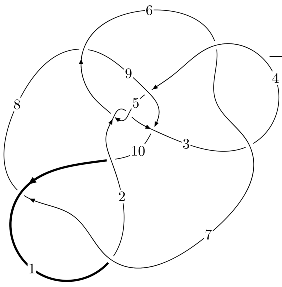
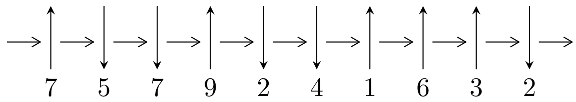
10_{146} $(K10n_{23})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u &= \langle -469u^9 + 1285u^8 + \cdots + 1534b + 422,\ -469u^9 + 1285u^8 + \cdots + 3068a - 1879, \\
&\quad u^{10} - 3u^9 + 9u^8 - 16u^7 + 24u^6 - 25u^5 + 21u^4 - 4u^3 - 3u^2 + 3u + 4 \rangle \\
I_2^u &= \langle b + 1,\ 3u^4 - 2u^3 + a^2 + 11u^2 - a - 5u + 7,\ u^5 - u^4 + 4u^3 - 3u^2 + 3u - 1 \rangle \\
I_3^u &= \langle -au + b + a + 1,\ a^2 - u,\ u^2 - u + 1 \rangle
\end{aligned}
$$

* 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. $\boldsymbol{I_1^u = \langle -469u^9 + 1285u^8 + \cdots + 1534b + 422,\ -469u^9 + 1285u^8 + \cdots + 3068a - 1879,\ u^{10} - 3u^9 + \cdots + 3u + 4\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.152868u^9 - 0.418840u^8 + \cdots + 0.480769u + 0.612451 \\ 0.305737u^9 - 0.837679u^8 + \cdots - 1.03846u - 0.275098 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.152868u^9 - 0.418840u^8 + \cdots + 0.480769u + 0.612451 \\ 0.140808u^9 - 0.379400u^8 + \cdots - 0.307692u - 0.116037 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0290091u^9 + 0.0537810u^8 + \cdots - 0.711538u - 0.220665 \\ 0.0397653u^9 + 0.0456323u^8 + \cdots + 0.153846u - 0.611473 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.0687744u^9 + 0.0994133u^8 + \cdots - 0.557692u - 0.832138 \\ 0.0397653u^9 + 0.0456323u^8 + \cdots + 0.153846u - 0.611473 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.0602999u^9 + 0.197197u^8 + \cdots + 1.05769u + 0.857562 \\ 0.0162973u^9 + 0.108866u^8 + \cdots + 1.03846u + 0.241199 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{171}{767}u^9 - \frac{269}{767}u^8 + \frac{1052}{767}u^7 - \frac{1818}{767}u^6 + \frac{2398}{767}u^5 - \frac{4011}{767}u^4 + \frac{2685}{767}u^3 - \frac{3379}{767}u^2 + \frac{37}{13}u - \frac{2378}{767}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$u^{10} - 3u^9 + 9u^8 - 16u^7 + 24u^6 - 25u^5 + 21u^4 - 4u^3 - 3u^2 + 3u + 4$
c_2, c_3, c_5 c_6	$u^{10} + u^8 + u^7 + 5u^6 + 2u^4 + 3u^3 + 2u^2 + 1$
c_4	$u^{10} - 3u^9 + 3u^8 + 2u^7 - 6u^6 + 3u^5 + 3u^4 - 4u^3 + 3u^2 - 3u + 2$
c_8, c_9	$u^{10} + 2u^9 + 9u^8 + 7u^7 + 30u^6 + 6u^5 + 41u^4 + 22u^2 + 4$
c_{10}	$u^{10} + 9u^9 + \cdots - 33u + 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y^{10} + 9y^9 + \cdots - 33y + 16$
c_2, c_3, c_5 c_6	$y^{10} + 2y^9 + 11y^8 + 13y^7 + 33y^6 + 20y^5 + 26y^4 + 9y^3 + 8y^2 + 4y + 1$
c_4	$y^{10} - 3y^9 + 9y^8 - 16y^7 + 24y^6 - 25y^5 + 21y^4 - 4y^3 - 3y^2 + 3y + 4$
c_8, c_9	$y^{10} + 14y^9 + \cdots + 176y + 16$
c_{10}	$y^{10} - 15y^9 + \cdots + 5343y + 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.741866 + 0.796341I$ $a = 0.500393 + 0.239842I$ $b = -0.625089 + 0.778917I$	$1.60483 + 1.51336I$	$1.256588 - 0.171947I$
$u = 0.741866 - 0.796341I$ $a = 0.500393 - 0.239842I$ $b = -0.625089 - 0.778917I$	$1.60483 - 1.51336I$	$1.256588 + 0.171947I$
$u = 1.077560 + 0.740596I$ $a = 0.030843 - 0.749210I$ $b = 0.94514 - 1.33248I$	$1.74604 + 4.90489I$	$2.53483 - 7.39457I$
$u = 1.077560 - 0.740596I$ $a = 0.030843 + 0.749210I$ $b = 0.94514 + 1.33248I$	$1.74604 - 4.90489I$	$2.53483 + 7.39457I$
$u = -0.429682 + 0.277960I$ $a = 0.69620 + 1.42291I$ $b = 0.722559 + 0.567039I$	$-1.23090 - 1.07704I$	$-4.33290 + 2.58024I$
$u = -0.429682 - 0.277960I$ $a = 0.69620 - 1.42291I$ $b = 0.722559 - 0.567039I$	$-1.23090 + 1.07704I$	$-4.33290 - 2.58024I$
$u = -0.25937 + 1.52583I$ $a = -0.571923 + 0.727637I$ $b = 1.66770 + 0.84950I$	$-7.19127 - 3.97850I$	$-1.38540 + 2.06163I$
$u = -0.25937 - 1.52583I$ $a = -0.571923 - 0.727637I$ $b = 1.66770 - 0.84950I$	$-7.19127 + 3.97850I$	$-1.38540 - 2.06163I$
$u = 0.36963 + 1.73551I$ $a = -0.530514 - 0.624791I$ $b = 1.78968 - 0.93001I$	$-6.44324 + 10.56100I$	$-0.07312 - 6.56398I$
$u = 0.36963 - 1.73551I$ $a = -0.530514 + 0.624791I$ $b = 1.78968 + 0.93001I$	$-6.44324 - 10.56100I$	$-0.07312 + 6.56398I$

II.

$$\boldsymbol{I_2^u = \langle b+1,\ 3u^4-2u^3+a^2+11u^2-a-5u+7,\ u^5-u^4+4u^3-3u^2+3u-1\rangle}$$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$(u^5 - u^4 + 4u^3 - 3u^2 + 3u - 1)^2$
c_2, c_3, c_5 c_6	$u^{10} - u^9 + 2u^8 - 2u^7 + 4u^6 - 4u^5 + 9u^4 - 7u^3 + 8u^2 - 4u + 1$
c_4	$(u^5 + u^4 - u^2 + u + 1)^2$
c_8, c_9	$u^{10} + u^9 + 2u^8 - 2u^7 + 6u^6 + 10u^5 + 11u^4 + 27u^3 + 6u^2 + 10u + 29$
c_{10}	$(u^5 + 7u^4 + 16u^3 + 13u^2 + 3u - 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$(y^5 + 7y^4 + 16y^3 + 13y^2 + 3y - 1)^2$
c_2, c_3, c_5 c_6	$y^{10} + 3y^9 + 8y^8 + 22y^7 + 38y^6 + 54y^5 + 77y^4 + 71y^3 + 26y^2 + 1$
c_4	$(y^5 - y^4 + 4y^3 - 3y^2 + 3y - 1)^2$
c_8, c_9	$y^{10} + 3y^9 + \cdots + 248y + 841$
c_{10}	$(y^5 - 17y^4 + 80y^3 - 59y^2 + 35y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.233677 + 0.885557I$ $a = 1.186080 + 0.428672I$ $b = -1.00000$	$1.47006 + 2.21397I$	$-0.88568 - 4.22289I$
$u = 0.233677 + 0.885557I$ $a = -0.186079 - 0.428672I$ $b = -1.00000$	$1.47006 + 2.21397I$	$-0.88568 - 4.22289I$
$u = 0.233677 - 0.885557I$ $a = 1.186080 - 0.428672I$ $b = -1.00000$	$1.47006 - 2.21397I$	$-0.88568 + 4.22289I$
$u = 0.233677 - 0.885557I$ $a = -0.186079 + 0.428672I$ $b = -1.00000$	$1.47006 - 2.21397I$	$-0.88568 + 4.22289I$
$u = 0.416284$ $a = 0.50000 + 2.55355I$ $b = -1.00000$	4.17205	7.60880
$u = 0.416284$ $a = 0.50000 - 2.55355I$ $b = -1.00000$	4.17205	7.60880
$u = 0.05818 + 1.69128I$ $a = 0.518923 + 0.634033I$ $b = -1.00000$	$-7.66842 + 3.33174I$	$-1.91874 - 2.36228I$
$u = 0.05818 + 1.69128I$ $a = 0.481077 - 0.634033I$ $b = -1.00000$	$-7.66842 + 3.33174I$	$-1.91874 - 2.36228I$
$u = 0.05818 - 1.69128I$ $a = 0.518923 - 0.634033I$ $b = -1.00000$	$-7.66842 - 3.33174I$	$-1.91874 + 2.36228I$
$u = 0.05818 - 1.69128I$ $a = 0.481077 + 0.634033I$ $b = -1.00000$	$-7.66842 - 3.33174I$	$-1.91874 + 2.36228I$

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

(i) Arc colorings

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

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

$$a_1 = \begin{pmatrix} 1 \\ u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} a \\ au - a - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u \\ u - 1 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} u - 1 \\ -au \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -au + u - 1 \\ -au \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -au + u + 1 \\ au - a + 2u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u + 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7, c_{10}	$(y^2+y+1)^2$
c_2, c_3, c_5 c_6	$(y+1)^4$
c_4	$(y^2-y+1)^2$
c_8, c_9	y^4-4y^2+16

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.500000 + 0.866025I$ $a = 0.866025 + 0.500000I$ $b = -1.86603 + 0.50000I$	$3.28987 + 2.02988I$	$6.00000 - 3.46410I$
$u = 0.500000 + 0.866025I$ $a = -0.866025 - 0.500000I$ $b = -0.133975 - 0.500000I$	$3.28987 + 2.02988I$	$6.00000 - 3.46410I$
$u = 0.500000 - 0.866025I$ $a = 0.866025 - 0.500000I$ $b = -1.86603 - 0.50000I$	$3.28987 - 2.02988I$	$6.00000 + 3.46410I$
$u = 0.500000 - 0.866025I$ $a = -0.866025 + 0.500000I$ $b = -0.133975 + 0.500000I$	$3.28987 - 2.02988I$	$6.00000 + 3.46410I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)^2(u^5-u^4+4u^3-3u^2+3u-1)^2$ $\cdot(u^{10}-3u^9+9u^8-16u^7+24u^6-25u^5+21u^4-4u^3-3u^2+3u+4)$
c_2, c_3, c_5 c_6	$(u^2+1)^2(u^{10}+u^8+u^7+5u^6+2u^4+3u^3+2u^2+1)$ $\cdot(u^{10}-u^9+2u^8-2u^7+4u^6-4u^5+9u^4-7u^3+8u^2-4u+1)$
c_4	$(u^4-u^2+1)(u^5+u^4-u^2+u+1)^2$ $\cdot(u^{10}-3u^9+3u^8+2u^7-6u^6+3u^5+3u^4-4u^3+3u^2-3u+2)$
c_7	$(u^2+u+1)^2(u^5-u^4+4u^3-3u^2+3u-1)^2$ $\cdot(u^{10}-3u^9+9u^8-16u^7+24u^6-25u^5+21u^4-4u^3-3u^2+3u+4)$
c_8	$(u^4-2u^3+2u^2-4u+4)$ $\cdot(u^{10}+u^9+2u^8-2u^7+6u^6+10u^5+11u^4+27u^3+6u^2+10u+29)$ $\cdot(u^{10}+2u^9+9u^8+7u^7+30u^6+6u^5+41u^4+22u^2+4)$
c_9	$(u^4+2u^3+2u^2+4u+4)$ $\cdot(u^{10}+u^9+2u^8-2u^7+6u^6+10u^5+11u^4+27u^3+6u^2+10u+29)$ $\cdot(u^{10}+2u^9+9u^8+7u^7+30u^6+6u^5+41u^4+22u^2+4)$
c_{10}	$(u^2-u+1)^2(u^5+7u^4+16u^3+13u^2+3u-1)^2$ $\cdot(u^{10}+9u^9+\cdots-33u+16)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_7	$(y^2+y+1)^2(y^5+7y^4+16y^3+13y^2+3y-1)^2$ $\cdot\,(y^{10}+9y^9+\cdots-33y+16)$
c_2, c_3, c_5 c_6	$(y+1)^4$ $\cdot\,(y^{10}+2y^9+11y^8+13y^7+33y^6+20y^5+26y^4+9y^3+8y^2+4y+1)$ $\cdot\,(y^{10}+3y^9+8y^8+22y^7+38y^6+54y^5+77y^4+71y^3+26y^2+1)$
c_4	$(y^2-y+1)^2(y^5-y^4+4y^3-3y^2+3y-1)^2$ $\cdot\,(y^{10}-3y^9+9y^8-16y^7+24y^6-25y^5+21y^4-4y^3-3y^2+3y+4)$
c_8, c_9	$(y^4-4y^2+16)(y^{10}+3y^9+\cdots+248y+841)$ $\cdot\,(y^{10}+14y^9+\cdots+176y+16)$
c_{10}	$(y^2+y+1)^2(y^5-17y^4+80y^3-59y^2+35y-1)^2$ $\cdot\,(y^{10}-15y^9+\cdots+5343y+256)$