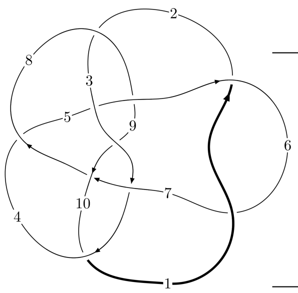
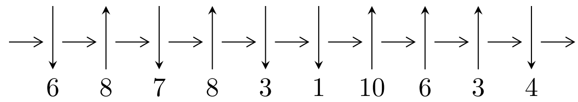
10_{164} $(K10n_{38})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle b+u,\ -138u^{11}+105u^{10}+\cdots+142a-155,\ u^{12}+u^9+6u^8+u^7-u^6+2u^5+5u^4-2u^3+2u+1\rangle\\
I_2^u &= \langle 22976741298u^{15}-77906464811u^{14}+\cdots+112332228513b+21004036137,\\
&\quad -2983129u^{15}+13995185u^{14}+\cdots+26682253a-65290273,\ u^{16}-3u^{15}+\cdots+4u+1\rangle\\
I_3^u &= \langle b+u,\ 3u^5+u^4+2u^3-3u^2+2a+6u+1,\ u^6+u^4-u^3+3u^2-u+1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 34 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. $\boldsymbol{I_1^u = \langle b+u,\ -138u^{11}+105u^{10}+\cdots+142a-155,\ u^{12}+u^9+\cdots+2u+1\rangle}$

(i) Arc colorings

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

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

$$a_1 = \begin{pmatrix} 0.971831u^{11} - 0.739437u^{10} + \cdots + 3.60563u + 1.09155 \\ -u \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 1.44718u^{11} - 0.0739437u^{10} + \cdots + 1.01056u + 3.60915 \\ -0.464789u^{11} + 0.0492958u^{10} + \cdots + 0.492958u - 0.739437 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.978873u^{11} + 0.0704225u^{10} + \cdots + 0.204225u + 2.94366 \\ -0.0669014u^{11} - 0.193662u^{10} + \cdots + 0.313380u - 0.595070 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.971831u^{11} - 0.739437u^{10} + \cdots + 2.60563u + 1.09155 \\ -u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.517606u^{11} + 0.0246479u^{10} + \cdots - 0.00352113u + 2.13028 \\ -0.464789u^{11} + 0.0492958u^{10} + \cdots + 0.492958u - 0.739437 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.0422535u^{11} + 0.359155u^{10} + \cdots - 0.408451u - 0.387324 \\ 0.468310u^{11} - 0.144366u^{10} + \cdots + 0.806338u + 0.665493 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.507042u^{11} - 0.690141u^{10} + \cdots + 3.09859u + 0.352113 \\ -0.169014u^{11} + 0.0633803u^{10} + \cdots - 1.36620u + 0.0492958 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{72}{71}u^{11}+\frac{169}{71}u^{10}-\frac{19}{71}u^9-\frac{56}{71}u^8-\frac{340}{71}u^7+\frac{943}{71}u^6+\frac{100}{71}u^5-\frac{288}{71}u^4-\frac{394}{71}u^3+\frac{984}{71}u^2-\frac{369}{71}u-\frac{192}{71}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^{12} + 8u^{11} + \cdots + 96u + 16$
c_2, c_8	$u^{12} - u^{11} + \cdots - 2u + 1$
c_3, c_{10}	$u^{12} - u^9 + 6u^8 - u^7 - u^6 - 2u^5 + 5u^4 + 2u^3 - 2u + 1$
c_4, c_9	$u^{12} - u^{11} + \cdots + 4u^2 + 2$
c_5	$u^{12} - 9u^{11} + \cdots - 20u + 16$
c_7	$u^{12} + 8u^{11} + \cdots + 22u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{12} + 6y^{11} + \cdots - 640y + 256$
c_2, c_8	$y^{12} + 17y^{11} + \cdots + 6y + 1$
c_3, c_{10}	$y^{12} + 12y^{10} + \cdots - 4y + 1$
c_4, c_9	$y^{12} + 5y^{11} + \cdots + 16y + 4$
c_5	$y^{12} - 11y^{11} + \cdots + 80y + 256$
c_7	$y^{12} + 2y^{11} + \cdots + 84y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.433167 + 0.820343I$ $a = 1.77573 - 0.27759I$ $b = -0.433167 - 0.820343I$	$-2.63922 - 4.58392I$	$1.89423 + 6.22117I$
$u = 0.433167 - 0.820343I$ $a = 1.77573 + 0.27759I$ $b = -0.433167 + 0.820343I$	$-2.63922 + 4.58392I$	$1.89423 - 6.22117I$
$u = -0.894529 + 0.606911I$ $a = -0.948486 - 0.965514I$ $b = 0.894529 - 0.606911I$	$-7.98844 + 5.04592I$	$-3.50212 - 4.93530I$
$u = -0.894529 - 0.606911I$ $a = -0.948486 + 0.965514I$ $b = 0.894529 + 0.606911I$	$-7.98844 - 5.04592I$	$-3.50212 + 4.93530I$
$u = 0.727666 + 0.459131I$ $a = 0.686537 - 0.236758I$ $b = -0.727666 - 0.459131I$	$-1.29616 - 0.86105I$	$-4.70470 + 1.78151I$
$u = 0.727666 - 0.459131I$ $a = 0.686537 + 0.236758I$ $b = -0.727666 + 0.459131I$	$-1.29616 + 0.86105I$	$-4.70470 - 1.78151I$
$u = -0.925706 + 1.050550I$ $a = -0.840738 + 0.491457I$ $b = 0.925706 - 1.050550I$	$3.38867 + 4.08003I$	$-1.46265 - 0.78652I$
$u = -0.925706 - 1.050550I$ $a = -0.840738 - 0.491457I$ $b = 0.925706 + 1.050550I$	$3.38867 - 4.08003I$	$-1.46265 + 0.78652I$
$u = -0.444254 + 0.260304I$ $a = -1.11367 + 2.11911I$ $b = 0.444254 - 0.260304I$	$1.58084 + 1.46904I$	$1.29817 - 5.01402I$
$u = -0.444254 - 0.260304I$ $a = -1.11367 - 2.11911I$ $b = 0.444254 + 0.260304I$	$1.58084 - 1.46904I$	$1.29817 + 5.01402I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.10366 + 1.16882I$ $a = 0.940626 + 0.241992I$ $b = -1.10366 - 1.16882I$	$-4.56023 - 12.50670I$	$-0.52291 + 6.78913I$
$u = 1.10366 - 1.16882I$ $a = 0.940626 - 0.241992I$ $b = -1.10366 + 1.16882I$	$-4.56023 + 12.50670I$	$-0.52291 - 6.78913I$

II.

$\boldsymbol{I_2^u = \langle 2.30\times10^{10}u^{15} - 7.79\times10^{10}u^{14} + \cdots + 1.12\times10^{10}b + 2.10\times10^{10},\ -2.98\times10^{6}u^{15} + 1.40\times10^{7}u^{14} + \cdots + 2.67\times10^{7}a - 6.53\times10^{7},\ u^{16} - 3u^{15} + \cdots + 4u + 1\rangle}$

(i) Arc colorings

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

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

$$a_1 = \begin{pmatrix}0.111802u^{15} - 0.524513u^{14} + \cdots - 0.695051u + 2.44696\\ -2.04543u^{15} + 6.93536u^{14} + \cdots - 10.9045u - 1.86981\end{pmatrix}$$

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

$$a_6 = \begin{pmatrix}0.888198u^{15} - 2.47549u^{14} + \cdots + 12.6951u + 1.55304\\ 1.45142u^{15} - 4.13944u^{14} + \cdots + 13.6179u + 4.66725\end{pmatrix}$$

$$a_5 = \begin{pmatrix}2.23464u^{15} - 6.47872u^{14} + \cdots + 24.6683u + 6.03118\\ 1.68993u^{15} - 4.95565u^{14} + \cdots + 15.1088u + 4.70335\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}-1.93362u^{15} + 6.41085u^{14} + \cdots - 11.5996u + 0.577142\\ -2.04543u^{15} + 6.93536u^{14} + \cdots - 10.9045u - 1.86981\end{pmatrix}$$

$$a_8 = \begin{pmatrix}2.50110u^{15} - 6.52849u^{14} + \cdots + 28.7759u + 8.29535\\ 0.161484u^{15} + 0.0864436u^{14} + \cdots + 4.46296u + 2.07506\end{pmatrix}$$

$$a_2 = \begin{pmatrix}-0.888198u^{15} + 2.47549u^{14} + \cdots - 12.6951u - 1.55304\\ -1.34644u^{15} + 4.00323u^{14} + \cdots - 11.9733u - 4.47814\end{pmatrix}$$

$$a_9 = \begin{pmatrix}0.0729519u^{15} - 0.441341u^{14} + \cdots - 0.188785u + 3.05693\\ -2.21877u^{15} + 7.30458u^{14} + \cdots - 12.2278u - 2.70227\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{627126322292}{11233228513}u^{15} + \frac{222551627880}{11233228513}u^{14} + \cdots - \frac{386527091664}{11233228513}u - \frac{36877222054}{11233228513}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u^2 - u + 1)^8$
c_2, c_8	$u^{16} + u^{15} + \cdots - 48u + 19$
c_3, c_{10}	$u^{16} + 3u^{15} + \cdots - 4u + 1$
c_4, c_9	$u^{16} + u^{15} + \cdots - 6u + 1$
c_5	$(u^4 + 3u^3 + u^2 - 2u + 1)^4$
c_7	$(u^4 - u^3 + u^2 + 1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^2 + y + 1)^8$
c_2, c_8	$y^{16} + 15y^{15} + \cdots + 2332y + 361$
c_3, c_{10}	$y^{16} + 3y^{15} + \cdots + 8y + 1$
c_4, c_9	$y^{16} + 7y^{15} + \cdots + 134y + 1$
c_5	$(y^4 - 7y^3 + 15y^2 - 2y + 1)^4$
c_7	$(y^4 + y^3 + 3y^2 + 2y + 1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.051690 + 0.235939I$ $a = -0.276759 + 0.885546I$ $b = 0.44895 - 1.60911I$	$-5.14581 + 0.61478I$	$-3.82674 + 1.44464I$
$u = 1.051690 - 0.235939I$ $a = -0.276759 - 0.885546I$ $b = 0.44895 + 1.60911I$	$-5.14581 - 0.61478I$	$-3.82674 - 1.44464I$
$u = -0.804589 + 0.808792I$ $a = 0.847270 - 0.224662I$ $b = -0.88699 + 1.31736I$	$1.85594 + 5.19385I$	$-0.17326 - 6.02890I$
$u = -0.804589 - 0.808792I$ $a = 0.847270 + 0.224662I$ $b = -0.88699 - 1.31736I$	$1.85594 - 5.19385I$	$-0.17326 + 6.02890I$
$u = -0.321200 + 0.647019I$ $a = -0.766065 + 1.153070I$ $b = 0.160429 + 0.464095I$	$1.85594 + 1.13408I$	$-0.173262 + 0.899303I$
$u = -0.321200 - 0.647019I$ $a = -0.766065 - 1.153070I$ $b = 0.160429 - 0.464095I$	$1.85594 - 1.13408I$	$-0.173262 - 0.899303I$
$u = -0.160429 + 0.464095I$ $a = 1.99954 + 0.38616I$ $b = 0.321200 + 0.647019I$	$1.85594 - 1.13408I$	$-0.173262 - 0.899303I$
$u = -0.160429 - 0.464095I$ $a = 1.99954 - 0.38616I$ $b = 0.321200 - 0.647019I$	$1.85594 + 1.13408I$	$-0.173262 + 0.899303I$
$u = -0.311042 + 0.310121I$ $a = 2.19827 - 0.59252I$ $b = -1.60753 - 1.13440I$	$-5.14581 + 3.44499I$	$-3.82674 - 8.37284I$
$u = -0.311042 - 0.310121I$ $a = 2.19827 + 0.59252I$ $b = -1.60753 + 1.13440I$	$-5.14581 - 3.44499I$	$-3.82674 + 8.37284I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.88699 + 1.31736I$ $a = -0.628172 - 0.043405I$ $b = 0.804589 + 0.808792I$	$1.85594 - 5.19385I$	$-0.17326 + 6.02890I$
$u = 0.88699 - 1.31736I$ $a = -0.628172 + 0.043405I$ $b = 0.804589 - 0.808792I$	$1.85594 + 5.19385I$	$-0.17326 - 6.02890I$
$u = -0.44895 + 1.60911I$ $a = 0.579766 + 0.148974I$ $b = -1.051690 - 0.235939I$	$-5.14581 + 0.61478I$	$-3.82674 + 1.44464I$
$u = -0.44895 - 1.60911I$ $a = 0.579766 - 0.148974I$ $b = -1.051690 + 0.235939I$	$-5.14581 - 0.61478I$	$-3.82674 - 1.44464I$
$u = 1.60753 + 1.13440I$ $a = 0.046151 + 0.506163I$ $b = 0.311042 - 0.310121I$	$-5.14581 + 3.44499I$	$-3.82674 - 8.37284I$
$u = 1.60753 - 1.13440I$ $a = 0.046151 - 0.506163I$ $b = 0.311042 + 0.310121I$	$-5.14581 - 3.44499I$	$-3.82674 + 8.37284I$

III.

$$I_3^u = \langle b+u,\ 3u^5+u^4+2u^3-3u^2+2a+6u+1,\ u^6+u^4-u^3+3u^2-u+1\rangle$$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 7u^5 + 5u^4 + 6u^3 - 3u^2 + 11u + 10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^6 + 5y^5 + 13y^4 + 21y^3 + 21y^2 + 12y + 4$
c_2, c_8	$y^6 + 3y^5 - 4y^3 + 8y^2 - 5y + 1$
c_3, c_{10}	$y^6 + 2y^5 + 7y^4 + 7y^3 + 9y^2 + 5y + 1$
c_4, c_9	$y^6 + 3y^5 + 6y^4 + y^2 - 8y + 4$
c_5	$y^6 - 4y^5 - 8y^4 + 26y^3 + 48y^2 + 4y + 1$
c_7	$y^6 + y^5 + 9y^4 + 3y^3 + 11y^2 + 2y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.747107 + 0.813589I$ $a = 0.239424 + 0.758194I$ $b = -0.747107 - 0.813589I$	$-4.92982 + 2.38212I$	$-1.44137 - 0.69060I$
$u = 0.747107 - 0.813589I$ $a = 0.239424 - 0.758194I$ $b = -0.747107 + 0.813589I$	$-4.92982 - 2.38212I$	$-1.44137 + 0.69060I$
$u = 0.125253 + 0.619808I$ $a = -1.46927 - 1.44270I$ $b = -0.125253 - 0.619808I$	$2.50509 - 1.44331I$	$12.78155 + 4.91052I$
$u = 0.125253 - 0.619808I$ $a = -1.46927 + 1.44270I$ $b = -0.125253 + 0.619808I$	$2.50509 + 1.44331I$	$12.78155 - 4.91052I$
$u = -0.87236 + 1.13524I$ $a = -0.770152 + 0.391132I$ $b = 0.87236 - 1.13524I$	$4.06966 + 4.74338I$	$5.65982 - 6.07362I$
$u = -0.87236 - 1.13524I$ $a = -0.770152 - 0.391132I$ $b = 0.87236 + 1.13524I$	$4.06966 - 4.74338I$	$5.65982 + 6.07362I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^8)(u^6-u^5+\cdots+3u^2+2)(u^{12}+8u^{11}+\cdots+96u+16)$
c_2, c_8	$(u^6-u^5+2u^4-2u^2+u+1)(u^{12}-u^{11}+\cdots-2u+1)$ $\cdot(u^{16}+u^{15}+\cdots-48u+19)$
c_3, c_{10}	$(u^6+u^4-u^3+3u^2-u+1)$ $\cdot(u^{12}-u^9+6u^8-u^7-u^6-2u^5+5u^4+2u^3-2u+1)$ $\cdot(u^{16}+3u^{15}+\cdots-4u+1)$
c_4, c_9	$(u^6-u^5+2u^4+2u^3-u^2+2u+2)(u^{12}-u^{11}+\cdots+4u^2+2)$ $\cdot(u^{16}+u^{15}+\cdots-6u+1)$
c_5	$(u^4+3u^3+u^2-2u+1)^4(u^6+4u^5+6u^4+8u^3+10u^2+4u+1)$ $\cdot(u^{12}-9u^{11}+\cdots-20u+16)$
c_6	$((u^2-u+1)^8)(u^6+u^5+\cdots+3u^2+2)(u^{12}+8u^{11}+\cdots+96u+16)$
c_7	$(u^4-u^3+u^2+1)^4(u^6+3u^5+5u^4+3u^3+u^2+1)$ $\cdot(u^{12}+8u^{11}+\cdots+22u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^2+y+1)^8(y^6+5y^5+13y^4+21y^3+21y^2+12y+4)$ $\cdot(y^{12}+6y^{11}+\cdots-640y+256)$
c_2, c_8	$(y^6+3y^5-4y^3+8y^2-5y+1)(y^{12}+17y^{11}+\cdots+6y+1)$ $\cdot(y^{16}+15y^{15}+\cdots+2332y+361)$
c_3, c_{10}	$(y^6+2y^5+\cdots+5y+1)(y^{12}+12y^{10}+\cdots-4y+1)$ $\cdot(y^{16}+3y^{15}+\cdots+8y+1)$
c_4, c_9	$(y^6+3y^5+6y^4+y^2-8y+4)(y^{12}+5y^{11}+\cdots+16y+4)$ $\cdot(y^{16}+7y^{15}+\cdots+134y+1)$
c_5	$((y^4-7y^3+15y^2-2y+1)^4)(y^6-4y^5+\cdots+4y+1)$ $\cdot(y^{12}-11y^{11}+\cdots+80y+256)$
c_7	$(y^4+y^3+3y^2+2y+1)^4(y^6+y^5+9y^4+3y^3+11y^2+2y+1)$ $\cdot(y^{12}+2y^{11}+\cdots+84y+16)$