TO CORRECT: there is a missing Y_3 in the middle that must simply be adjoined to all terms, plus adding the ∂Y_3 terms to D_0.

Planar degenerate case

Consider again two indices $i < j$. We suppose WLOG $i < j$ with respect to the order of Γ, so that we can write $\Gamma = Y_1|X_1 i X_2|X_3 j X_4|Y_2$, with the usual convention for clouds of points. Then we have:

$$\begin{aligned} D_1^i D_2^{ij}(Y_1|X_1 i X_2|X_3 j X_4|Y_2) = {} & Y_1|X_1 i X_2|X_3(j+2)X_4|Y_2||Y_1|X_1(i+1)X_2|Y_2||Y_1|X_1(i+2)X_2|X_3(j+3)X_4|Y_2 \\ & + Y_1|X_1 i X_2|Y_2||Y_1|X_1(i+1)X_2|X_3(j+2)X_4|Y_2||Y_1|X_1(i+2)X_2|X_3(j+3)X_4|Y_2 \end{aligned}$$

$$D_2^{i,j+1} D_1^i(Y_1|X_1 i X_2|X_3 j X_4|Y_2) = Y_1|X_1 i X_2|X_3(j+2)X_4|Y_2||Y_1|X_1(i+1)X_2|X_3(j+3)X_4|Y_2||Y_1|X_1(i+2)X_2|Y_2$$

$$D_2^{i+1,j+1} D_1^i(Y_1|X_1 i X_2|X_3 j X_4|Y_2) = Y_1|X_1 i X_2|Y_2||Y_1|X_1(i+1)X_2|X_3(j+2)X_4|Y_2||Y_1|X_1(i+2)X_2|X_3(j+3)X_4|Y_2$$

$$\begin{aligned} D_1^{i+1} D_2^{ij}(Y_1|X_1 i X_2 j X_3|Y_2) = {} & Y_1|X_1 i X_2|X_3(j+2)X_4|Y_2||Y_1|X_1(i+1)X_2|Y_2||Y_1|X_1(i+2)X_2|X_3(j+3)X_4|Y_2 \\ & + Y_1|X_1 i X_2|X_3(j+2)X_4|Y_2||Y_1|X_1(i+1)X_2|X_3(j+3)X_4|Y_2||Y_1|X_1(i+2)X_2|Y_2 \end{aligned}$$