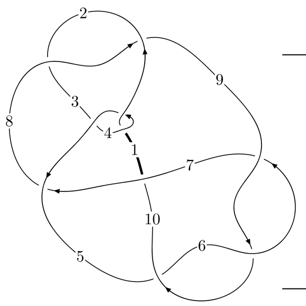
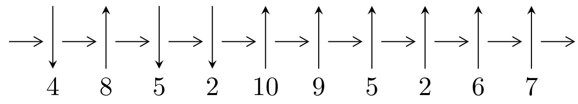
10_{130} $(K10n_{20})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle & -u^7 + u^6 - 4u^5 + 3u^4 - 4u^3 + 2u^2 + b - 1, \\ & -u^{10} + 2u^9 - 8u^8 + 11u^7 - 20u^6 + 19u^5 - 17u^4 + 8u^3 - u^2 + a - 5u + 1, \\ & u^{11} - 2u^{10} + 8u^9 - 12u^8 + 22u^7 - 24u^6 + 24u^5 - 15u^4 + 7u^3 + 3u^2 - 2u + 1\rangle \\ I_2^u = \langle & b + 1,\ -u^2 + a - u - 1,\ u^3 + u^2 + 2u + 1\rangle \end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 14 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. $\boldsymbol{I_1^u = \langle -u^7 + u^6 - 4u^5 + 3u^4 - 4u^3 + 2u^2 + b - 1,\ -u^{10} + 2u^9 + \cdots + a + 1,\ u^{11} - 2u^{10} + \cdots - 2u + 1\rangle}$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} u^{10} - 2u^9 + 8u^8 - 11u^7 + 20u^6 - 19u^5 + 17u^4 - 8u^3 + u^2 + 5u - 1 \\ u^7 - u^6 + 4u^5 - 3u^4 + 4u^3 - 2u^2 + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{10} + 2u^9 - 7u^8 + 10u^7 - 16u^6 + 15u^5 - 13u^4 + 4u^3 - u^2 - 4u + 1 \\ u^8 - u^7 + 5u^6 - 4u^5 + 7u^4 - 4u^3 + 2u^2 + u - 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^5 + 2u^3 + u \\ -u^7 - 3u^5 - 2u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^{10} + 2u^9 - 6u^8 + 9u^7 - 11u^6 + 11u^5 - 6u^4 + u^2 - 3u \\ u^8 - u^7 + 5u^6 - 4u^5 + 7u^4 - 4u^3 + 2u^2 + u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^4 - u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= -u^{10} + 2u^9 - 7u^8 + 8u^7 - 12u^6 + 3u^5 + 3u^4 - 16u^3 + 15u^2 - 13u + 1$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^{11} - 4u^{10} - u^9 + 17u^8 + u^7 - 40u^6 + 3u^5 + 37u^4 - 3u^3 - 9u^2 + 7u - 1$
c_2, c_8	$u^{11} - u^{10} + \cdots - 4u - 8$
c_3	$u^{11} + 18u^{10} + \cdots + 31u + 1$
c_5, c_6, c_9	$u^{11} + 2u^{10} + \cdots - 2u - 1$
c_7	$u^{11} + 12u^9 + 36u^7 - 2u^6 + 2u^5 - 13u^4 + 13u^3 - u^2 - 1$
c_{10}	$u^{11} - 2u^{10} + \cdots - 6u - 9$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^{11} - 18y^{10} + \cdots + 31y - 1$
c_2, c_8	$y^{11} + 21y^{10} + \cdots + 336y - 64$
c_3	$y^{11} - 46y^{10} + \cdots + 863y - 1$
c_5, c_6, c_9	$y^{11} + 12y^{10} + \cdots - 2y - 1$
c_7	$y^{11} + 24y^{10} + \cdots - 2y - 1$
c_{10}	$y^{11} + 12y^{10} + \cdots - 594y - 81$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.816018 + 0.563764I$ $a = -0.368670 - 1.053910I$ $b = -1.86528 + 0.08844I$	$-12.35850 + 2.70718I$	$0.47291 - 2.44627I$
$u = 0.816018 - 0.563764I$ $a = -0.368670 + 1.053910I$ $b = -1.86528 - 0.08844I$	$-12.35850 - 2.70718I$	$0.47291 + 2.44627I$
$u = -0.157733 + 1.338590I$ $a = -0.577850 + 0.189675I$ $b = -0.283200 + 0.366521I$	$-3.43504 - 2.25109I$	$3.70368 + 2.34373I$
$u = -0.157733 - 1.338590I$ $a = -0.577850 - 0.189675I$ $b = -0.283200 - 0.366521I$	$-3.43504 + 2.25109I$	$3.70368 - 2.34373I$
$u = 0.05807 + 1.49843I$ $a = 1.69315 + 0.17490I$ $b = 1.26769 - 0.68760I$	$-8.01785 + 1.82060I$	$-2.54374 - 1.21714I$
$u = 0.05807 - 1.49843I$ $a = 1.69315 - 0.17490I$ $b = 1.26769 + 0.68760I$	$-8.01785 - 1.82060I$	$-2.54374 + 1.21714I$
$u = -0.480017$ $a = -0.562904$ $b = -0.182568$	0.824865	12.3320
$u = 0.238107 + 0.385438I$ $a = 0.41631 + 1.75871I$ $b = 0.911055 - 0.299346I$	$-1.69473 + 0.83621I$	$-2.12521 - 2.51411I$
$u = 0.238107 - 0.385438I$ $a = 0.41631 - 1.75871I$ $b = 0.911055 + 0.299346I$	$-1.69473 - 0.83621I$	$-2.12521 + 2.51411I$
$u = 0.28555 + 1.56335I$ $a = -1.88149 - 0.96849I$ $b = -1.93898 + 0.26128I$	$-19.3195 + 6.7782I$	$-2.17368 - 2.81310I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.28555 - 1.56335I$		
$a = -1.88149 + 0.96849I$	$-19.3195 - 6.7782I$	$-2.17368 + 2.81310I$
$b = -1.93898 - 0.26128I$		

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^2+4u+4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.215080+1.307140I$ $a=-0.877439+0.744862I$ $b=-1.00000$	$-4.66906-2.82812I$	$-1.84740+3.54173I$
$u=-0.215080-1.307140I$ $a=-0.877439-0.744862I$ $b=-1.00000$	$-4.66906+2.82812I$	$-1.84740-3.54173I$
$u=-0.569840$ $a=\ \ 0.754878$ $b=-1.00000$	-0.531480	2.69480

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)^3$ $\cdot(u^{11}-4u^{10}-u^9+17u^8+u^7-40u^6+3u^5+37u^4-3u^3-9u^2+7u-1)$
c_2, c_8	$u^3(u^{11}-u^{10}+\cdots-4u-8)$
c_3	$((u-1)^3)(u^{11}+18u^{10}+\cdots+31u+1)$
c_4	$(u+1)^3$ $\cdot(u^{11}-4u^{10}-u^9+17u^8+u^7-40u^6+3u^5+37u^4-3u^3-9u^2+7u-1)$
c_5, c_6	$(u^3+u^2+2u+1)(u^{11}+2u^{10}+\cdots-2u-1)$
c_7	$(u^3+u^2-1)(u^{11}+12u^9+36u^7-2u^6+2u^5-13u^4+13u^3-u^2-1)$
c_9	$(u^3-u^2+2u-1)(u^{11}+2u^{10}+\cdots-2u-1)$
c_{10}	$(u^3+u^2-1)(u^{11}-2u^{10}+\cdots-6u-9)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4	$((y-1)^3)(y^{11} - 18y^{10} + \cdots + 31y - 1)$
c_2, c_8	$y^3(y^{11} + 21y^{10} + \cdots + 336y - 64)$
c_3	$((y-1)^3)(y^{11} - 46y^{10} + \cdots + 863y - 1)$
c_5, c_6, c_9	$(y^3 + 3y^2 + 2y - 1)(y^{11} + 12y^{10} + \cdots - 2y - 1)$
c_7	$(y^3 - y^2 + 2y - 1)(y^{11} + 24y^{10} + \cdots - 2y - 1)$
c_{10}	$(y^3 - y^2 + 2y - 1)(y^{11} + 12y^{10} + \cdots - 594y - 81)$