1 definitions

$$\beta := \sqrt{1-\rho} \tag{1}$$
$$\chi := \frac{1-\beta}{1+\beta} \tag{2}$$

2 Photoproduction

$$\sigma^{(0)}_{\gamma g}(\rho) = \sigma^{(0)}_{\gamma g} \cdot c^{(0)}_{\gamma g}(\rho) \tag{3}$$
$$\sigma^{(0)}_{\gamma g} = \frac{\alpha_s(\mu^2)\alpha_{QED}e_Q^2}{m_Q^2} \tag{4}$$
$$c^{(0)}_{\gamma g}(\rho) = \frac{\pi\beta\rho}{4}\left(-\frac{3-\beta^4}{\beta}\ln(\chi) + 2\beta^2 - 4\right) \tag{5}$$

$$-\ln(\chi) = \ln(1+\beta) - \ln(1-\beta) \tag{6}$$
$$= -\sum_{k=1}^{\infty}\frac{(-\beta)^k}{k} + \sum_{k=1}^{\infty}\frac{\beta^k}{k} \tag{7}$$
$$= \sum_{k=1}^{\infty}\frac{2}{2k-1}\beta^{2k-1} \tag{8}$$
$$-(3-\beta^4)\ln(\chi) = 6\beta + 2\beta^3 + 2\sum_{k=3}^{\infty}\beta^{2k-1}\left(\frac{3}{2k-1} - \frac{1}{2k-5}\right) \tag{9}$$
$$c^{(0)}_{\gamma g}(\rho) = \frac{\pi}{2}\left(\beta + \beta^3 - \frac{12}{5}\beta^5 + \sum_{k=4}^{\infty}\beta^{2k-1}\left(\frac{3}{2k-1} - \frac{3}{2k-3} - \frac{1}{2k-5} + \frac{1}{2k-7}\right)\right) \tag{10}$$