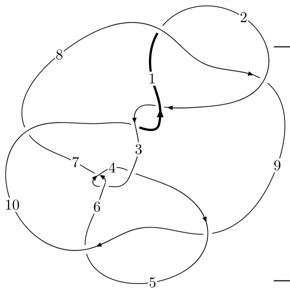
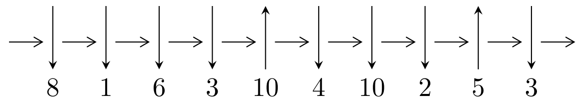
10_{133} ($K10n_4$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle & u^{11} + 5u^{10} + 9u^9 + 2u^8 - 15u^7 - 18u^6 + u^5 + 13u^4 + 5u^3 - u^2 + 4b - 7u + 1, \\ & - u^{11} - 5u^{10} - 11u^9 - 8u^8 + 9u^7 + 24u^6 + 13u^5 - 7u^4 - 13u^3 - 3u^2 + 2a + 5u + 5, \\ & u^{12} + 4u^{11} + 8u^{10} + 5u^9 - 5u^8 - 15u^7 - 9u^6 + 8u^4 + 2u^3 - 2u^2 - 4u - 1\rangle \\ I_2^u = \langle & b^3 + b^2 + 2b + 1,\ a,\ u - 1\rangle \end{aligned}$$

* 2 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.

$\boldsymbol{I_1^u = \langle u^{11}+5u^{10}+\cdots+4b+1,\ -u^{11}-5u^{10}+\cdots+2a+5,\ u^{12}+4u^{11}+\cdots-4u-1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{2}u^{11} + \frac{5}{2}u^{10} + \cdots - \frac{5}{2}u - \frac{5}{2} \\ -\frac{1}{4}u^{11} - \frac{5}{4}u^{10} + \cdots + \frac{7}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^4 - u^2 - 2u + 1 \\ -\frac{1}{4}u^{11} - \frac{3}{4}u^{10} + \cdots + \frac{3}{4}u + \frac{1}{4} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{3}{4}u^{11} + \frac{15}{4}u^{10} + \cdots - \frac{17}{4}u - \frac{9}{4} \\ -\frac{1}{4}u^{11} - \frac{5}{4}u^{10} + \cdots + \frac{7}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{11} - \frac{3}{4}u^{10} + \cdots + \frac{3}{4}u + \frac{1}{4} \\ \frac{1}{4}u^{11} + \frac{3}{4}u^{10} + \cdots + \frac{1}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{3}{2}u^{11} + \frac{9}{2}u^{10} + \cdots - \frac{3}{2}u - \frac{3}{2} \\ -\frac{3}{4}u^{11} - \frac{7}{4}u^{10} + \cdots + \frac{1}{4}u - \frac{3}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= 2u^{11} + \frac{17}{2}u^{10} + 16u^9 + \frac{13}{2}u^8 - \frac{39}{2}u^7 - 34u^6 - 9u^5 + \frac{35}{2}u^4 + 19u^3 + \frac{3}{2}u^2 - 12u - \frac{19}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_8	$u^{12} + 2u^{11} + u^{10} - 2u^9 + u^8 + 6u^7 + 4u^6 - 3u^5 + 6u^3 + 3u^2 - u - 1$
c_2, c_{10}	$u^{12} + 2u^{11} + \cdots + 7u + 1$
c_3, c_6	$u^{12} - 4u^{11} + 8u^{10} - 5u^9 - 5u^8 + 15u^7 - 9u^6 + 8u^4 - 2u^3 - 2u^2 + 4u - 1$
c_4	$u^{12} + 14u^{10} + \cdots + 12u + 1$
c_5, c_9	$u^{12} + u^{11} + \cdots + 36u + 8$
c_7	$u^{12} - 2u^{11} + \cdots - 175u - 49$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$y^{12} - 2y^{11} + \cdots - 7y + 1$
c_2, c_{10}	$y^{12} + 18y^{11} + \cdots - 7y + 1$
c_3, c_6	$y^{12} + 14y^{10} + \cdots - 12y + 1$
c_4	$y^{12} + 28y^{11} + \cdots - 136y + 1$
c_5, c_9	$y^{12} - 21y^{11} + \cdots - 464y + 64$
c_7	$y^{12} + 54y^{11} + \cdots - 39739y + 2401$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.267707+0.884422I$ $a=\ \ 0.991606+0.968229I$ $b=\ \ 0.208639-1.095630I$	$3.72986-1.03019I$	$-1.27943+1.44119I$
$u=-0.267707-0.884422I$ $a=\ \ 0.991606-0.968229I$ $b=\ \ 0.208639+1.095630I$	$3.72986+1.03019I$	$-1.27943-1.44119I$
$u=-0.561933+0.696285I$ $a=-0.925264-0.846250I$ $b=-0.544421+1.250460I$	$2.66318+4.39533I$	$-2.94428-5.22312I$
$u=-0.561933-0.696285I$ $a=-0.925264+0.846250I$ $b=-0.544421-1.250460I$	$2.66318-4.39533I$	$-2.94428+5.22312I$
$u=\ \ 1.11609$ $a=\ \ 0.469158$ $b=-0.247448$	-2.23241	0.00782210
$u=\ \ 0.703419+0.354505I$ $a=\ \ 0.543453+0.851824I$ $b=-0.137910-0.436156I$	$-0.87372-1.32529I$	$-6.28742+4.78445I$
$u=\ \ 0.703419-0.354505I$ $a=\ \ 0.543453-0.851824I$ $b=-0.137910+0.436156I$	$-0.87372+1.32529I$	$-6.28742-4.78445I$
$u=-1.18067+1.13803I$ $a=-0.702429-1.111310I$ $b=-0.15451+1.86459I$	$14.0447+7.7983I$	$-3.16952-4.22102I$
$u=-1.18067-1.13803I$ $a=-0.702429+1.111310I$ $b=-0.15451-1.86459I$	$14.0447-7.7983I$	$-3.16952+4.22102I$
$u=-1.10559+1.21488I$ $a=\ \ 0.744589+1.118150I$ $b=\ \ 0.11602-1.80584I$	$14.3370+0.8045I$	$-2.71291+0.16086I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.10559 - 1.21488I$ $a = \quad 0.744589 - 1.118150I$ $b = \quad 0.11602 + 1.80584I$	$14.3370 - 0.8045I$	$-2.71291 - 0.16086I$
$u = -0.291129$ $a = -1.77307$ $b = -0.728189$	-1.41716	-6.22070

II. $I_2^u = \langle b^3 + b^2 + 2b + 1,\ a,\ u - 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -7b^2 - 5b - 17$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0$ $b = -0.215080 + 1.307140I$	$1.37919 + 2.82812I$	$-4.28809 - 2.59975I$
$u = 1.00000$ $a = 0$ $b = -0.215080 - 1.307140I$	$1.37919 - 2.82812I$	$-4.28809 + 2.59975I$
$u = 1.00000$ $a = 0$ $b = -0.569840$	-2.75839	-16.4240

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	(u^3-u^2+1) $\cdot(u^{12}+2u^{11}+u^{10}-2u^9+u^8+6u^7+4u^6-3u^5+6u^3+3u^2-u-1)$
c_2	$(u^3+u^2+2u+1)(u^{12}+2u^{11}+\cdots+7u+1)$
c_3	$(u-1)^3$ $\cdot(u^{12}-4u^{11}+8u^{10}-5u^9-5u^8+15u^7-9u^6+8u^4-2u^3-2u^2+4u-1)$
c_4	$((u+1)^3)(u^{12}+14u^{10}+\cdots+12u+1)$
c_5, c_9	$u^3(u^{12}+u^{11}+\cdots+36u+8)$
c_6	$(u+1)^3$ $\cdot(u^{12}-4u^{11}+8u^{10}-5u^9-5u^8+15u^7-9u^6+8u^4-2u^3-2u^2+4u-1)$
c_7	$(u^3-u^2+2u-1)(u^{12}-2u^{11}+\cdots-175u-49)$
c_8	(u^3+u^2-1) $\cdot(u^{12}+2u^{11}+u^{10}-2u^9+u^8+6u^7+4u^6-3u^5+6u^3+3u^2-u-1)$
c_{10}	$(u^3-u^2+2u-1)(u^{12}+2u^{11}+\cdots+7u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_8	$(y^3 - y^2 + 2y - 1)(y^{12} - 2y^{11} + \cdots - 7y + 1)$
c_2, c_{10}	$(y^3 + 3y^2 + 2y - 1)(y^{12} + 18y^{11} + \cdots - 7y + 1)$
c_3, c_6	$((y-1)^3)(y^{12} + 14y^{10} + \cdots - 12y + 1)$
c_4	$((y-1)^3)(y^{12} + 28y^{11} + \cdots - 136y + 1)$
c_5, c_9	$y^3(y^{12} - 21y^{11} + \cdots - 464y + 64)$
c_7	$(y^3 + 3y^2 + 2y - 1)(y^{12} + 54y^{11} + \cdots - 39739y + 2401)$