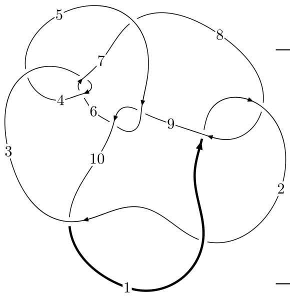
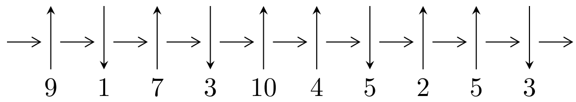
10_{136} $(K10n_3)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle u^4 - u^3 + 6u^2 + 2b - 3u - 1,\ u^4 - u^3 + 6u^2 + 2a - 3u + 1,\ u^5 - u^4 + 5u^3 - 3u^2 - u + 1\rangle \\
I_2^u &= \langle b,\ a + 1,\ u^2 - u + 1\rangle \\
I_3^u &= \langle -7u^5 + 4u^4 - 41u^3 + 14u^2 + 23b - 57u - 18,\ -32u^5 + 15u^4 - 194u^3 + 110u^2 + 23a - 254u - 10, \\
&\quad u^6 + 6u^4 - u^3 + 7u^2 + 3u + 1\rangle \\
I_4^u &= \langle b,\ a - u,\ u^2 - u + 1\rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 15 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. $I^u_1 = \langle u^4-u^3+6u^2+2b-3u-1,\ u^4-u^3+6u^2+2a-3u+1,\ u^5-u^4+5u^3-3u^2-u+1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 5u^4-4u^3+24u^2-9u-4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^5 + u^4 + u^3 - u^2 + u - 1$
c_2, c_4, c_{10}	$u^5 + u^4 + 5u^3 + 3u^2 - u - 1$
c_5, c_9	$u^5 + 5u^4 + 6u^3 - 4u^2 - 8u - 4$
c_7	$u^5 - 4u^4 + 15u^3 - 10u^2 - u - 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^5 + y^4 + 5y^3 + 3y^2 - y - 1$
c_2, c_4, c_{10}	$y^5 + 9y^4 + 17y^3 - 17y^2 + 7y - 1$
c_5, c_9	$y^5 - 13y^4 + 60y^3 - 72y^2 + 32y - 16$
c_7	$y^5 + 14y^4 + 143y^3 - 146y^2 - 39y - 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.581386 + 0.247464I$ $a = -0.410284 - 0.453785I$ $b = 0.589716 - 0.453785I$	$-1.59034 - 1.66520I$	$-2.97976 + 4.53195I$
$u = 0.581386 - 0.247464I$ $a = -0.410284 + 0.453785I$ $b = 0.589716 + 0.453785I$	$-1.59034 + 1.66520I$	$-2.97976 - 4.53195I$
$u = -0.504717$ $a = -2.11802$ $b = -1.11802$	1.42879	7.49490
$u = 0.17097 + 2.22112I$ $a = 1.46930 - 0.60354I$ $b = 2.46930 - 0.60354I$	$14.8579 - 7.7463I$	$4.23230 + 4.04224I$
$u = 0.17097 - 2.22112I$ $a = 1.46930 + 0.60354I$ $b = 2.46930 + 0.60354I$	$14.8579 + 7.7463I$	$4.23230 - 4.04224I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.500000 + 0.866025I$ $a = -1.00000$ $b = 0$	$-4.05977I$	$0. + 6.92820I$
$u = 0.500000 - 0.866025I$ $a = -1.00000$ $b = 0$	$4.05977I$	$0. - 6.92820I$

III. $\boldsymbol{I^u_3 = \langle -7u^5 + 4u^4 + \cdots + 23b - 18,\ -32u^5 + 15u^4 + \cdots + 23a - 10,\ u^6 + 6u^4 - u^3 + 7u^2 + 3u + 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1.39130u^5 - 0.652174u^4 + \cdots + 11.0435u + 0.434783 \\ 0.304348u^5 - 0.173913u^4 + \cdots + 2.47826u + 0.782609 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1.08696u^5 - 0.478261u^4 + \cdots + 8.56522u - 0.347826 \\ 0.304348u^5 - 0.173913u^4 + \cdots + 2.47826u + 0.782609 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1.08696u^5 - 0.478261u^4 + \cdots + 8.56522u - 0.347826 \\ 0.173913u^5 + 0.0434783u^4 + \cdots + 2.13043u + 0.304348 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.217391u^5 - 0.304348u^4 + \cdots + 0.0869565u - 3.13043 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.173913u^5 + 0.0434783u^4 + \cdots + 1.13043u + 2.30435 \\ -0.0869565u^5 + 0.478261u^4 + \cdots - 1.56522u + 0.347826 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.391304u^5 - 0.347826u^4 + \cdots - 2.04348u - 2.43478 \\ 0.0434783u^5 + 0.260870u^4 + \cdots + 1.78261u - 0.173913 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{15}{23}u^5 - \frac{2}{23}u^4 + \frac{101}{23}u^3 - \frac{30}{23}u^2 + \frac{155}{23}u + \frac{101}{23}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^6 + 2u^5 + 2u^4 + u^3 + 3u^2 + 3u + 1$
c_2, c_4, c_{10}	$u^6 + 6u^4 + u^3 + 7u^2 - 3u + 1$
c_5, c_9	$(u^3 - 2u^2 - u - 2)^2$
c_7	$u^6 + u^5 + 14u^4 + 33u^3 + 58u^2 + 45u + 17$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^6 + 6y^4 + y^3 + 7y^2 - 3y + 1$
c_2, c_4, c_{10}	$y^6 + 12y^5 + 50y^4 + 85y^3 + 67y^2 + 5y + 1$
c_5, c_9	$(y^3 - 6y^2 - 7y - 4)^2$
c_7	$y^6 + 27y^5 + 246y^4 + 479y^3 + 870y^2 - 53y + 289$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.447867 + 1.186990I$ $a = 0.183999 + 0.561035I$ $b = 0.329484 + 0.802255I$	$0.60803 - 2.56897I$	$3.12391 + 2.13317I$
$u = 0.447867 - 1.186990I$ $a = 0.183999 - 0.561035I$ $b = 0.329484 - 0.802255I$	$0.60803 + 2.56897I$	$3.12391 - 2.13317I$
$u = -0.221168 + 0.280722I$ $a = -1.50390 + 3.84210I$ $b = 0.329484 + 0.802255I$	$0.60803 - 2.56897I$	$3.12391 + 2.13317I$
$u = -0.221168 - 0.280722I$ $a = -1.50390 - 3.84210I$ $b = 0.329484 - 0.802255I$	$0.60803 + 2.56897I$	$3.12391 - 2.13317I$
$u = -0.22670 + 2.19389I$ $a = -1.68010 - 0.20448I$ $b = -2.65897$	15.2333	$4.75217 + 0.I$
$u = -0.22670 - 2.19389I$ $a = -1.68010 + 0.20448I$ $b = -2.65897$	15.2333	$4.75217 + 0.I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

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

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u^2-u+1)^2(u^5+u^4+u^3-u^2+u-1)$ $\cdot(u^6+2u^5+2u^4+u^3+3u^2+3u+1)$
c_2, c_4	$((u^2+u+1)^2)(u^5+u^4+\cdots-u-1)(u^6+6u^4+\cdots-3u+1)$
c_3, c_8	$(u^2+u+1)^2(u^5+u^4+u^3-u^2+u-1)$ $\cdot(u^6+2u^5+2u^4+u^3+3u^2+3u+1)$
c_5, c_9	$u^4(u^3-2u^2-u-2)^2(u^5+5u^4+6u^3-4u^2-8u-4)$
c_7	$(u^2+u+1)^2(u^5-4u^4+15u^3-10u^2-u-2)$ $\cdot(u^6+u^5+14u^4+33u^3+58u^2+45u+17)$
c_{10}	$((u^2-u+1)^2)(u^5+u^4+\cdots-u-1)(u^6+6u^4+\cdots-3u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$((y^2+y+1)^2)(y^5+y^4+\cdots-y-1)(y^6+6y^4+\cdots-3y+1)$
c_2, c_4, c_{10}	$(y^2+y+1)^2(y^5+9y^4+17y^3-17y^2+7y-1)$ $\cdot\,(y^6+12y^5+50y^4+85y^3+67y^2+5y+1)$
c_5, c_9	$y^4(y^3-6y^2-7y-4)^2(y^5-13y^4+60y^3-72y^2+32y-16)$
c_7	$(y^2+y+1)^2(y^5+14y^4+143y^3-146y^2-39y-4)$ $\cdot\,(y^6+27y^5+246y^4+479y^3+870y^2-53y+289)$