

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,1)} = i\pi \mathbf{T}_{s-u}$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,2)} = 0$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,3)} = 0,$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,4)} = -i\pi \frac{\zeta_3}{24} C_A (C_A - \mathbf{T}_t^2)^2 \mathbf{T}_{s-u},$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,5)} = -i\pi \frac{\zeta_4}{128} C_A (C_A - \mathbf{T}_t^2)^3 \mathbf{T}_{s-u},$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,6)} = -i\pi \frac{\zeta_5}{640} C_A (C_A - \mathbf{T}_t^2)^4 \mathbf{T}_{s-u},$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,7)} = i\pi \frac{1}{720} \left[\frac{\zeta_3^2}{16} C_A^2 (C_A - \mathbf{T}_t^2)^4 + \frac{1}{32} (\zeta_3^2 - 5\zeta_6) C_A (C_A - \mathbf{T}_t^2)^5 \right] \mathbf{T}_{s-u},$$

$$\mathbf{\Gamma}_{\text{NLL}}^{(-,8)} = i\pi \frac{1}{5040} \left[\frac{3\zeta_3\zeta_4}{32} C_A^2 (C_A - \mathbf{T}_t^2)^5 + \frac{3}{64} (\zeta_3\zeta_4 - 3\zeta_7) C_A (C_A - \mathbf{T}_t^2)^6 \right] \mathbf{T}_{s-u}.$$