

$$\hat{\mathcal{M}}_{ij \rightarrow ij}^{(1)} = i\pi \frac{1}{2\epsilon} \mathbf{T}_{s-u}^2 \mathcal{M}_{ij \rightarrow ij}^{(\text{tree})}$$

$$\hat{\mathcal{M}}_{ij \rightarrow ij}^{(2)} = i\pi C_2 \left[\frac{1}{8\epsilon^2} - \frac{\zeta(2)}{8} \right] \mathbf{T}_{s-u}^2 \mathcal{M}_{ij \rightarrow ij}^{(\text{tree})}$$

$$\hat{\mathcal{M}}_{ij \rightarrow ij}^{(3)} = i\pi C_2^2 \left[\frac{1}{48\epsilon^3} - \frac{\zeta(2)}{32\epsilon} - \frac{29}{48} \zeta(3) \right] \mathbf{T}_{s-u}^2 \mathcal{M}_{ij \rightarrow ij}^{(\text{tree})}$$

$$\hat{\mathcal{M}}_{ij \rightarrow ij}^{(4)} = i\pi \left[\frac{C_2^3}{384\epsilon^4} - \frac{C_2^3 \zeta(2)}{192\epsilon^2} - \left(\frac{7}{288} C_2^3 \zeta(3) + \frac{1}{192} C_2^2 C_A \zeta(3) \right) \frac{1}{\epsilon} - \frac{C_2^3 \zeta(4)}{48} - \frac{C_2^2 C_A \zeta(4)}{128} \right] \mathbf{T}_{s-u}^2 \mathcal{M}_{ij \rightarrow ij}^{(\text{tree})}$$

$$\begin{aligned} \hat{\mathcal{M}}_{ij \rightarrow ij}^{(5)} = & i\pi \left[\frac{C_2^4}{3840\epsilon^5} - \frac{C_2^4 \zeta(2)}{1536\epsilon^3} + \left(-\frac{7C_2^4 \zeta(3)}{2304} - \frac{C_2^3 C_A \zeta(3)}{1920} \right) \frac{1}{\epsilon^2} + \left(-\frac{9C_2^4 \zeta(4)}{4096} - \frac{C_2^3 C_A \zeta(4)}{1280} \right) \frac{1}{\epsilon} \right. \\ & \left. + C_2^4 \left(\frac{35\zeta(2)\zeta(3)}{4608} - \frac{293\zeta(5)}{1280} \right) + C_2^3 C_A \left(\frac{1}{768} \zeta(2)\zeta(3) + \frac{253\zeta(5)}{1920} \right) - \frac{1}{48} C_2^2 C_A^2 \zeta(5) \right] \mathbf{T}_{s-u}^2 \mathcal{M}_{ij \rightarrow ij}^{(\text{tree})} \end{aligned}$$