# Degree 2 for ${\mathcal A}^{sv}$

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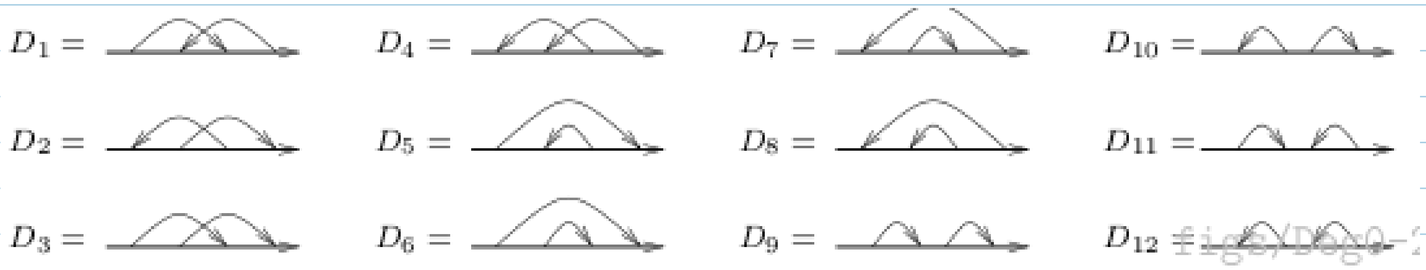
10:34 AM




line. The ordering $(ijk)$ becomes the relation $D_3 + D_9 + D_3 = D_6 + D_3 + D_6$. Likewise, $(ikj) \mapsto D_6 + D_1 + D_{11} = D_3 + D_5 + D_1$, $(jik) \mapsto D_{10} + D_2 + D_6 = D_2 + D_5 + D_3$, $(jki) \mapsto D_4 + D_7 + D_1 = D_8 + D_1 + D_{11}$, $(kij) \mapsto D_2 + D_7 + D_4 = D_{10} + D_2 + D_8$, and $(kji) \mapsto D_8 + D_4 + D_8 = D_4 + D_{12} + D_4$. After some linear algebra, we find that $\{D_1, D_2, D_6, D_8, D_9, D_{11}, D_{12}\}$ form a basis of $\mathcal{G}_2\mathcal{A}^v(\uparrow)$, and that the remaining diagrams reduce to the basis as follows: $D_3 = 2D_6 - D_9$, $D_4 = 2D_8 - D_{12}$, $D_5 = D_9 + D_{11} - D_6$, $D_7 = D_{11} + D_{12} - D_8$, and $D_{10} = D_{11}$. In $\mathcal{G}_2\mathcal{A}^{sv}(\uparrow)$ we have that $D_5 = D_6$, $D_7 = D_8$, and $D_9 = D_{10} = D_{11} = D_{12}$,

v basis: $\{1, 2, 6, 8, 9, 11, 12\}$

S relations:

$$D_9 + D_{11} - D_6 = D_6 \Rightarrow D_9 + D_{11} = 2D_6$$

$$D_{11} + D_{12} - D_8 = D_8 \Rightarrow D_{11} + D_{12} = 2D_8$$

$$D_9 = D_6 = D_8 = D_{11}$$

S basis: $\{1, 2, \overset{5}{\cancel{6}}, \cancel{11}\}$

$$D_3 = D_6 = D_5 = D_4 =$$