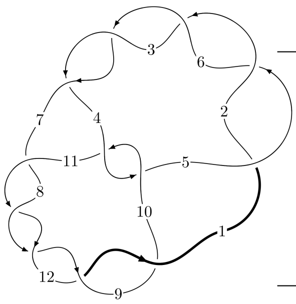
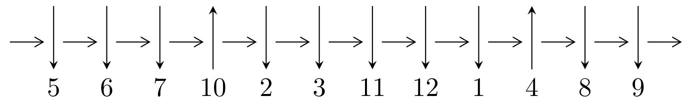
$12a_{1214}$ $(K12a_{1214})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$1,5 \xrightarrow[c_1]{} 2 \xrightarrow[c_5]{} 6 \xrightarrow[c_2]{} 3 \xrightarrow[c_6]{} 7,9 \xrightarrow[c_9]{} 10 \xrightarrow[c_4]{} 4 \xrightarrow[c_{12}]{} 12 \xrightarrow[c_8]{} 8 \xrightarrow[c_{11}]{} 11 \twoheadrightarrow c_3, c_7, c_{10}$$

Ideals for irreducible components[2] of $X_{\mathbf{par}}$

$$
\begin{aligned}
I_1^u &= \langle b+u,\ -u^6+5u^4+u^3-6u^2+a-2u,\ u^7-6u^5-u^4+10u^3+3u^2-3u+1\rangle \\
I_2^u &= \langle u^{17}-u^{16}+\cdots+b+1,\ u^{17}-3u^{16}+\cdots+a+5,\ u^{18}-2u^{17}+\cdots+5u+1\rangle \\
I_3^u &= \langle b+u,\ a+u,\ u^2+u-1\rangle \\
I_4^u &= \langle b-u-1,\ a-u-1,\ u^2+u-1\rangle \\
I_5^u &= \langle b+1,\ a+2,\ u-1\rangle
\end{aligned}
$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 representations.

[1]The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

[2]All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I.

$$\boldsymbol{I_1^u = \langle b+u,\ -u^6+5u^4+u^3-6u^2+a-2u,\ u^7-6u^5-u^4+10u^3+3u^2-3u+1\rangle}$$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ -u^3+u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^2+1 \\ -u^4+2u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^3-2u \\ u^5-3u^3+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^6-5u^4-u^3+6u^2+2u \\ -u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^6-5u^4-u^3+6u^2+3u \\ -u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^4-3u^2+1 \\ u^6-4u^4+3u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^5-4u^3-u^2+3u \\ -u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^4+3u^2+2u \\ u^3-u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^3+u^2+3u \\ u^4-2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^6+4u^5-12u^4-22u^3+18u^2+30u-18$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$u^7 - 6u^5 + u^4 + 10u^3 - 3u^2 - 3u - 1$
c_4, c_{10}	$u^7 - 4u^6 + 11u^5 - 19u^4 + 22u^3 - 20u^2 + 8u - 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$y^7 - 12y^6 + 56y^5 - 127y^4 + 142y^3 - 67y^2 + 3y - 1$
c_4, c_{10}	$y^7 + 6y^6 + 13y^5 - 21y^4 - 132y^3 - 200y^2 - 96y - 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.149610 + 0.279986I$ $a = 1.12909 + 0.89438I$ $b = 1.149610 - 0.279986I$	$-9.53872 + 4.72092I$	$-18.8644 - 4.7284I$
$u = -1.149610 - 0.279986I$ $a = 1.12909 - 0.89438I$ $b = 1.149610 + 0.279986I$	$-9.53872 - 4.72092I$	$-18.8644 + 4.7284I$
$u = 0.256916 + 0.244395I$ $a = 0.658925 + 1.198610I$ $b = -0.256916 - 0.244395I$	$-0.398617 - 0.781295I$	$-9.36937 + 8.81210I$
$u = 0.256916 - 0.244395I$ $a = 0.658925 - 1.198610I$ $b = -0.256916 + 0.244395I$	$-0.398617 + 0.781295I$	$-9.36937 - 8.81210I$
$u = -1.78027$ $a = 2.70935$ $b = 1.78027$	13.9427	-18.6250
$u = 1.78282 + 0.11231I$ $a = -2.14269 + 0.85665I$ $b = -1.78282 - 0.11231I$	$8.72326 - 8.52438I$	$-19.4535 + 3.0874I$
$u = 1.78282 - 0.11231I$ $a = -2.14269 - 0.85665I$ $b = -1.78282 + 0.11231I$	$8.72326 + 8.52438I$	$-19.4535 - 3.0874I$

II.

$$\boldsymbol{I^u_2 = \langle u^{17} - u^{16} + \cdots + b + 1,\ u^{17} - 3u^{16} + \cdots + a + 5,\ u^{18} - 2u^{17} + \cdots + 5u + 1\rangle}$$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u^3 - 2u \\ u^5 - 3u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^{17} + 3u^{16} + \cdots - 3u - 5 \\ -u^{17} + u^{16} + \cdots + 2u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 2u^{16} - u^{15} + \cdots - 5u - 4 \\ -u^{17} + u^{16} + \cdots + 2u - 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^4 - 3u^2 + 1 \\ u^6 - 4u^4 + 3u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^{16} + u^{15} + \cdots + 8u + 1 \\ -u^{16} + u^{15} + \cdots + 5u + 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^{10} + 7u^8 - 16u^6 + 2u^5 + 13u^4 - 8u^3 - 3u^2 + 6u - 1 \\ -u^{16} + u^{15} + \cdots + 4u + 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -2u^{17} + 2u^{16} + \cdots + 4u - 3 \\ -2u^{17} + u^{16} + \cdots + 2u - 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 3u^{16} - 3u^{15} - 28u^{14} + 27u^{13} + 96u^{12} - 99u^{11} - 137u^{10} + 200u^9 + 34u^8 - 233u^7 + 113u^6 + 107u^5 - 118u^4 + 26u^3 + 38u^2 - 18u - 11$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$u^{18} + 2u^{17} + \cdots - 5u + 1$
c_4, c_{10}	$(u^9 + 2u^8 + 7u^7 + 10u^6 + 15u^5 + 16u^4 + 8u^3 + 6u^2 - 3u - 2)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$y^{18} - 24y^{17} + \cdots - 39y + 1$
c_4, c_{10}	$(y^9 + 10y^8 + 39y^7 + 62y^6 - 13y^5 - 170y^4 - 178y^3 - 20y^2 + 33y - 4)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.099080 + 0.090870I$ $a = -0.384578 - 0.484468I$ $b = -0.375602 + 0.561098I$	$-4.71196 + 1.85169I$	$-15.8408 - 4.0347I$
$u = -1.099080 - 0.090870I$ $a = -0.384578 + 0.484468I$ $b = -0.375602 - 0.561098I$	$-4.71196 - 1.85169I$	$-15.8408 + 4.0347I$
$u = 0.404211 + 0.717214I$ $a = -0.242512 + 1.041630I$ $b = -1.76042 - 0.02141I$	$-15.1195 - 2.3160I$	$-16.2080 + 2.7069I$
$u = 0.404211 - 0.717214I$ $a = -0.242512 - 1.041630I$ $b = -1.76042 + 0.02141I$	$-15.1195 + 2.3160I$	$-16.2080 - 2.7069I$
$u = 1.18349$ $a = 2.74140$ $b = 1.71775$	-14.6766	-17.6580
$u = -1.187490 + 0.413479I$ $a = -1.70401 - 1.25443I$ $b = -1.77073 + 0.06860I$	$19.3766 + 6.2041I$	$-18.9481 - 3.7555I$
$u = -1.187490 - 0.413479I$ $a = -1.70401 + 1.25443I$ $b = -1.77073 - 0.06860I$	$19.3766 - 6.2041I$	$-18.9481 + 3.7555I$
$u = 0.703192$ $a = 0.770486$ $b = 0.187582$	-1.23204	-6.62220
$u = 0.375602 + 0.561098I$ $a = -0.227816 - 0.984272I$ $b = 1.099080 + 0.090870I$	$-4.71196 - 1.85169I$	$-15.8408 + 4.0347I$
$u = 0.375602 - 0.561098I$ $a = -0.227816 + 0.984272I$ $b = 1.099080 - 0.090870I$	$-4.71196 + 1.85169I$	$-15.8408 - 4.0347I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.394111$ $a = 2.82610$ $b = 1.63604$	-9.50074	-2.72570
$u = -1.63604$ $a = 0.680788$ $b = 0.394111$	-9.50074	-2.72570
$u = -1.71775$ $a = -1.88877$ $b = -1.18349$	-14.6766	-17.6580
$u = 1.76042 + 0.02141I$ $a = -0.478278 + 0.146184I$ $b = -0.404211 - 0.717214I$	$-15.1195 - 2.3160I$	$-16.2080 + 2.7069I$
$u = 1.76042 - 0.02141I$ $a = -0.478278 - 0.146184I$ $b = -0.404211 + 0.717214I$	$-15.1195 + 2.3160I$	$-16.2080 - 2.7069I$
$u = 1.77073 + 0.06860I$ $a = 1.41636 - 0.49822I$ $b = 1.187490 + 0.413479I$	$19.3766 - 6.2041I$	$-18.9481 + 3.7555I$
$u = 1.77073 - 0.06860I$ $a = 1.41636 + 0.49822I$ $b = 1.187490 - 0.413479I$	$19.3766 + 6.2041I$	$-18.9481 - 3.7555I$
$u = -0.187582$ $a = -2.88834$ $b = -0.703192$	-1.23204	-6.62220

III. $I_3^u = \langle b+u,\ a+u,\ u^2+u-1\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u+1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u+1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u \\ u-1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ u-1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -20$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_7, c_8, c_9	$u^2 + u - 1$
c_4, c_{10}	u^2
c_5, c_6, c_{11} c_{12}	$u^2 - u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$y^2 - 3y + 1$
c_4, c_{10}	y^2

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = -0.618034$ $b = -0.618034$	-1.97392	-20.0000
$u = -1.61803$ $a = 1.61803$ $b = 1.61803$	-17.7653	-20.0000

IV. $I_4^u = \langle b - u - 1,\ a - u - 1,\ u^2 + u - 1 \rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u+1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u+1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u+1 \\ u+1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ u+1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u-1 \\ -u-2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ -u-2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u+1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -25$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_7, c_8, c_9	$u^2 + u - 1$
c_4, c_{10}	u^2
c_5, c_6, c_{11} c_{12}	$u^2 - u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$y^2 - 3y + 1$
c_4, c_{10}	y^2

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = 1.61803$ $b = 1.61803$	-9.86960	-25.0000
$u = -1.61803$ $a = -0.618034$ $b = -0.618034$	-9.86960	-25.0000

V. $I_5^u = \langle b+1,\ a+2,\ u-1 \rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -2 \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -2 \\ -1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -18$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$u + 1$
c_4, c_{10}	$u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_4, c_5, c_6 c_7, c_8, c_9 c_{10}, c_{11}, c_{12}	$y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -2.00000$ $b = -1.00000$	-4.93480	-18.0000

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_7, c_8, c_9	$(u+1)(u^2+u-1)^2(u^7-6u^5+u^4+10u^3-3u^2-3u-1)$ $\cdot(u^{18}+2u^{17}+\cdots-5u+1)$
c_4, c_{10}	$u^4(u-1)(u^7-4u^6+11u^5-19u^4+22u^3-20u^2+8u-4)$ $\cdot(u^9+2u^8+7u^7+10u^6+15u^5+16u^4+8u^3+6u^2-3u-2)^2$
c_5, c_6, c_{11} c_{12}	$(u+1)(u^2-u-1)^2(u^7-6u^5+u^4+10u^3-3u^2-3u-1)$ $\cdot(u^{18}+2u^{17}+\cdots-5u+1)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$(y-1)(y^2-3y+1)^2$ $\cdot (y^7 - 12y^6 + 56y^5 - 127y^4 + 142y^3 - 67y^2 + 3y - 1)$ $\cdot (y^{18} - 24y^{17} + \cdots - 39y + 1)$
c_4, c_{10}	$y^4(y-1)(y^7 + 6y^6 + 13y^5 - 21y^4 - 132y^3 - 200y^2 - 96y - 16)$ $\cdot (y^9 + 10y^8 + 39y^7 + 62y^6 - 13y^5 - 170y^4 - 178y^3 - 20y^2 + 33y - 4)^2$