- Singlet sector:

$$\mu^2 \frac{d}{d\mu^2} \begin{pmatrix} g \\ \gamma \\ \Sigma \\ \Delta_\Sigma \end{pmatrix} = \begin{pmatrix} P_{gg} + n_f \langle e^2 \rangle \tilde{P}_{gg} & n_f \langle e^2 \rangle \tilde{P}_{g\gamma} & P_{gq} + \langle e^2 \rangle \tilde{P}_{gq} & \nu_u e_-^2 \tilde{P}_{gq} \\ n_f \langle e^2 \rangle \tilde{P}_{\gamma g} & n_f \langle e^2 \rangle \tilde{P}_{\gamma\gamma} & \langle e^2 \rangle \tilde{P}_{\gamma q} & \nu_u e_-^2 \tilde{P}_{\gamma q} \\ 2n_f (P_{qg} + \langle e^2 \rangle \tilde{P}_{qg}) & 2n_f \langle e^2 \rangle \tilde{P}_{q\gamma} & P_{qq} + \langle e^2 \rangle \Big(\tilde{P}_+ + \langle e^2 \rangle (\tilde{P}_{qq} - \tilde{P}_+) \Big) & \nu_u e^- \Big(\tilde{P}_+ + \langle e^2 \rangle (\tilde{P}_{qq} - \tilde{P}_+) \Big) \\ 2n_f \nu_d e^- \tilde{P}_{qg} & 2n_f \nu_d e^- \tilde{P}_{q\gamma} & \nu_d e^- \Big(\tilde{P}_+ + \langle e^2 \rangle (\tilde{P}_{qq} - \tilde{P}_+) \Big) & P_+ + e_\Delta^2 \tilde{P}_+ + \nu_u \nu_d (e^-)^2 (\tilde{P}_{qq} - \tilde{P}_+) \end{pmatrix} \begin{pmatrix} g \\ \gamma \\ \Sigma \\ \Delta_\Sigma \end{pmatrix}$$

  with

$$\begin{aligned} \langle e^2 \rangle &= \frac{n_u e_u^2 + n_d e_d^2}{n_f} \\ e_\Delta^2 &= \frac{n_u e_d^2 + n_d e_u^2}{n_f} \\ e_-^2 &= e_u^2 - e_d^2 \\ \nu_u &= \frac{n_u}{n_f} \\ \nu_d &= \frac{n_d}{n_f} \end{aligned}$$

- Valence sector:

$$\mu^2 \frac{d}{d\mu^2} \begin{pmatrix} V \\ \Delta_V \end{pmatrix} = \begin{pmatrix} P_V + \langle e^2 \rangle \tilde{P}_- & \nu_u e_-^2 \tilde{P}_- \\ \nu_d e_-^2 \tilde{P}_- & P_- + e_\Delta^2 \tilde{P}_- \end{pmatrix} \begin{pmatrix} V \\ \Delta_V \end{pmatrix}$$