Degree 2

February-26-09
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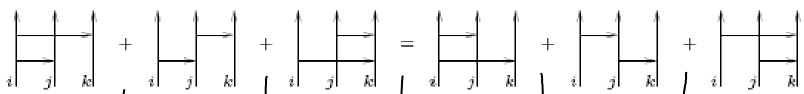
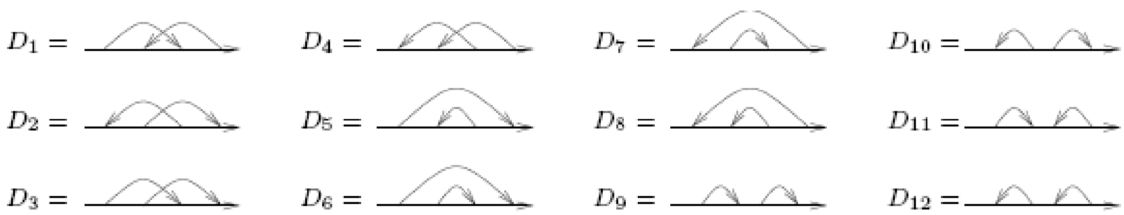


ijk	D_3	D_9	D_3	D_6	D_3	D_6
ikj	6	1	11	3	5	1
jik	10	2	6	2	5	3
jki	4	7	1	8	1	11
kij	2	7	4	10	2	8
kji	8	4	8	4	12	4



1342	2431	1324	3142	1432	1423	2341	3241	1234	2134	1243	2143
0	0	1	0	0	-2	0	0	1	0	0	0
0	0	-1	0	-1	1	0	0	0	0	1	0
0	0	-1	0	-1	1	0	0	0	1	0	0
0	0	0	1	0	0	1	-1	0	-1	0	0
0	0	0	1	0	0	1	-1	0	0	-1	0
0	0	0	-1	0	0	0	2	0	0	0	-1
1	2	3	4	5	6	7	8	9	10	11	12

See also
http://katlas.math.toronto.edu/drorbn/AcademicPensieve/2009-01/one/Degree_2_for_Virtual_Knots.pdf

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 $\mathcal{G}_2\mathcal{A}^-(\uparrow)$, and that the remaining diagrams reduce to the basis as follows: $D_3 = 2D_6 - D_9$, $D_4 = 2D_8 - D_{12}$, $D_5 = D_6 + D_{11} - D_8$, $D_7 = D_{11} + D_{12} - D_8$, and $D_{10} = D11$.

$D_9 + D_{11} - D_6$

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$D_3 = 2D_6 - D_9$

$D_3 = D_6 - D_{11} - D_5$ (same)

$D_4 = 2D_8 - D_{12}$

$D_3 = -D_5 + D_6 + D_1$

$D_4 = -D_7 + D_{11} + D_8$

~~$D_4 = -D_7 + D_{10} + D_8$~~

$D_4 = 2D_8 - D_{12}$ $\qquad 2D_8 - D_{12} = -D_7 + D_{11} + D_8$

$\Rightarrow D_7 = (11) + (12) - (8)$

$D_3 = 2D_6 - D_9 = -D_5 + D_6 + D_{11}$

$\Rightarrow D_5 = D_9 - D_6 + D_{11}$