

$$F_4(x, y; \Gamma_1, \Gamma_2, \Gamma_3, \Gamma_4)^{q_1 q_2 q_3 q_4} = \text{Tr} [\Gamma_1 S_F^{q_1}(x, y) \Gamma_2 S_F^{q_2}(y, x) \Gamma_3 S_F^{q_3}(x, y) \Gamma_4 S_F^{q_4}(y, x)] , \quad (1)$$

$$F_2(x, y; \Gamma_1, \Gamma_2)^{q_1 q_2} = \text{Tr} [\Gamma_1 S_F^{q_1}(x, y) \Gamma_2 S_F^{q_2}(y, x)] , \quad (2)$$

$$F_4'(x, y; \Gamma_1, \Gamma_2, \Gamma_3, \Gamma_4)^{q_1 q_2 q_3 q_4} = \text{Tr} [\Gamma_1 S_F^{q_1}(x, x) \Gamma_2 S_F^{q_2}(x, y) \Gamma_3 S_F^{q_3}(y, y) \Gamma_4 S_F^{q_4}(y, x)] \quad (3)$$

$$F_3(x, y; \Gamma_1, \Gamma_2, \Gamma_3)^{q_1 q_2 q_3} = \text{Tr} [\Gamma_1 S_F^{q_1}(x, x) \Gamma_2 S_F^{q_2}(x, y) \Gamma_3 S_F^{q_3}(y, x)] , \quad (4)$$

$$F_1(x; \Gamma)^q = \text{Tr} [\Gamma S_F^q(x, x)] . \quad (5)$$

$$\begin{aligned} (1-1): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{u}_\gamma u_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\ & = + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \right\rangle \\ & \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \end{aligned} \quad (6)$$

$$\begin{aligned} (1-2): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{u}_\gamma u_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\ & = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{llll} \right\rangle \\ & \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \end{aligned} \quad (7)$$

$$\begin{aligned} (1-3): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{d}_\gamma d_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\ & = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\ & \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \end{aligned} \quad (8)$$

$$\begin{aligned} (1-4): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\ & = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\ & \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \end{aligned} \quad (9)$$

$$\begin{aligned} (1-5): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\ & = - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle, \end{aligned} \quad (10)$$

$$\begin{aligned} (1-6): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\ & = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{c ll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \end{aligned} \quad (11)$$

$$\begin{aligned} (1-7): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_L](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\ & = + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle \\ & \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \end{aligned} \quad (12)$$

$$\begin{aligned}
(1-8): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{13}
\end{aligned}$$

$$\begin{aligned}
(1-9): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{14}
\end{aligned}$$

$$\begin{aligned}
(1-10): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{15}
\end{aligned}$$

$$\begin{aligned}
(1-11): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{16}
\end{aligned}$$

$$\begin{aligned}
(1-12): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{s}_\gamma s_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{17}
\end{aligned}$$

$$\begin{aligned}
(1-13): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle, \tag{18}
\end{aligned}$$

$$\begin{aligned}
(1-14): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{cll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{19}
\end{aligned}$$

$$\begin{aligned}
(1-15): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle, \tag{20}
\end{aligned}$$

$$\begin{aligned}
(1-16): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_L](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle, \tag{21}
\end{aligned}$$

$$\begin{aligned}
(2-1): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{22}$$

$$\begin{aligned}
(2-2): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \right\rangle \\
& \quad - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{lll} \right\rangle,
\end{aligned} \tag{23}$$

$$\begin{aligned}
(2-3): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{d}_\gamma d_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{lll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{24}$$

$$\begin{aligned}
(2-4): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{s}_\gamma s_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{lll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{25}$$

$$\begin{aligned}
(2-5): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{c}_\gamma c_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle,
\end{aligned} \tag{26}$$

$$\begin{aligned}
(2-6): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{c}_\gamma c_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle,
\end{aligned} \tag{27}$$

$$\begin{aligned}
(2-7): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{u}_\gamma u_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{28}$$

$$\begin{aligned}
(2-8): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2\left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle \\
& \quad + 2\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle,
\end{aligned} \tag{29}$$

$$\begin{aligned}
(2-9): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{30}$$

$$\begin{aligned}
(2-10): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle,
\end{aligned} \tag{31}$$

$$\begin{aligned}
(2-11): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{32}$$

$$\begin{aligned}
(2-12): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{33}$$

$$\begin{aligned}
(2-13): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle,
\end{aligned} \tag{34}$$

$$\begin{aligned}
(2-14): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llcl} \right\rangle,
\end{aligned} \tag{35}$$

$$\begin{aligned}
(2-15): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle,
\end{aligned} \tag{36}$$

$$\begin{aligned}
(2-16): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_L](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle,
\end{aligned} \tag{37}$$

$$\begin{aligned}
(3-1): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{38}$$

$$\begin{aligned}
(3-2): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{39}$$

$$\begin{aligned}
(3-3): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_L](x) [(\bar{d}_\gamma d_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \right\rangle \\
& \quad - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \tag{40}
\end{aligned}$$

$$\begin{aligned}
(3-4): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_L](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \tag{41}
\end{aligned}$$

$$\begin{aligned}
(3-5): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_L](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle, \tag{42}
\end{aligned}$$

$$\begin{aligned}
(3-6): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_L](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{cll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \tag{43}
\end{aligned}$$

$$\begin{aligned}
(3-7): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_L](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{44}
\end{aligned}$$

$$\begin{aligned}
(3-8): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_L](x) [(\bar{u}_\gamma u_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{45}
\end{aligned}$$

$$\begin{aligned}
(3-9): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle \\
& \quad - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{lll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{46}
\end{aligned}$$

$$\begin{aligned}
(3-10): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2\left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad - 2\left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle \\
& \quad + 2\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad + 2\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad + 2\left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{47}
\end{aligned}$$

$$\begin{aligned}
(3-11): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{48}
\end{aligned}$$

$$\begin{aligned}
(3-12): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad - 2\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad + 2\left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{49}
\end{aligned}$$

$$\begin{aligned}
(3-13): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle,
\end{aligned} \tag{50}$$

$$\begin{aligned}
(3-14): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llcl} \right\rangle \\
& \quad + 2\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{cl} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*,
\end{aligned} \tag{51}$$

$$\begin{aligned}
(3-15): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{52}$$

$$\begin{aligned}
(3-16): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_L](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{53}$$

$$\begin{aligned}
(4-1): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{s}_\beta s_\beta)_L](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{54}$$

$$\begin{aligned}
(4-2): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{s}_\beta s_\beta)_L](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{55}$$

$$\begin{aligned}
(4-3): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{s}_\beta s_\beta)_L](x)[(\bar{d}_\gamma d_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle,
\end{aligned} \tag{56}$$

$$\begin{aligned}
(4-4): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \big|_{(I)} \right\rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \right\rangle \\
& \quad - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{lll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \tag{57}
\end{aligned}$$

$$\begin{aligned}
(4-5): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle, \tag{58}
\end{aligned}$$

$$\begin{aligned}
(4-6): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \big|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{cll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle, \tag{59}
\end{aligned}$$

$$\begin{aligned}
(4-7): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{60}
\end{aligned}$$

$$\begin{aligned}
(4-8): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{u}_\gamma u_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \big|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{61}
\end{aligned}$$

$$\begin{aligned}
(4-9): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{d}_\gamma d_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \big|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{62}
\end{aligned}$$

$$\begin{aligned}
(4-10): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{d}_\gamma d_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{63}
\end{aligned}$$

$$\begin{aligned}
(4-11): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{s}_\gamma s_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle \\
& \quad - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{64}
\end{aligned}$$

$$\begin{aligned}
(4-12): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{s}_\gamma s_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{llll} \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle \\
& \quad + 2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{65}
\end{aligned}$$

$$\begin{aligned}
(4-13): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{c}_\gamma c_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle, \tag{66}
\end{aligned}$$

$$\begin{aligned}
(4-14): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [(\bar{c}_\gamma c_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llcl} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{cll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{67}
\end{aligned}$$

$$\begin{aligned}
(4-15): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [\bar{s}_\gamma (1 + \gamma_5) d_\gamma](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{68}$$

$$\begin{aligned}
(4-16): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_L](x) [\bar{s}_\gamma (1 - \gamma_5) d_\gamma](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{69}$$

$$\begin{aligned}
(5-1): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{u}_\gamma u_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{70}$$

$$\begin{aligned}
(5-2): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{u}_\gamma u_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{71}$$

$$\begin{aligned}
(5-3): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{d}_\gamma d_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{72}$$

$$\begin{aligned}
(5-4): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{73}$$

$$\begin{aligned}
(5-5): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle,
\end{aligned} \tag{74}$$

$$\begin{aligned}
(5-6): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{dll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{75}$$

$$\begin{aligned}
(5-7): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{u}_\beta u_\beta)_R](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{76}$$

$$\begin{aligned}
(5-8): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{77}
\end{aligned}$$

$$\begin{aligned}
(5-9): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{78}
\end{aligned}$$

$$\begin{aligned}
(5-10): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{79}
\end{aligned}$$

$$\begin{aligned}
(5-11): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{80}
\end{aligned}$$

$$\begin{aligned}
(5-12): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{s}_\gamma s_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{81}
\end{aligned}$$

$$\begin{aligned}
(5-13): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle, \tag{82}
\end{aligned}$$

$$\begin{aligned}
(5-14): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{c ll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{83}
\end{aligned}$$

$$\begin{aligned}
(5-15): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle, \tag{84}
\end{aligned}$$

$$\begin{aligned}
(5-16): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{u}_\beta u_\beta)_R](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle, \tag{85}
\end{aligned}$$

$$\begin{aligned}
(6-1): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{86}
\end{aligned}$$

$$\begin{aligned}
(6-2): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle \\
& \quad + 2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle, \tag{87}
\end{aligned}$$

$$\begin{aligned}
(6-3): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{d}_\gamma d_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{88}
\end{aligned}$$

$$\begin{aligned}
(6-4): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{s}_\gamma s_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^*, \tag{89}
\end{aligned}$$

$$\begin{aligned}
(6-5): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle^*, \tag{90}
\end{aligned}$$

$$\begin{aligned}
(6-6): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llcl} \right\rangle^*, \tag{91}
\end{aligned}$$

$$\begin{aligned}
(6-7): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{u}_\gamma u_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{92}
\end{aligned}$$

$$\begin{aligned}
(6-8): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +4 \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \right\rangle \\
& \quad - 4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^*, \tag{93}
\end{aligned}$$

$$\begin{aligned}
(6-9): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{94}
\end{aligned}$$

$$\begin{aligned}
(6-10): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^*, \tag{95}
\end{aligned}$$

$$\begin{aligned}
(6-11): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{96}
\end{aligned}$$

$$\begin{aligned}
(6-12): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{s}_\gamma s_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^*, \tag{97}
\end{aligned}$$

$$\begin{aligned}
(6-13): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle^*, \tag{98}
\end{aligned}$$

$$\begin{aligned}
(6-14): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle^*, \tag{99}
\end{aligned}$$

$$\begin{aligned}
(6-15): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^*, \tag{100}
\end{aligned}$$

$$\begin{aligned}
(6-16): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle^*, \tag{101}
\end{aligned}$$

$$\begin{aligned}
(7-1): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_R](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{102}
\end{aligned}$$

$$\begin{aligned}
(7-2): & \left\langle [(\bar{s}_\alpha d_\alpha)_L(\bar{d}_\beta d_\beta)_R](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{103}
\end{aligned}$$

$$\begin{aligned}
(7-3): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{d}_\gamma d_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle \\
& \quad - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{104}
\end{aligned}$$

$$\begin{aligned}
(7-4): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{105}
\end{aligned}$$

$$\begin{aligned}
(7-5): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle, \tag{106}
\end{aligned}$$

$$\begin{aligned}
(7-6): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{cll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{107}
\end{aligned}$$

$$\begin{aligned}
(7-7): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{108}
\end{aligned}$$

$$\begin{aligned}
(7-8): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{u}_\gamma u_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{109}
\end{aligned}$$

$$\begin{aligned}
(7-9): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{d}_\gamma d_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^+)^{lll} \right\rangle \\
& + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll*} \right\rangle \\
& - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^+, \Gamma_\nu^-)^{lll} \right\rangle \\
& - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{110}
\end{aligned}$$

$$\begin{aligned}
(7-10): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{d}_\gamma d_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll*} \right\rangle \\
& + 2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{111}
\end{aligned}$$

$$\begin{aligned}
(7-11): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{s}_\gamma s_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^+)^{lll} \right\rangle \\
& - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle, \tag{112}
\end{aligned}$$

$$\begin{aligned}
(7-12): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{s}_\gamma s_\gamma)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{113}
\end{aligned}$$

$$\begin{aligned}
(7-13): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{c}_\gamma c_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle,
\end{aligned} \tag{114}$$

$$\begin{aligned}
(7-14): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [(\bar{c}_\gamma c_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{cll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*,
\end{aligned} \tag{115}$$

$$\begin{aligned}
(7-15): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [\bar{s}_\gamma (1 + \gamma_5) d_\gamma](y) \right|_{(I)} \rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{116}$$

$$\begin{aligned}
(7-16): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{d}_\beta d_\beta)_R](x) [\bar{s}_\gamma (1 - \gamma_5) d_\gamma](y) \right|_{(I)} \rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{117}$$

$$\begin{aligned}
(8-1): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{u}_\gamma u_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{118}$$

$$\begin{aligned}
(8-2): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{u}_\gamma u_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{119}$$

$$\begin{aligned}
(8-3): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{d}_\gamma d_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{llll} \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle \\
& \quad + 2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{120}$$

$$\begin{aligned}
(8-4): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{121}
\end{aligned}$$

$$\begin{aligned}
(8-5): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^c \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{122}
\end{aligned}$$

$$\begin{aligned}
(8-6): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llcl} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{cll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{123}
\end{aligned}$$

$$\begin{aligned}
(8-7): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{124}
\end{aligned}$$

$$\begin{aligned}
(8-8): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{u}_\gamma u_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \right|_{(I)} \rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^*, \tag{125}
\end{aligned}$$

$$\begin{aligned}
(8-9): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{d}_\gamma d_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \right|_{(I)} \rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll*} \right\rangle^* \\
& \quad + 2 \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{126}
\end{aligned}$$

$$\begin{aligned}
(8-10): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{d}_\gamma d_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = -4 \left\langle F_4(x, y; 1 - \gamma_5, 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{llll} \right\rangle \\
& \quad + 4 \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \right\rangle \\
& \quad - 4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^* \\
& \quad - 4 \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \quad (127)
\end{aligned}$$

$$\begin{aligned}
(8-11): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{s}_\gamma s_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \quad (128)
\end{aligned}$$

$$\begin{aligned}
(8-12): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{s}_\gamma s_\gamma)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^* \\
& \quad - 4 \left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 - \gamma_5)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \quad (129)
\end{aligned}$$

$$\begin{aligned}
(8-13): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{c}_\gamma c_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \quad (130)
\end{aligned}$$

$$\begin{aligned}
(8-14): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [(\bar{c}_\gamma c_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^*, \quad (131)
\end{aligned}$$

$$\begin{aligned}
(8-15): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [\bar{s}_\gamma (1 + \gamma_5) d_\gamma](y) \Big|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 - \gamma_5)^l \right\rangle, \quad (132)
\end{aligned}$$

$$\begin{aligned}
(8-16): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{d}_\beta d_\alpha)_R](x) [\bar{s}_\gamma (1 - \gamma_5) d_\gamma](y) \Big|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(x; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{133}$$

$$\begin{aligned}
(9-1): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{u}_\gamma u_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{134}$$

$$\begin{aligned}
(9-2): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{u}_\gamma u_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{135}$$

$$\begin{aligned}
(9-3): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{d}_\gamma d_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{136}$$

$$\begin{aligned}
(9-4): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{s}_\gamma s_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^+)^{llll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle \\
& \quad - \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{137}$$

$$\begin{aligned}
(9-5): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{c}_\gamma c_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle,
\end{aligned} \tag{138}$$

$$\begin{aligned}
(9-6): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{c}_\gamma c_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{cll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{139}$$

$$\begin{aligned}
(9-7): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{u}_\gamma u_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{140}$$

$$\begin{aligned}
(9-8): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{u}_\gamma u_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*,
\end{aligned} \tag{141}$$

$$\begin{aligned}
(9-9): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{d}_\gamma d_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{142}$$

$$\begin{aligned}
(9-10): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{d}_\gamma d_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle,
\end{aligned} \tag{143}$$

$$\begin{aligned}
(9-11): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{s}_\gamma s_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^+)^{llll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll*} \right\rangle \\
& \quad - \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle,
\end{aligned} \tag{144}$$

$$\begin{aligned}
(9-12): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{s}_\gamma s_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll*} \right\rangle^* \\
& \quad + 2 \left\langle F_4'(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{145}
\end{aligned}$$

$$\begin{aligned}
(9-13): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{c}_\gamma c_\gamma)_R (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = - \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle, \tag{146}
\end{aligned}$$

$$\begin{aligned}
(9-14): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [(\bar{c}_\gamma c_\delta)_R (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{cll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^*, \tag{147}
\end{aligned}$$

$$\begin{aligned}
(9-15): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [\bar{s}_\gamma (1 + \gamma_5) d_\gamma](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle, \tag{148}
\end{aligned}$$

$$\begin{aligned}
(9-16): & \left\langle [(\bar{s}_\alpha d_\alpha)_L (\bar{s}_\beta s_\beta)_R](x) [\bar{s}_\gamma (1 - \gamma_5) d_\gamma](y) \Big|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle, \tag{149}
\end{aligned}$$

$$\begin{aligned}
(10-1): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{u}_\beta u_\alpha)_R](x) [(\bar{u}_\gamma u_\gamma)_L (\bar{d}_\delta s_\delta)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{150}
\end{aligned}$$

$$\begin{aligned}
(10-2): & \left\langle [(\bar{s}_\alpha d_\beta)_L (\bar{u}_\beta u_\alpha)_R](x) [(\bar{u}_\gamma u_\delta)_L (\bar{d}_\delta s_\gamma)_L](y) \Big|_{(I)} \right\rangle \\
& = +2 \left\langle F_4'(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{151}
\end{aligned}$$

$$\begin{aligned}
(10-3): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{d}_\gamma d_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{152}
\end{aligned}$$

$$\begin{aligned}
(10-4): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{s}_\gamma s_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{llll} \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle \\
& \quad + 2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle \\
& \quad + 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{153}
\end{aligned}$$

$$\begin{aligned}
(10-5): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^c \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{154}
\end{aligned}$$

$$\begin{aligned}
(10-6): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llcl} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{cll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{155}
\end{aligned}$$

$$\begin{aligned}
(10-7): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{u}_\gamma u_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{156}
\end{aligned}$$

$$\begin{aligned}
(10-8): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^*, \tag{157}
\end{aligned}$$

$$\begin{aligned}
(10-9): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{158}
\end{aligned}$$

$$\begin{aligned}
(10-10): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^* \\
& \quad - 4 \left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{159}
\end{aligned}$$

$$\begin{aligned}
(10-11): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +2 \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll*} \right\rangle \\
& \quad + 2 \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle^* \\
& \quad - 2 \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{160}
\end{aligned}$$

$$\begin{aligned}
(10-12): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{s}_\gamma s_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F_4(x, y; 1 - \gamma_5, 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + 4 \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \right\rangle \\
& \quad - 4 \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle^* \\
& \quad - 4 \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \cdot F_1(y; 1 - \gamma_5)^l \right\rangle, \tag{161}
\end{aligned}$$

$$\begin{aligned}
(10-13): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{ll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle^* \\
& \quad - 2 \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle, \tag{162}
\end{aligned}$$

$$\begin{aligned}
(10-14): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -4 \left\langle F_4'(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle^* \\
& \quad + 4 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle^*, \tag{163}
\end{aligned}$$

$$\begin{aligned}
(10-15): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle, \tag{164}
\end{aligned}$$

$$\begin{aligned}
(10-16): & \left\langle [(\bar{s}_\alpha d_\beta)_L(\bar{u}_\beta u_\alpha)_R](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle, \tag{165}
\end{aligned}$$

$$\begin{aligned}
(11-1): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle, \tag{166}
\end{aligned}$$

$$\begin{aligned}
(11-2): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle, \tag{167}
\end{aligned}$$

$$\begin{aligned}
(11-3): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{d}_\gamma d_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle, \tag{168}
\end{aligned}$$

$$\begin{aligned}
(11-4): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{s}_\gamma s_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle, \tag{169}
\end{aligned}$$

$$\begin{aligned}
(11-5): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^c \right\rangle, \tag{170}
\end{aligned}$$

$$\begin{aligned}
(11-6): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{cl} \right\rangle,
\end{aligned} \tag{171}$$

$$\begin{aligned}
(11-7): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^u \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{172}$$

$$\begin{aligned}
(11-8): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle^*,
\end{aligned} \tag{173}$$

$$\begin{aligned}
(11-9): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^u \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{174}$$

$$\begin{aligned}
(11-10): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^u \cdot F_1(x; 1 + \gamma_5)^l \right\rangle,
\end{aligned} \tag{175}$$

$$\begin{aligned}
(11-11): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^u \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{176}$$

$$\begin{aligned}
(11-12): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{s}_\gamma s_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^u \cdot F_1(x; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{177}$$

$$\begin{aligned}
(11-13): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^u \cdot F_1(x; \Gamma_\mu^-)^{c*} \right\rangle,
\end{aligned} \tag{178}$$

$$\begin{aligned}
(11-14): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll} \right\rangle^*,
\end{aligned} \tag{179}$$

$$\begin{aligned}
(11-15): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^u \right\rangle,
\end{aligned} \tag{180}$$

$$\begin{aligned}
(11-16): & \left\langle [\bar{s}_\alpha(1 - \gamma_5)d_\alpha](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^u \right\rangle,
\end{aligned} \tag{181}$$

$$\begin{aligned}
(12-1): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{182}$$

$$\begin{aligned}
(12-2): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle,
\end{aligned} \tag{183}$$

$$\begin{aligned}
(12-3): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{d}_\gamma d_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{184}$$

$$\begin{aligned}
(12-4): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{s}_\gamma s_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad - \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle,
\end{aligned} \tag{185}$$

$$\begin{aligned}
(12-5): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\gamma)_L(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = -\left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^c \right\rangle,
\end{aligned} \tag{186}$$

$$\begin{aligned}
(12-6): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\delta)_L(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{ell} \right\rangle,
\end{aligned} \tag{187}$$

$$\begin{aligned}
(12-7): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{188}$$

$$\begin{aligned}
(12-8): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{u}_\gamma u_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^*,
\end{aligned} \tag{189}$$

$$\begin{aligned}
(12-9): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{d}_\gamma d_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = +\left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{190}$$

$$\begin{aligned}
(12-10): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{d}_\gamma d_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2\left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle,
\end{aligned} \tag{191}$$

$$\begin{aligned}
(12-11): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 + \gamma_5)^{lll} \right\rangle \\
& \quad + \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle,
\end{aligned} \tag{192}$$

$$\begin{aligned}
(12-12): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{s}_\gamma s_\gamma)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle^* \\
& \quad + 2 \left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 - \gamma_5)^l \right\rangle,
\end{aligned} \tag{193}$$

$$\begin{aligned}
(12-13): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\gamma)_R(\bar{d}_\delta s_\delta)_L](y)|_{(I)} \right\rangle \\
& = + \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \right\rangle,
\end{aligned} \tag{194}$$

$$\begin{aligned}
(12-14): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[(\bar{c}_\gamma c_\delta)_R(\bar{d}_\delta s_\gamma)_L](y)|_{(I)} \right\rangle \\
& = -2 \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll} \right\rangle^*,
\end{aligned} \tag{195}$$

$$\begin{aligned}
(12-15): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[\bar{s}_\gamma(1 + \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \right\rangle,
\end{aligned} \tag{196}$$

$$\begin{aligned}
(12-16): & \left\langle [\bar{s}_\alpha(1 + \gamma_5)d_\alpha](x)[\bar{s}_\gamma(1 - \gamma_5)d_\gamma](y)|_{(I)} \right\rangle \\
& = - \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \right\rangle.
\end{aligned} \tag{197}$$

F_4 -type: 6 independent contractions (including 0 charm-contained ones) / 9 total contractions:

$$\begin{aligned}
& \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{llll} \right\rangle = \left\langle F_4(x, y; 1 - \gamma_5, \Gamma_\nu^-, 1 + \gamma_5, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^+)^{llll} \right\rangle = \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{llll} \right\rangle = \left\langle F_4(x, y; 1 - \gamma_5, \Gamma_\nu^-, 1 + \gamma_5, \Gamma_\nu^+)^{llll} \right\rangle \\
& \left\langle F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^+)^{llll} \right\rangle \\
& \left\langle F_4(x, y; 1 - \gamma_5, 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{llll} \right\rangle
\end{aligned}$$

$F_{2,2}$ -type: 6 independent contractions (including 0 charm-contained ones) / 9 total contractions:

$$\begin{aligned}
& \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll} \right\rangle = \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll*} \right\rangle
\end{aligned}$$

$$\begin{aligned}
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \right\rangle = \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll} \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll*} \right\rangle \\
& \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll*} \right\rangle = \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll*} \right\rangle
\end{aligned}$$

F'_4 -type: 18 independent contractions (including 8 charm-contained ones) / 32 total contractions:

$$\begin{aligned}
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{llll} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llcl} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llcl} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llll} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^+)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^-, \Gamma_\nu^+)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl} \right\rangle = \left\langle F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{clll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll} \right\rangle \\
& \left\langle F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llcl} \right\rangle = \left\langle F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^-)^{clll} \right\rangle
\end{aligned}$$

$F_{3,1}$ -type: 32 independent contractions (including 16 charm-contained ones) / 64 total contractions:

[illegible]

$$\begin{aligned}
\left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle &= \left\langle F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, 1 + \gamma_5)^{lll} \cdot F_1(x; 1 - \gamma_5)^l \right\rangle \\
\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll} \cdot F_1(y; 1 - \gamma_5)^{l*} \right\rangle &= \left\langle F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll} \cdot F_1(x; 1 - \gamma_5)^{l*} \right\rangle \\
\left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle &= \left\langle F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, \Gamma_\mu^-)^{lll} \cdot F_1(x; \Gamma_\mu^-)^c \right\rangle \\
\left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle &= \left\langle F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, 1 - \gamma_5)^{lll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle \\
\left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle &= \left\langle F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, \Gamma_\mu^-)^{lll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \right\rangle \\
\left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{cll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle &= \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 - \gamma_5)^{cll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle \\
\left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll} \cdot F_1(y; 1 + \gamma_5)^{l*} \right\rangle &= \left\langle F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll} \cdot F_1(x; 1 + \gamma_5)^{l*} \right\rangle
\end{aligned}$$

$F_{2,1,1}$ -type: 18 independent contractions (including 8 charm-contained ones) / 32 total contractions:

[illegible]

$$\begin{aligned}
& \left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle = \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle
\end{aligned}$$

F_3 -type: 12 independent contractions (including 4 charm-contained ones) / 24 total contractions:

$$\begin{aligned}
& \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 + \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^+, 1 + \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^+, 1 - \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, 1 + \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, 1 - \gamma_5)^{lll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{cll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 - \gamma_5)^{cll} \right\rangle \\
& \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll} \right\rangle = \left\langle F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll} \right\rangle \\
& \left\langle F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{cll} \right\rangle = \left\langle F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 + \gamma_5)^{cll} \right\rangle \\
& \left\langle F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll} \right\rangle = \left\langle F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll} \right\rangle
\end{aligned}$$

$F_{2,1}$ -type: 12 independent contractions (including 4 charm-contained ones) / 24 total contractions:

$$\begin{aligned}
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle = \left\langle F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^l \right\rangle = \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^l \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle = \left\langle F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{l*} \right\rangle = \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^{l*} \right\rangle \\
& \left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 - \gamma_5)^l \right\rangle = \left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \left\langle F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(x; 1 - \gamma_5)^l \right\rangle = \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(y; 1 - \gamma_5)^l \right\rangle \\
& \left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle = \left\langle F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle
\end{aligned}$$

$$\begin{aligned}
\left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(x; 1 + \gamma_5)^l \right\rangle &= \left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll} \cdot F_1(y; 1 + \gamma_5)^l \right\rangle \\
\left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^c \right\rangle &= \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle \\
\left\langle F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \right\rangle &= \left\langle F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle \\
\left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^c \right\rangle &= \left\langle F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^c \right\rangle \\
\left\langle F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll} \cdot F_1(x; \Gamma_\mu^-)^{c*} \right\rangle &= \left\langle F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll} \cdot F_1(y; \Gamma_\nu^-)^{c*} \right\rangle
\end{aligned}$$

F_2 -type: 3 independent contractions (including 0 charm-contained ones) / 4 total contractions:

$$\begin{aligned}
\left\langle F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll} \right\rangle &= \left\langle F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll} \right\rangle \\
\left\langle F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll} \right\rangle & \\
\left\langle F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll} \right\rangle &
\end{aligned}$$

F_4 -type: 9 traces to be taken:

$$\begin{aligned}
&F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{llll}, \\
&F_4(x, y; \Gamma_\mu^-, 1 - \gamma_5, \Gamma_\mu^-, 1 + \gamma_5)^{llll}, \\
&F_4(x, y; 1 - \gamma_5, \Gamma_\nu^-, 1 + \gamma_5, \Gamma_\nu^-)^{llll}, \\
&F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^+)^{llll}, \\
&F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{llll}, \\
&F_4(x, y; \Gamma_\mu^-, 1 + \gamma_5, \Gamma_\mu^+, 1 - \gamma_5)^{llll}, \\
&F_4(x, y; 1 - \gamma_5, \Gamma_\nu^-, 1 + \gamma_5, \Gamma_\nu^+)^{llll}, \\
&F_4(x, y; \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\mu^+, \Gamma_\nu^+)^{llll}, \\
&F_4(x, y; 1 - \gamma_5, 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{llll},
\end{aligned}$$

F'_4 -type: 32 traces to be taken:

$$\begin{aligned}
&F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll}, \\
&F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl}, \\
&F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{clll}, \\
&F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llll}, \\
&F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llll},
\end{aligned}$$

$$\begin{aligned}
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^-)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{llcl}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{clll}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^+)^{llcl}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5, 1 - \gamma_5)^{clll}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llll}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^-)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llll}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^-, \Gamma_\nu^+)^{llll}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{llcl}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5, 1 + \gamma_5)^{clll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{clll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^+, \Gamma_\nu^-)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^+)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-, \Gamma_\nu^+)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5, 1 + \gamma_5)^{llcl}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^-, \Gamma_\nu^+)^{clll}, \\
& F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-, \Gamma_\nu^-)^{llcl}, \\
& F'_4(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{clll}, \\
& F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^+, \Gamma_\nu^-)^{llll}, \\
& F'_4(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5, 1 + \gamma_5)^{llcl}, \\
& F'_4(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+, \Gamma_\nu^-)^{clll},
\end{aligned}$$

$F_{3,x}$ -type: 18 traces to be taken:

$$\begin{aligned}
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, \Gamma_\nu^-)^{cll}, \\
& F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{lll},
\end{aligned}$$

$$\begin{aligned}
& F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, \Gamma_\nu^-)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, \Gamma_\nu^-)^{lll}, \\
& F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\nu^+)^{cll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{lll}, \\
& F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll}, \\
& F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 - \gamma_5)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^+, 1 + \gamma_5)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 + \gamma_5)^{cll}, \\
& F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 + \gamma_5)^{lll}, \\
& F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll}, \\
& F_3(x, y; \Gamma_\mu^+, \Gamma_\mu^-, 1 - \gamma_5)^{lll}, \\
& F_3(x, y; \Gamma_\mu^-, \Gamma_\mu^-, 1 - \gamma_5)^{cll}, \\
& F_3(x, y; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cll},
\end{aligned}$$

$F_{3,y}$ -type: 18 traces to be taken:

$$\begin{aligned}
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, \Gamma_\mu^-)^{lll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, \Gamma_\mu^-)^{cll}, \\
& F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\mu^+)^{lll}, \\
& F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, \Gamma_\mu^-)^{lll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^+, \Gamma_\mu^-)^{lll}, \\
& F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, \Gamma_\mu^+)^{cll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 - \gamma_5)^{lll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 + \gamma_5)^{lll}, \\
& F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{lll}, \\
& F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{lll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^+, 1 - \gamma_5)^{lll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^+, 1 + \gamma_5)^{lll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 + \gamma_5)^{cll}, \\
& F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, 1 + \gamma_5)^{lll}, \\
& F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 + \gamma_5)^{cll},
\end{aligned}$$

$$\begin{aligned}
& F_3(y, x; \Gamma_\nu^+, \Gamma_\nu^-, 1 - \gamma_5)^{ll}, \\
& F_3(y, x; \Gamma_\nu^-, \Gamma_\nu^-, 1 - \gamma_5)^{cl}, \\
& F_3(y, x; 1 - \gamma_5, 1 + \gamma_5, 1 - \gamma_5)^{cl},
\end{aligned}$$

F_2 -type: 10 traces to be taken:

$$\begin{aligned}
& F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^-)^{ll}, \\
& F_2(x, y; \Gamma_\mu^-, \Gamma_\nu^+)^{ll}, \\
& F_2(x, y; \Gamma_\mu^-, 1 - \gamma_5)^{ll}, \\
& F_2(x, y; \Gamma_\mu^-, 1 + \gamma_5)^{ll}, \\
& F_2(x, y; 1 - \gamma_5, \Gamma_\nu^-)^{ll}, \\
& F_2(x, y; 1 + \gamma_5, \Gamma_\nu^-)^{ll}, \\
& F_2(x, y; 1 - \gamma_5, 1 + \gamma_5)^{ll}, \\
& F_2(x, y; 1 + \gamma_5, 1 - \gamma_5)^{ll}, \\
& F_2(x, y; 1 + \gamma_5, 1 + \gamma_5)^{ll}, \\
& F_2(x, y; 1 - \gamma_5, 1 - \gamma_5)^{ll},
\end{aligned}$$

$F_{1,x}$ -type: 4 traces to be taken:

$$\begin{aligned}
& F_1(x; \Gamma_\mu^-)^l, \\
& F_1(x; \Gamma_\mu^-)^c, \\
& F_1(x; 1 + \gamma_5)^l, \\
& F_1(x; 1 - \gamma_5)^l,
\end{aligned}$$

$F_{1,y}$ -type: 4 traces to be taken:

$$\begin{aligned}
& F_1(y; \Gamma_\nu^-)^l, \\
& F_1(y; \Gamma_\nu^-)^c, \\
& F_1(y; 1 + \gamma_5)^l, \\
& F_1(y; 1 - \gamma_5)^l,
\end{aligned}$$