- Singlet sector:

$$\mu^2 \frac{d}{d\mu^2}\begin{pmatrix} g \\ \gamma \\ \Sigma \\ \Delta_\Sigma \end{pmatrix} = \begin{pmatrix} P_{gg} + e_\Sigma^2 \tilde{P}_{gg} & e_\Sigma^2 \tilde{P}_{g\gamma} & P_{gq} + \frac{e_\Sigma^2}{n_f}\tilde{P}_{gq} & 2\frac{n_u}{n_f}\eta^- \tilde{P}_{gq} \\ e_\Sigma^2 \tilde{P}_{\gamma g} & e_\Sigma^2 \tilde{P}_{\gamma\gamma} & \frac{e_\Sigma^2}{n_f}\tilde{P}_{\gamma q} & 2\frac{n_u}{n_f}\eta^- \tilde{P}_{\gamma q} \\ 2n_f P_{qg} + 2e_\Sigma^2 \tilde{P}_{qg} & 2e_\Sigma^2 \tilde{P}_{q\gamma} & P_{qq} + \frac{e_\Sigma^2}{n_f}\tilde{P}_+ \left(\frac{e_\Sigma^2}{n_f}\right)^2 (\tilde{P}_{qq} - \tilde{P}_+) & 2\frac{n_u}{n_f}\eta^- \tilde{P}_+ + 2\frac{\eta^- e_\Sigma^2}{n_f^2}(\tilde{P}_{qq} - \tilde{P}_+) \\ 4n_d \eta^- \tilde{P}_{qg} & 4n_d \eta^- \tilde{P}_{q\gamma} & 2\frac{n_d}{n_f}\eta^- \tilde{P}_+ + 2\frac{\eta^- e_\Sigma^2}{n_f^2}(\tilde{P}_{qq} - \tilde{P}_+) & P_+ + \frac{e_\Delta^2}{n_f}\tilde{P}_+ + 4\frac{n_u n_d}{n_f^2}(\eta^-)^2 (\tilde{P}_{qq} - \tilde{P}_+) \end{pmatrix} \begin{pmatrix} g \\ \gamma \\ \Sigma \\ \Delta_\Sigma \end{pmatrix}$$

  with

$$\begin{aligned} e_\Sigma^2 &= n_u e_u^2 + n_d e_d^2 \\ e_\Delta^2 &= n_u e_d^2 + n_d e_u^2 \\ \eta^\pm &= \frac{1}{2}(e_u^2 \pm e_d^2) \end{aligned}$$

- Valence sector:

$$\mu^2 \frac{d}{d\mu^2}\begin{pmatrix} V \\ \Delta_V \end{pmatrix} = \begin{pmatrix} P_V + \frac{e_\Sigma^2}{n_f}\tilde{P}_- & 2\frac{n_u}{n_f}\eta^- \tilde{P}_- \\ 2\frac{n_d}{n_f}\eta^- \tilde{P}_- & P_- + \frac{e_\Delta^2}{n_f}\tilde{P}_- \end{pmatrix} \begin{pmatrix} V \\ \Delta_V \end{pmatrix}$$