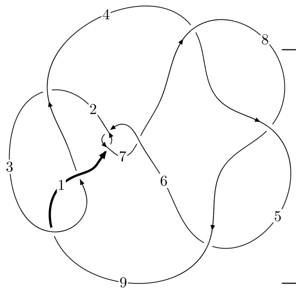
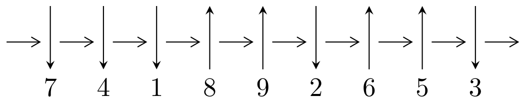
9_{24} $(K9a_7)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 2u^{16} + 2u^{15} + \cdots + 4b - 2,\ -2u^{16} - 3u^{15} + \cdots + 4a - 2,\ u^{17} + 2u^{16} + \cdots - 2u - 2\rangle$$
$$I_2^u = \langle a^2u - a^2 + b + 2a - 2,\ a^3 - 2a^2u + 3au - u,\ u^2 - u + 1\rangle$$

$$I_1^v = \langle a,\ b - 1,\ v - 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 24 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. $I^u_1 = \langle 2u^{16}+2u^{15}+\cdots+4b-2,\ -2u^{16}-3u^{15}+\cdots+4a-2,\ u^{17}+2u^{16}+\cdots-2u-2\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}\frac{1}{2}u^{16}+\frac{3}{4}u^{15}+\cdots-\frac{1}{2}u+\frac{1}{2}\\-\frac{1}{2}u^{16}-\frac{1}{2}u^{15}+\cdots+u+\frac{1}{2}\end{pmatrix}$$
$$a_3 = \begin{pmatrix}\frac{1}{4}u^{15}+\frac{1}{2}u^{13}+\cdots+\frac{1}{2}u+1\\-\frac{1}{2}u^{16}-\frac{1}{2}u^{15}+\cdots+u+\frac{1}{2}\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^3\\u^5+u^3+u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}\frac{1}{2}u^{16}+u^{15}+\cdots-u-\frac{1}{2}\\\frac{1}{4}u^{15}+\frac{1}{4}u^{14}+\cdots-\frac{1}{2}u-1\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-\frac{1}{4}u^{12}-\frac{1}{2}u^{10}+\cdots+\frac{1}{2}u+\frac{1}{2}\\\frac{1}{2}u^7+\frac{1}{2}u^5+\frac{3}{2}u^3+\frac{1}{2}u^2+u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-\frac{1}{4}u^{12}-\frac{1}{2}u^{10}+\cdots+\frac{1}{2}u+\frac{1}{2}\\\frac{1}{2}u^7+\frac{1}{2}u^5+\frac{3}{2}u^3+\frac{1}{2}u^2+u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^{16}+4u^{15}+6u^{14}+8u^{13}+8u^{12}+14u^{11}+10u^{10}+12u^9+4u^8+10u^7+20u^6+26u^5+16u^4-4u^3-10u^2-8u-4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^{17} - 2u^{16} + \cdots - 2u + 2$
c_2	$u^{17} + 8u^{16} + \cdots + 3u + 1$
c_3, c_9	$u^{17} - 2u^{16} + \cdots - u + 1$
c_4, c_5, c_8	$u^{17} + 2u^{16} + \cdots + 3u + 1$
c_7	$u^{17} - 6u^{16} + \cdots + 8u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{17} + 6y^{16} + \cdots + 8y - 4$
c_2	$y^{17} + 4y^{16} + \cdots - 13y - 1$
c_3, c_9	$y^{17} - 8y^{16} + \cdots + 3y - 1$
c_4, c_5, c_8	$y^{17} - 16y^{16} + \cdots + 19y - 1$
c_7	$y^{17} + 6y^{16} + \cdots + 376y - 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.742615 + 0.650908I$ $a = 0.456798 - 0.077068I$ $b = 1.128570 + 0.359117I$	$-3.65923 - 1.22724I$	$-6.14847 + 0.85505I$
$u = -0.742615 - 0.650908I$ $a = 0.456798 + 0.077068I$ $b = 1.128570 - 0.359117I$	$-3.65923 + 1.22724I$	$-6.14847 - 0.85505I$
$u = -0.834865 + 0.265014I$ $a = 0.636187 + 0.240948I$ $b = 0.374678 - 0.520641I$	$2.61956 - 0.43387I$	$2.56834 - 0.87540I$
$u = -0.834865 - 0.265014I$ $a = 0.636187 - 0.240948I$ $b = 0.374678 + 0.520641I$	$2.61956 + 0.43387I$	$2.56834 + 0.87540I$
$u = 0.976738 + 0.562668I$ $a = 0.456039 + 0.109653I$ $b = 1.072950 - 0.498433I$	$0.61043 + 4.64771I$	$-0.43915 - 4.11695I$
$u = 0.976738 - 0.562668I$ $a = 0.456039 - 0.109653I$ $b = 1.072950 + 0.498433I$	$0.61043 - 4.64771I$	$-0.43915 + 4.11695I$
$u = -0.003992 + 0.842342I$ $a = 1.18580 + 1.31498I$ $b = -0.621791 - 0.419413I$	$1.30982 - 1.46955I$	$3.63583 + 4.66528I$
$u = -0.003992 - 0.842342I$ $a = 1.18580 - 1.31498I$ $b = -0.621791 + 0.419413I$	$1.30982 + 1.46955I$	$3.63583 - 4.66528I$
$u = -0.656745 + 1.004700I$ $a = -0.46618 - 1.83030I$ $b = -1.130680 + 0.513073I$	$-2.57978 + 6.57063I$	$-3.26005 - 6.43452I$
$u = -0.656745 - 1.004700I$ $a = -0.46618 + 1.83030I$ $b = -1.130680 - 0.513073I$	$-2.57978 - 6.57063I$	$-3.26005 + 6.43452I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.110097 + 1.246510I$ $a = 0.360483 - 1.280850I$ $b = -0.796399 + 0.723427I$	$8.03468 + 2.71165I$	$5.84242 - 3.13710I$
$u = -0.110097 - 1.246510I$ $a = 0.360483 + 1.280850I$ $b = -0.796399 - 0.723427I$	$8.03468 - 2.71165I$	$5.84242 + 3.13710I$
$u = -0.578864 + 1.116300I$ $a = 0.568056 + 0.689908I$ $b = -0.288739 - 0.863831I$	$5.04981 + 5.51158I$	$4.25126 - 3.84490I$
$u = -0.578864 - 1.116300I$ $a = 0.568056 - 0.689908I$ $b = -0.288739 + 0.863831I$	$5.04981 - 5.51158I$	$4.25126 + 3.84490I$
$u = 0.718492 + 1.129370I$ $a = -0.46497 + 1.57649I$ $b = -1.172120 - 0.583556I$	$2.40324 - 10.83370I$	$0.89378 + 7.41261I$
$u = 0.718492 - 1.129370I$ $a = -0.46497 - 1.57649I$ $b = -1.172120 + 0.583556I$	$2.40324 + 10.83370I$	$0.89378 - 7.41261I$
$u = 0.463897$ $a = 0.535599$ $b = 0.867068$	-1.25812	-8.68790

II. $\boldsymbol{I_2^u = \langle a^2u - a^2 + b + 2a - 2,\ a^3 - 2a^2u + 3au - u,\ u^2 - u + 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u-1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a \\ -a^2u + a^2 - 2a + 2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -a^2u + a^2 - a + 2 \\ -a^2u + a^2 - 2a + 2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u \\ u-1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a^2u - a^2 + au + 2a - 2 \\ a^2u - a^2 + au + a - 2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -a^2u + a^2 - a + 2 \\ -a^2u + a^2 - 2a + 2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -a^2u + a^2 - a + 2 \\ -a^2u + a^2 - 2a + 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u^2 + u + 1)^3$
c_2	$u^6 + 4u^5 + 6u^4 + 3u^3 - u^2 - u + 1$
c_3, c_4, c_5 c_8, c_9	$u^6 - 2u^4 + u^3 + u^2 - u + 1$
c_7	$(u^2 - u + 1)^3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6, c_7	$(y^2+y+1)^3$
c_2	$y^6-4y^5+10y^4-11y^3+19y^2-3y+1$
c_3, c_4, c_5 c_8, c_9	$y^6-4y^5+6y^4-3y^3-y^2+y+1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.500000 + 0.866025I$ $a = 0.741145 - 0.632163I$ $b = -0.218964 + 0.666188I$	$-2.02988I$	$0. + 3.46410I$
$u = 0.500000 + 0.866025I$ $a = 0.439111 + 0.046276I$ $b = 1.252310 - 0.237364I$	$-2.02988I$	$0. + 3.46410I$
$u = 0.500000 + 0.866025I$ $a = -0.18026 + 2.31794I$ $b = -1.033350 - 0.428825I$	$-2.02988I$	$0. + 3.46410I$
$u = 0.500000 - 0.866025I$ $a = 0.741145 + 0.632163I$ $b = -0.218964 - 0.666188I$	$2.02988I$	$0. - 3.46410I$
$u = 0.500000 - 0.866025I$ $a = 0.439111 - 0.046276I$ $b = 1.252310 + 0.237364I$	$2.02988I$	$0. - 3.46410I$
$u = 0.500000 - 0.866025I$ $a = -0.18026 - 2.31794I$ $b = -1.033350 + 0.428825I$	$2.02988I$	$0. - 3.46410I$

III. $\boldsymbol{I_1^v = \langle a,\ b-1,\ v-1\rangle}$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_4 = \begin{pmatrix}0\\1\end{pmatrix}$$

$$a_3 = \begin{pmatrix}1\\1\end{pmatrix}$$

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_8 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_9 = \begin{pmatrix}0\\-1\end{pmatrix}$$

$$a_5 = \begin{pmatrix}1\\1\end{pmatrix}$$

$$a_5 = \begin{pmatrix}1\\1\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6, c_7	u
c_2, c_8, c_9	$u-1$
c_3, c_4, c_5	$u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6, c_7	y
c_2, c_3, c_4 c_5, c_8, c_9	$y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	1.00000		
$a =$	0	0	0
$b =$	1.00000		

IV. u-Polynomials

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

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y(y^2+y+1)^3(y^{17}+6y^{16}+\cdots+8y-4)$
c_2	$(y-1)(y^6-4y^5+10y^4-11y^3+19y^2-3y+1)$ $\cdot\,(y^{17}+4y^{16}+\cdots-13y-1)$
c_3, c_9	$(y-1)(y^6-4y^5+\cdots+y+1)(y^{17}-8y^{16}+\cdots+3y-1)$
c_4, c_5, c_8	$(y-1)(y^6-4y^5+\cdots+y+1)(y^{17}-16y^{16}+\cdots+19y-1)$
c_7	$y(y^2+y+1)^3(y^{17}+6y^{16}+\cdots+376y-16)$