^S \overline{\lambda_{\psi X}}^{\text{uv}} \lambda_{\psi X}^{\text{tv}} L F_{2,1,0} [M_\phi, M_X^v] \bar{H}_i \bar{H}_j H^i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) + \\
& \hbar \overline{Y_d^S} \overline{d_a^c} Y_d^S \overline{\lambda_{\psi X}}^{\text{uv}} \lambda_{\psi X}^{\text{tv}} L F_{3,1,-1} [M_\phi, M_X^v] \bar{H}_i \bar{H}_j H^i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) - \\
& \frac{1}{2} \hbar \overline{Y_d^S} \overline{d_a^c} Y_d^S \overline{\lambda_{\psi X}}^{\text{uv}} \lambda_{\psi X}^{\text{tv}} L F_{4,1,-2} [M_\phi, M_X^v] \bar{H}_i \bar{H}_j H^i \left(\overline{d_a^c} \cdot P_L \cdot q^{a1p} \right) - \\
& \frac{1}{2} \hbar \overline{Y_d^P} \lambda_{HX}^{\text{st}} \lambda_{HX}^{\text{ts}} L F_{2,1,0} [M_X^S, M_X^t] \bar{H}_i \bar{H}_j H^i \left(\overline{d_a^c} \$$