

- Singlet sector:

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

with $e_\Delta^2 = n_u e_d^2 + n_d e_u^2$

- Valence sector:

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