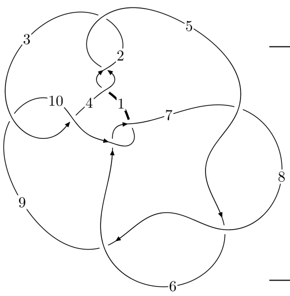
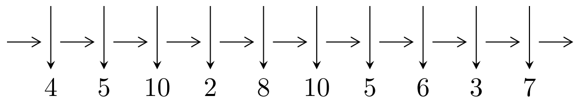
10_{152} $(K10n_{36})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^4 + 2u^3 + b - 2u,\ u^2 + a + 2u + 1,\ u^5 + 3u^4 + 2u^3 - 3u^2 - 3u + 1\rangle$$
$$I_2^u = \langle b,\ a + u + 2,\ u^2 + u - 1\rangle$$
$$I_3^u = \langle b - a - 1,\ a^2 + a - 1,\ u - 1\rangle$$
$$I_4^u = \langle u^3 + 2u^2 + 2b - 1,\ -u^3 - 2u^2 + 2a - 2u + 1,\ u^4 + u^3 + 2u^2 - u + 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 13 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. $\boldsymbol{I_1^u = \langle u^4 + 2u^3 + b - 2u,\ u^2 + a + 2u + 1,\ u^5 + 3u^4 + 2u^3 - 3u^2 - 3u + 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^2 - 2u - 1 \\ -u^4 - 2u^3 + 2u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -2u - 1 \\ -2u^3 - u^2 + 2u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^3 - 2u^2 + 2 \\ u^3 - u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -2u^2 - 2u \\ -2u^4 - 2u^3 + 2u^2 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 2u^3 + 2u^2 - 2u - 1 \\ -4u^4 - 8u^3 + 4u^2 + 8u - 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -8u^4 - 24u^3 - 24u^2 - 10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_7, c_8	$y^5 - 5y^4 + 16y^3 - 27y^2 + 15y - 1$
c_3, c_6, c_9 c_{10}	$y^5 + 3y^4 + 12y^3 - 31y^2 + 11y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.912859$ $a = -3.65903$ $b = -0.390081$	-2.96486	-53.8110
$u = -1.39373$ $a = -0.155021$ $b = -1.14610$	-11.4408	-21.8300
$u = -1.39814 + 0.93867I$ $a = 0.722590 + 0.747455I$ $b = 1.01518 - 1.84157I$	$5.12323 + 8.53607I$	$-12.97824 - 4.17771I$
$u = -1.39814 - 0.93867I$ $a = 0.722590 - 0.747455I$ $b = 1.01518 + 1.84157I$	$5.12323 - 8.53607I$	$-12.97824 + 4.17771I$
$u = 0.277157$ $a = -1.63113$ $b = 0.505833$	-0.775637	-12.4020

II. $I_2^u = \langle b,\ a + u + 2,\ u^2 + u - 1\rangle$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ -u + 1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -u - 2 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -2 \\ u - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -u - 2 \\ 0 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -11$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = -2.61803$ $b = 0$	-2.63189	-11.0000
$u = -1.61803$ $a = -0.381966$ $b = 0$	-10.5276	-11.0000

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -11$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0.618034$ $b = 1.61803$	-10.5276	-11.0000
$u = 1.00000$ $a = -1.61803$ $b = -0.618034$	-2.63189	-11.0000

IV. $\boldsymbol{I_4^u = \langle u^3 + 2u^2 + 2b - 1,\ -u^3 - 2u^2 + 2a - 2u + 1,\ u^4 + u^3 + 2u^2 - u + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -11$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_7, c_8	$y^4 + 3y^3 + 8y^2 + 3y + 1$
c_3, c_6, c_9 c_{10}	$y^4 + 9y^3 + 17y^2 - 24y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.309017 + 0.535233I$ $a = -0.500000 + 0.866025I$ $b = 0.809017 - 0.330792I$	-0.657974	-11.0000
$u = 0.309017 - 0.535233I$ $a = -0.500000 - 0.866025I$ $b = 0.809017 + 0.330792I$	-0.657974	-11.0000
$u = -0.80902 + 1.40126I$ $a = -0.500000 - 0.866025I$ $b = -0.30902 + 2.26728I$	7.23771	-11.0000
$u = -0.80902 - 1.40126I$ $a = -0.500000 + 0.866025I$ $b = -0.30902 - 2.26728I$	7.23771	-11.0000

V. u-Polynomials

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

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_7, c_8	$(y-1)^2(y^2-3y+1)(y^4+3y^3+8y^2+3y+1)$ $\cdot(y^5-5y^4+16y^3-27y^2+15y-1)$
c_3, c_6, c_9 c_{10}	$y^2(y^2-3y+1)(y^4+9y^3+17y^2-24y+16)$ $\cdot(y^5+3y^4+12y^3-31y^2+11y-1)$