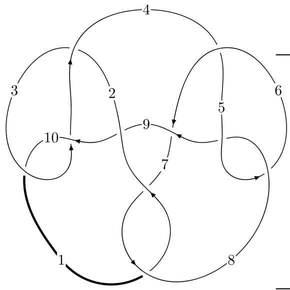
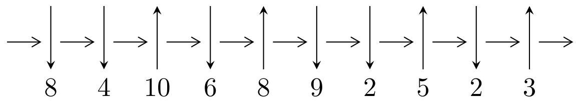
10_{138} $(K10n_1)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

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

$$\begin{aligned} I_2^u = \langle\, & u^{13} - 2u^{12} + 6u^{11} - 7u^{10} + 11u^9 - 13u^8 + 14u^7 - 17u^6 + 10u^5 - 9u^4 + 7u^3 - 3u^2 + b + 3u, \\ & -u^{12} + 2u^{11} - 5u^{10} + 6u^9 - 9u^8 + 11u^7 - 12u^6 + 13u^5 - 8u^4 + 8u^3 - 5u^2 + a + 3u - 2, \\ & u^{14} - 2u^{13} + 6u^{12} - 8u^{11} + 13u^{10} - 16u^9 + 18u^8 - 21u^7 + 16u^6 - 15u^5 + 10u^4 - 6u^3 + 5u^2 - u + 1 \rangle \end{aligned}$$

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

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

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 25 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. $\boldsymbol{I^u_1 = \langle -u^4+u^3-u^2+b+u,\ -u^4+u^3-2u^2+a+u-1,\ u^7-u^6+3u^5-2u^4+3u^3-2u^2-1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}u^4-u^3+2u^2-u+1\\u^4-u^3+u^2-u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u^2-1\\u^5+2u^3-u^2+u-1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^4-u^3+2u^2-u+1\\-u^6+u^5-u^4-u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}u^2+1\\-u^4\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^3+u^2-u+1\\u^6+u^4-u^3+u^2-u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u^4+u^2+1\\u^4\end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$u^7 + 5u^6 + 10u^5 + 13u^4 + 18u^3 + 20u^2 + 12u + 4$
c_2, c_4	$u^7 + 5u^6 + 11u^5 + 10u^4 - u^3 - 8u^2 - 4u - 1$
c_3, c_5, c_8 c_{10}	$u^7 + u^6 + 3u^5 + 2u^4 + 3u^3 + 2u^2 + 1$
c_6, c_9	$u^7 - u^6 - 5u^5 + 2u^4 + 7u^3 + 4u^2 + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y^7 - 5y^6 + 6y^5 + 15y^4 + 4y^3 - 72y^2 - 16y - 16$
c_2, c_4	$y^7 - 3y^6 + 19y^5 - 50y^4 + 83y^3 - 36y^2 - 1$
c_3, c_5, c_8 c_{10}	$y^7 + 5y^6 + 11y^5 + 10y^4 - y^3 - 8y^2 - 4y - 1$
c_6, c_9	$y^7 - 11y^6 + 43y^5 - 62y^4 + 15y^3 + 8y^2 - 4y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.903382$ $a = 1.65758$ $b = -0.158515$	-3.61413	-1.15360
$u = -0.237163 + 1.166790I$ $a = -0.931299 + 0.562572I$ $b = -0.626141 + 1.116010I$	$-4.21141 - 3.35522I$	$-7.88053 + 3.75965I$
$u = -0.237163 - 1.166790I$ $a = -0.931299 - 0.562572I$ $b = -0.626141 - 1.116010I$	$-4.21141 + 3.35522I$	$-7.88053 - 3.75965I$
$u = -0.266839 + 0.572668I$ $a = 0.482335 - 0.961495I$ $b = -0.260920 - 0.655876I$	$-0.184850 - 1.357360I$	$-2.08591 + 4.58406I$
$u = -0.266839 - 0.572668I$ $a = 0.482335 + 0.961495I$ $b = -0.260920 + 0.655876I$	$-0.184850 + 1.357360I$	$-2.08591 - 4.58406I$
$u = 0.552311 + 1.284990I$ $a = 0.120172 - 1.321830I$ $b = 0.46632 - 2.74126I$	$-11.0685 + 10.4672I$	$-6.45679 - 5.97165I$
$u = 0.552311 - 1.284990I$ $a = 0.120172 + 1.321830I$ $b = 0.46632 + 2.74126I$	$-11.0685 - 10.4672I$	$-6.45679 + 5.97165I$

II.

$$\boldsymbol{I^u_2 = \langle u^{13}-2u^{12}+\cdots+b+3u,\ -u^{12}+2u^{11}+\cdots+a-2,\ u^{14}-2u^{13}+\cdots-u+1\rangle}$$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= 5u^{13}-8u^{12}+25u^{11}-27u^{10}+45u^9-53u^8+56u^7-68u^6+41u^5-40u^4+30u^3-14u^2+15u-5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$(u^7 - 2u^6 - 3u^5 + 8u^4 - 2u^3 - 2u^2 - u + 2)^2$
c_2, c_4	$u^{14} + 8u^{13} + \cdots + 9u + 1$
c_3, c_5, c_8 c_{10}	$u^{14} + 2u^{13} + \cdots + u + 1$
c_6, c_9	$u^{14} - 2u^{13} + \cdots - 5u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$(y^7 - 10y^6 + 37y^5 - 62y^4 + 50y^3 - 32y^2 + 9y - 4)^2$
c_2, c_4	$y^{14} - 4y^{13} + \cdots - 15y + 1$
c_3, c_5, c_8 c_{10}	$y^{14} + 8y^{13} + \cdots + 9y + 1$
c_6, c_9	$y^{14} - 16y^{13} + \cdots + 9y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.991355 + 0.114136I$ $a = -1.71230 - 0.09769I$ $b = 0.026394 - 0.197164I$	$-7.46645 - 4.93043I$	$-4.23989 + 2.98386I$
$u = 0.991355 - 0.114136I$ $a = -1.71230 + 0.09769I$ $b = 0.026394 + 0.197164I$	$-7.46645 + 4.93043I$	$-4.23989 - 2.98386I$
$u = 0.185175 + 0.946853I$ $a = -0.600533 + 0.684269I$ $b = 0.46039 + 1.77594I$	$-1.11654 + 3.28492I$	$-6.60141 - 2.44171I$
$u = 0.185175 - 0.946853I$ $a = -0.600533 - 0.684269I$ $b = 0.46039 - 1.77594I$	$-1.11654 - 3.28492I$	$-6.60141 + 2.44171I$
$u = -0.625804 + 0.953838I$ $a = 0.688899 + 0.343864I$ $b = 0.684697 + 0.025265I$	$-1.11654 - 3.28492I$	$-6.60141 + 2.44171I$
$u = -0.625804 - 0.953838I$ $a = 0.688899 - 0.343864I$ $b = 0.684697 - 0.025265I$	$-1.11654 + 3.28492I$	$-6.60141 - 2.44171I$
$u = -0.457566 + 0.656399I$ $a = 0.143355 - 0.834966I$ $b = -0.251357 - 0.560891I$	$-0.165382 - 1.372840I$	$-2.77344 + 4.48022I$
$u = -0.457566 - 0.656399I$ $a = 0.143355 + 0.834966I$ $b = -0.251357 + 0.560891I$	$-0.165382 + 1.372840I$	$-2.77344 - 4.48022I$
$u = 0.480471 + 1.270420I$ $a = -0.237920 + 1.237410I$ $b = -0.43046 + 2.68133I$	$-7.46645 + 4.93043I$	$-4.23989 - 2.98386I$
$u = 0.480471 - 1.270420I$ $a = -0.237920 - 1.237410I$ $b = -0.43046 - 2.68133I$	$-7.46645 - 4.93043I$	$-4.23989 + 2.98386I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.010735 + 0.596013I$ $a = 0.813209 - 0.794860I$ $b = -0.506054 - 0.754738I$	$-0.165382 - 1.372840I$	$-2.77344 + 4.48022I$
$u = 0.010735 - 0.596013I$ $a = 0.813209 + 0.794860I$ $b = -0.506054 + 0.754738I$	$-0.165382 + 1.372840I$	$-2.77344 - 4.48022I$
$u = 0.415634 + 1.342520I$ $a = 0.405289 - 1.309100I$ $b = 0.51639 - 2.58562I$	-12.1121	$-7.77053 + 0.I$
$u = 0.415634 - 1.342520I$ $a = 0.405289 + 1.309100I$ $b = 0.51639 + 2.58562I$	-12.1121	$-7.77053 + 0.I$

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

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 1 \\ u+1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = 0$ $b = 0.500000 - 0.866025I$	$-4.05977I$	$0. + 6.92820I$
$u = -0.500000 - 0.866025I$ $a = 0$ $b = 0.500000 + 0.866025I$	$4.05977I$	$0. - 6.92820I$

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

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 1 \\ u+1 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ 2u \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = 0$ $b = -1.00000$	0	-3.00000
$u = -0.500000 - 0.866025I$ $a = 0$ $b = -1.00000$	0	-3.00000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_7	$u^4(u^7 - 2u^6 - 3u^5 + 8u^4 - 2u^3 - 2u^2 - u + 2)^2$ $\cdot (u^7 + 5u^6 + 10u^5 + 13u^4 + 18u^3 + 20u^2 + 12u + 4)$
c_2, c_4	$(u^2 - u + 1)^2(u^7 + 5u^6 + 11u^5 + 10u^4 - u^3 - 8u^2 - 4u - 1)$ $\cdot (u^{14} + 8u^{13} + \cdots + 9u + 1)$
c_3, c_8	$(u^2 - u + 1)^2(u^7 + u^6 + 3u^5 + 2u^4 + 3u^3 + 2u^2 + 1)$ $\cdot (u^{14} + 2u^{13} + \cdots + u + 1)$
c_5, c_{10}	$(u^2 + u + 1)^2(u^7 + u^6 + 3u^5 + 2u^4 + 3u^3 + 2u^2 + 1)$ $\cdot (u^{14} + 2u^{13} + \cdots + u + 1)$
c_6, c_9	$(u^2 - u + 1)^2(u^7 - u^6 - 5u^5 + 2u^4 + 7u^3 + 4u^2 + 2u + 1)$ $\cdot (u^{14} - 2u^{13} + \cdots - 5u + 1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y^4(y^7 - 10y^6 + 37y^5 - 62y^4 + 50y^3 - 32y^2 + 9y - 4)^2$ $\cdot (y^7 - 5y^6 + 6y^5 + 15y^4 + 4y^3 - 72y^2 - 16y - 16)$
c_2, c_4	$(y^2 + y + 1)^2(y^7 - 3y^6 + 19y^5 - 50y^4 + 83y^3 - 36y^2 - 1)$ $\cdot (y^{14} - 4y^{13} + \cdots - 15y + 1)$
c_3, c_5, c_8 c_{10}	$(y^2 + y + 1)^2(y^7 + 5y^6 + 11y^5 + 10y^4 - y^3 - 8y^2 - 4y - 1)$ $\cdot (y^{14} + 8y^{13} + \cdots + 9y + 1)$
c_6, c_9	$(y^2 + y + 1)^2(y^7 - 11y^6 + 43y^5 - 62y^4 + 15y^3 + 8y^2 - 4y - 1)$ $\cdot (y^{14} - 16y^{13} + \cdots + 9y + 1)$