

One Loop Matching for Quasi PDF

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1 Diagrams

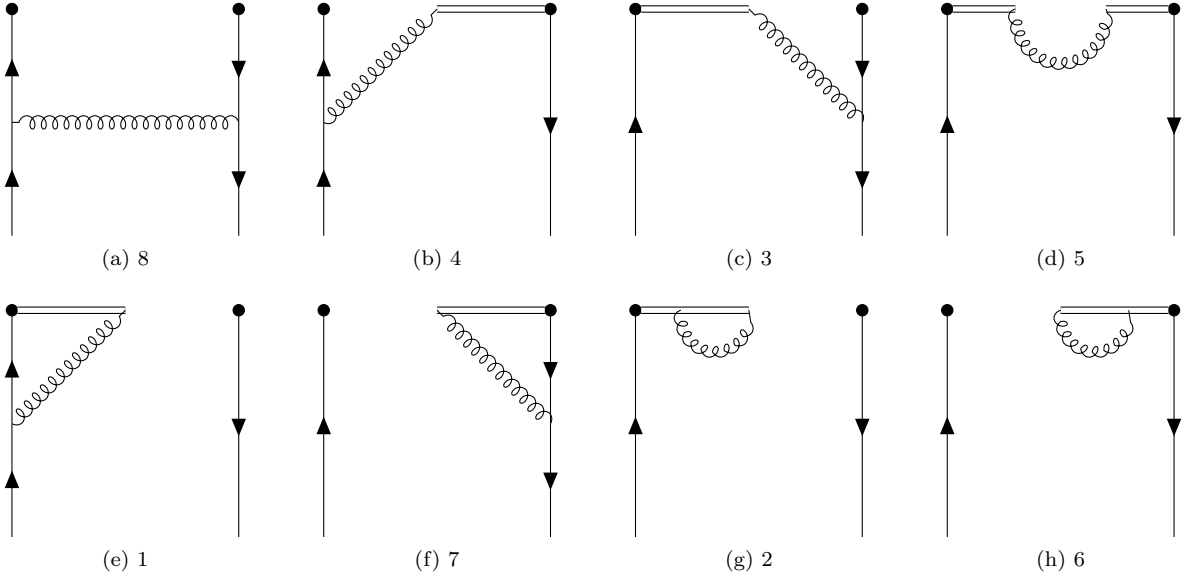


Figure 1: Diagrams of quasi PDF in Feynman gauge.

2 Analytic Results

$$\Gamma_a = \tilde{q}_{11} = \frac{\alpha_S C_F}{2\pi} \begin{cases} (x-1) \ln \frac{x-1}{x} + 1, & x > 1 \\ (1-x) \ln \frac{(P^z)^2}{m^2} + (1-x) \ln \frac{4x}{1-x} + 1 - \frac{2x}{1-x}, & 0 < x < 1 \\ (x-1) \ln \frac{x}{x-1} - 1, & x < 0 \end{cases} \quad (1)$$

$$\Gamma_b = \tilde{q}_{12} = \frac{\alpha_S C_F}{2\pi} \begin{cases} -\frac{2x}{1-x} \ln \frac{x-1}{x} - \frac{1}{1-x}, & x > 1 \\ \frac{2x}{1-x} \ln \frac{(P^z)^2}{m^2} + \frac{2x}{1-x} \ln \frac{4x}{1-x} + 1 - \frac{x}{1-x}, & 0 < x < 1 \\ -\frac{2x}{1-x} \ln \frac{x}{x-1} + \frac{1}{1-x}, & x < 0 \end{cases} \quad (2)$$

$$\Gamma_d = \tilde{q}_{13} = \frac{\alpha_S C_F}{2\pi} \begin{cases} \frac{1}{1-x}, & x > 1 \\ -\frac{1}{1-x}, & 0 < x < 1 \\ -\frac{1}{1-x}, & x < 0 \end{cases} \quad (3)$$

3 Numerical Results ($z = 1/4$)

Diagram a/8

$$0.349565 \text{ CV}(1,3) \text{ CV}(2,4/3) - 0.477465 \text{ CV}(1,3) \text{ CV}(2,4/3) \log(s)$$

Diagram b/4

$$0.212207 \text{ CV}(1,3) \text{ CV}(2,4/3) \log(s) - 0.273255 \text{ CV}(1,3) \text{ CV}(2,4/3)$$

Diagram c/3

$$0.212207 \text{ CV}(1,3) \text{ CV}(2,4/3) \log(s) - 0.273255 \text{ CV}(1,3) \text{ CV}(2,4/3)$$

Diagram d/5

(-0.8488263632 +- 0)*CV(1,3)*CV(2,4/3)