Aligned degenerate case

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

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

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

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

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