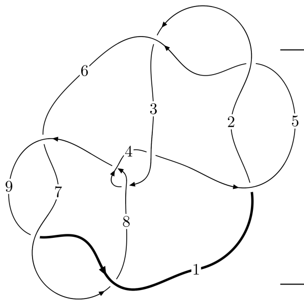
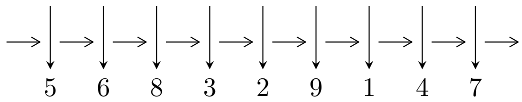
9_{16} $(K9a_{25})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u &= \langle b-u,\ u^6+u^5-3u^4-2u^3+2u^2+a-u+1,\ u^8+u^7-4u^6-3u^5+5u^4+u^3-u^2+3u-1\rangle \\
I_2^u &= \langle -u^{11}+4u^9-u^8-5u^7+3u^6+u^5-2u^4+u^3+b+u-1, \\
&\quad -u^{11}-u^{10}+4u^9+2u^8-7u^7+u^6+5u^5-5u^4+u^3+3u^2+a-2u, \\
&\quad u^{12}+u^{11}-4u^{10}-2u^9+7u^8-u^7-5u^6+5u^5-u^4-3u^3+2u^2+1\rangle \\
I_3^u &= \langle b+1,\ a+1,\ u-1\rangle
\end{aligned}
$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 21 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. $\boldsymbol{I_1^u = \langle b - u,\ u^6 + u^5 - 3u^4 - 2u^3 + 2u^2 + a - u + 1,\ u^8 + u^7 - 4u^6 - 3u^5 + 5u^4 + u^3 - u^2 + 3u - 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^6 - u^5 + 3u^4 + 2u^3 - 2u^2 + u - 1 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^6 - u^5 + 3u^4 + 2u^3 - 2u^2 - 1 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^5 - 2u^3 + u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^7 + u^6 - 3u^5 - 2u^4 + 2u^3 - u^2 + u + 1 \\ -u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^7 + u^6 - 3u^5 - 2u^4 + 2u^3 - u^2 + u + 1 \\ -u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2u^6 + 2u^5 + 10u^4 - 8u^3 - 12u^2 + 10u - 16$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7, c_9	$u^8 - u^7 - 4u^6 + 3u^5 + 5u^4 - u^3 - u^2 - 3u - 1$
c_3, c_8	$u^8 - 3u^7 + 3u^6 + 2u^5 - 8u^4 + 9u^3 - 3u^2 - 2u + 2$
c_4	$u^8 + 3u^7 + 5u^6 + 4u^5 + 2u^4 + 13u^3 + 13u^2 + 16u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7, c_9	$y^8 - 9y^7 + 32y^6 - 53y^5 + 31y^4 + 15y^3 - 15y^2 - 7y + 1$
c_3, c_8	$y^8 - 3y^7 + 5y^6 - 4y^5 + 2y^4 - 13y^3 + 13y^2 - 16y + 4$
c_4	$y^8 + y^7 + 5y^6 - 48y^5 - 58y^4 - 205y^3 - 231y^2 - 152y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.151337 + 0.673064I$ $a = -0.076017 - 0.952103I$ $b = 0.151337 + 0.673064I$	$1.48505 - 2.26376I$	$-5.94128 + 4.53378I$
$u = 0.151337 - 0.673064I$ $a = -0.076017 + 0.952103I$ $b = 0.151337 - 0.673064I$	$1.48505 + 2.26376I$	$-5.94128 - 4.53378I$
$u = 1.359440 + 0.207304I$ $a = 2.50827 - 1.24101I$ $b = 1.359440 + 0.207304I$	$-6.22518 - 3.55755I$	$-14.5274 + 2.6249I$
$u = 1.359440 - 0.207304I$ $a = 2.50827 + 1.24101I$ $b = 1.359440 - 0.207304I$	$-6.22518 + 3.55755I$	$-14.5274 - 2.6249I$
$u = -1.42757 + 0.33227I$ $a = -1.86256 - 1.18850I$ $b = -1.42757 + 0.33227I$	$-8.73978 + 9.88301I$	$-15.2825 - 6.0696I$
$u = -1.42757 - 0.33227I$ $a = -1.86256 + 1.18850I$ $b = -1.42757 - 0.33227I$	$-8.73978 - 9.88301I$	$-15.2825 + 6.0696I$
$u = -1.50912$ $a = -2.36273$ $b = -1.50912$	-13.4445	-18.3370
$u = 0.342714$ $a = -0.776649$ $b = 0.342714$	-0.719034	-14.1600

II.

$\boldsymbol{I_2^u = \langle -u^{11}+4u^9+\cdots+b-1,\ -u^{11}-u^{10}+\cdots+a-2u,\ u^{12}+u^{11}+\cdots+2u^2+1\rangle}$

(i) Arc colorings

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

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

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

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

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

$$a_7 = \begin{pmatrix} u^{11}+u^{10}-4u^9-2u^8+7u^7-u^6-5u^5+5u^4-u^3-3u^2+2u \\ u^{11}-4u^9+u^8+5u^7-3u^6-u^5+2u^4-u^3-u+1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^{10}-3u^8+2u^7+2u^6-4u^5+3u^4-3u^2+3u-1 \\ u^{11}-4u^9+u^8+5u^7-3u^6-u^5+2u^4-u^3-u+1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^5-2u^3+u \\ u^7-3u^5+2u^3+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^{11}+4u^9-2u^8-6u^7+6u^6+2u^5-6u^4+3u^3+2u^2-2u \\ -u^{11}+3u^9-2u^8-2u^7+4u^6-3u^5+3u^3-2u^2+u-2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^{11}+4u^9-2u^8-6u^7+6u^6+2u^5-6u^4+3u^3+2u^2-2u \\ -u^{11}+3u^9-2u^8-2u^7+4u^6-3u^5+3u^3-2u^2+u-2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^8+12u^6-4u^5-8u^4+8u^3-4u^2-10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7, c_9	$y^{12} - 9y^{11} + \cdots + 4y + 1$
c_3, c_8	$(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$
c_4	$(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.895235 + 0.524661I$ $a = -0.831450 + 0.487279I$ $b = -1.323480 + 0.139870I$	$-5.18047 + 0.92430I$	$-15.7167 - 0.7942I$
$u = 0.895235 - 0.524661I$ $a = -0.831450 - 0.487279I$ $b = -1.323480 - 0.139870I$	$-5.18047 - 0.92430I$	$-15.7167 + 0.7942I$
$u = 0.282166 + 0.828798I$ $a = -0.368111 + 1.081240I$ $b = -1.356120 - 0.270046I$	$-3.28987 - 5.69302I$	$-12.00000 + 5.51057I$
$u = 0.282166 - 0.828798I$ $a = -0.368111 - 1.081240I$ $b = -1.356120 + 0.270046I$	$-3.28987 + 5.69302I$	$-12.00000 - 5.51057I$
$u = 1.155020 + 0.191936I$ $a = -0.842520 + 0.140006I$ $b = -0.152828 - 0.487477I$	$-1.39926 - 0.92430I$	$-8.28328 + 0.79423I$
$u = 1.155020 - 0.191936I$ $a = -0.842520 - 0.140006I$ $b = -0.152828 + 0.487477I$	$-1.39926 + 0.92430I$	$-8.28328 - 0.79423I$
$u = -1.323480 + 0.139870I$ $a = 0.747239 + 0.078971I$ $b = 0.895235 + 0.524661I$	$-5.18047 + 0.92430I$	$-15.7167 - 0.7942I$
$u = -1.323480 - 0.139870I$ $a = 0.747239 - 0.078971I$ $b = 0.895235 - 0.524661I$	$-5.18047 - 0.92430I$	$-15.7167 + 0.7942I$
$u = -1.356120 + 0.270046I$ $a = 0.709275 + 0.141239I$ $b = 0.282166 - 0.828798I$	$-3.28987 + 5.69302I$	$-12.00000 - 5.51057I$
$u = -1.356120 - 0.270046I$ $a = 0.709275 - 0.141239I$ $b = 0.282166 + 0.828798I$	$-3.28987 - 5.69302I$	$-12.00000 + 5.51057I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.152828+0.487477I$ $a=\ 0.58557+1.86780I$ $b=\ 1.155020-0.191936I$	$-1.39926+0.92430I$	$-8.28328-0.79423I$
$u=-0.152828-0.487477I$ $a=\ 0.58557-1.86780I$ $b=\ 1.155020+0.191936I$	$-1.39926-0.92430I$	$-8.28328+0.79423I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.00000$ $b = -1.00000$	-3.28987	-12.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2, c_6 c_7	$(u-1)(u^8 - u^7 - 4u^6 + 3u^5 + 5u^4 - u^3 - u^2 - 3u - 1)$ $\cdot (u^{12} - u^{11} - 4u^{10} + 2u^9 + 7u^8 + u^7 - 5u^6 - 5u^5 - u^4 + 3u^3 + 2u^2 + 1)$
c_3, c_8	$u(u^6 + u^5 - u^4 - 2u^3 + u + 1)^2$ $\cdot (u^8 - 3u^7 + 3u^6 + 2u^5 - 8u^4 + 9u^3 - 3u^2 - 2u + 2)$
c_4	$u(u^6 + 3u^5 + 5u^4 + 4u^3 + 2u^2 + u + 1)^2$ $\cdot (u^8 + 3u^7 + 5u^6 + 4u^5 + 2u^4 + 13u^3 + 13u^2 + 16u + 4)$
c_5, c_9	$(u+1)(u^8 - u^7 - 4u^6 + 3u^5 + 5u^4 - u^3 - u^2 - 3u - 1)$ $\cdot (u^{12} - u^{11} - 4u^{10} + 2u^9 + 7u^8 + u^7 - 5u^6 - 5u^5 - u^4 + 3u^3 + 2u^2 + 1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7, c_9	$(y-1)(y^8 - 9y^7 + 32y^6 - 53y^5 + 31y^4 + 15y^3 - 15y^2 - 7y + 1)$ $\cdot (y^{12} - 9y^{11} + \cdots + 4y + 1)$
c_3, c_8	$y(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$ $\cdot (y^8 - 3y^7 + 5y^6 - 4y^5 + 2y^4 - 13y^3 + 13y^2 - 16y + 4)$
c_4	$y(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2$ $\cdot (y^8 + y^7 + 5y^6 - 48y^5 - 58y^4 - 205y^3 - 231y^2 - 152y + 16)$