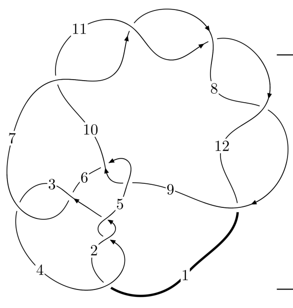
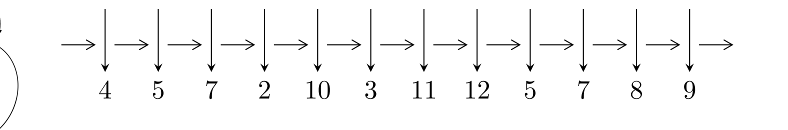
$12n_{0679}$ ($K12n_{0679}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$7,10 \xrightarrow[c_{10}]{} 11 \xrightarrow[c_7]{} 8 \xrightarrow[c_{11}]{} 3,12 \xrightarrow[c_6]{} 6 \xrightarrow[c_5]{} 5 \xrightarrow[c_2]{} 2 \xrightarrow[c_4]{} 4 \xrightarrow[c_1]{} 1 \xrightarrow[c_9]{} 9 \twoheadrightarrow c_3, c_8, c_{12}$$

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

$$\begin{aligned}
I_1^u &= \langle -272506u^{18} - 964931u^{17} + \cdots + 166246b - 454705, \\
&\quad 202199u^{18} + 697603u^{17} + \cdots + 166246a + 690296,\ u^{19} + 4u^{18} + \cdots + 6u + 1\rangle \\
I_2^u &= \langle u^2 + b + u - 2,\ a,\ u^3 + u^2 - 2u - 1\rangle \\
I_3^u &= \langle b - 1,\ a + 1,\ u^2 - u - 1\rangle \\
I_4^u &= \langle b + u + 1,\ a + u - 2,\ u^2 - u - 1\rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 26 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.
$$I_1^u = \langle -2.73\times10^{5}u^{18} - 9.65\times10^{5}u^{17} + \cdots + 1.66\times10^{5}b - 4.55\times10^{5},\ 2.02\times10^{5}u^{18} + 6.98\times10^{5}u^{17} + \cdots + 1.66\times10^{5}a + 6.90\times10^{5},\ u^{19} + 4u^{18} + \cdots + 6u + 1\rangle$$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -1.21626u^{18} - 4.19621u^{17} + \cdots - 17.4998u - 4.15226 \\ 1.63917u^{18} + 5.80424u^{17} + \cdots + 13.5564u + 2.73513 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1.42025u^{18} - 4.28958u^{17} + \cdots - 12.9625u - 2.68015 \\ 0.636515u^{18} + 1.48579u^{17} + \cdots + 2.46235u - 0.167595 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.783736u^{18} - 2.80379u^{17} + \cdots - 10.5002u - 2.84774 \\ 0.636515u^{18} + 1.48579u^{17} + \cdots + 2.46235u - 0.167595 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.783736u^{18} - 2.80379u^{17} + \cdots - 10.5002u - 2.84774 \\ 0.912202u^{18} + 3.77581u^{17} + \cdots + 10.4811u + 2.39994 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -1.21626u^{18} - 4.19621u^{17} + \cdots - 17.4998u - 4.15226 \\ 0.949954u^{18} + 3.82918u^{17} + \cdots + 10.7596u + 2.06629 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^4 + 3u^2 - 1 \\ -u^6 + 4u^4 - 3u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^3 - 2u \\ u^5 - 3u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{6730797}{166246}u^{18} + \frac{11675065}{83123}u^{17} + \cdots + \frac{25540453}{83123}u + \frac{10182639}{166246}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{19} - 6u^{18} + \cdots + 15u + 1$
c_3, c_6	$u^{19} + 3u^{18} + \cdots + 4u + 8$
c_5, c_9	$u^{19} - 2u^{18} + \cdots + 32u + 16$
c_7, c_8, c_{10} c_{11}, c_{12}	$u^{19} + 4u^{18} + \cdots + 6u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{19} - 8y^{18} + \cdots + 227y - 1$
c_3, c_6	$y^{19} + 15y^{18} + \cdots + 2448y - 64$
c_5, c_9	$y^{19} + 20y^{18} + \cdots + 6272y - 256$
c_7, c_8, c_{10} c_{11}, c_{12}	$y^{19} - 22y^{18} + \cdots - 6y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.371183 + 0.912603I$ $a = -1.80989 - 0.68295I$ $b = 1.53400 + 0.07023I$	$6.24887 + 1.03604I$	$-13.20409 - 0.16139I$
$u = 0.371183 - 0.912603I$ $a = -1.80989 + 0.68295I$ $b = 1.53400 - 0.07023I$	$6.24887 - 1.03604I$	$-13.20409 + 0.16139I$
$u = 0.754085 + 0.801793I$ $a = 1.59489 + 0.69061I$ $b = -1.59706 + 0.29496I$	$5.09846 - 6.69074I$	$-15.1331 + 4.7970I$
$u = 0.754085 - 0.801793I$ $a = 1.59489 - 0.69061I$ $b = -1.59706 - 0.29496I$	$5.09846 + 6.69074I$	$-15.1331 - 4.7970I$
$u = 0.788633$ $a = -1.87771$ $b = 0.117506$	-10.1632	-31.8240
$u = -1.296690 + 0.113032I$ $a = -0.844571 - 0.789505I$ $b = 1.171320 + 0.089530I$	$-4.61857 + 1.71767I$	$-18.2481 - 1.2911I$
$u = -1.296690 - 0.113032I$ $a = -0.844571 + 0.789505I$ $b = 1.171320 - 0.089530I$	$-4.61857 - 1.71767I$	$-18.2481 + 1.2911I$
$u = -0.541707$ $a = 0.445654$ $b = -3.62686$	-2.44677	-98.2800
$u = -1.44566 + 0.37064I$ $a = 0.833635 - 0.884796I$ $b = -1.51545 - 0.17161I$	$0.51136 + 3.59146I$	$-15.7311 - 1.9367I$
$u = -1.44566 - 0.37064I$ $a = 0.833635 + 0.884796I$ $b = -1.51545 + 0.17161I$	$0.51136 - 3.59146I$	$-15.7311 + 1.9367I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.49235 + 0.21013I$ $a = 0.018135 - 0.695055I$ $b = 0.526738 - 0.141756I$	$-6.67966 - 1.72802I$	$-16.2689 + 1.8813I$
$u = 1.49235 - 0.21013I$ $a = 0.018135 + 0.695055I$ $b = 0.526738 + 0.141756I$	$-6.67966 + 1.72802I$	$-16.2689 - 1.8813I$
$u = 1.60645$ $a = -0.333194$ $b = 3.67997$	-10.0473	-54.2350
$u = -0.369925$ $a = -0.699220$ $b = -0.403627$	-0.654259	-14.8880
$u = -1.65257 + 0.26840I$ $a = -0.793286 + 0.765963I$ $b = 1.67968 + 0.52712I$	$-2.92778 + 10.79900I$	$-18.2574 - 5.0475I$
$u = -1.65257 - 0.26840I$ $a = -0.793286 - 0.765963I$ $b = 1.67968 - 0.52712I$	$-2.92778 - 10.79900I$	$-18.2574 + 5.0475I$
$u = -0.082620 + 0.268767I$ $a = -0.49970 - 2.54134I$ $b = -0.546098 + 0.125693I$	$-0.761541 - 0.128012I$	$-12.14415 - 0.42322I$
$u = -0.082620 - 0.268767I$ $a = -0.49970 + 2.54134I$ $b = -0.546098 - 0.125693I$	$-0.761541 + 0.128012I$	$-12.14415 + 0.42322I$
$u = -1.76360$ $a = 0.466063$ $b = -0.273248$	19.6998	-27.7990

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -8u^2 - 7u + 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^3$
c_3, c_6	u^3
c_4	$(u+1)^3$
c_5, c_7, c_8	$u^3 - u^2 - 2u + 1$
c_9, c_{10}, c_{11} c_{12}	$u^3 + u^2 - 2u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^3$
c_3, c_6	y^3
c_5, c_7, c_8 c_9, c_{10}, c_{11} c_{12}	$y^3 - 5y^2 + 6y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.24698$ $a = 0$ $b = -0.801938$	-7.98968	-19.1690
$u = -0.445042$ $a = 0$ $b = 2.24698$	-2.34991	3.53080
$u = -1.80194$ $a = 0$ $b = 0.554958$	-19.2692	-11.3620

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

(i) Arc colorings

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

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

$$a_{11} = \begin{pmatrix} 1 \\ u+1 \end{pmatrix}$$

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

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

$$a_{12} = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

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

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

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

$$a_4 = \begin{pmatrix} -1 \\ -u \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -19$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_7, c_8	$u^2 + u - 1$
c_4, c_6, c_{10} c_{11}, c_{12}	$u^2 - u - 1$
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}, c_{11} c_{12}	$y^2 - 3y + 1$
c_5, c_9	y^2

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = -1.00000$ $b = \quad 1.00000$	-1.97392	-19.0000
$u = \quad 1.61803$ $a = -1.00000$ $b = \quad 1.00000$	-17.7653	-19.0000

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_7, c_8	$u^2 + u - 1$
c_4, c_6, c_{10} c_{11}, c_{12}	$u^2 - u - 1$
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}, c_{11} c_{12}	$y^2 - 3y + 1$
c_5, c_9	y^2

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_4	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = 2.61803$ $b = -0.381966$	-9.86960	-4.00000
$u = 1.61803$ $a = 0.381966$ $b = -2.61803$	-9.86960	-4.00000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^3)(u^2+u-1)^2(u^{19}-6u^{18}+\cdots+15u+1)$
c_3	$u^3(u^2+u-1)^2(u^{19}+3u^{18}+\cdots+4u+8)$
c_4	$((u+1)^3)(u^2-u-1)^2(u^{19}-6u^{18}+\cdots+15u+1)$
c_5	$u^4(u^3-u^2-2u+1)(u^{19}-2u^{18}+\cdots+32u+16)$
c_6	$u^3(u^2-u-1)^2(u^{19}+3u^{18}+\cdots+4u+8)$
c_7, c_8	$((u^2+u-1)^2)(u^3-u^2-2u+1)(u^{19}+4u^{18}+\cdots+6u+1)$
c_9	$u^4(u^3+u^2-2u-1)(u^{19}-2u^{18}+\cdots+32u+16)$
c_{10}, c_{11}, c_{12}	$((u^2-u-1)^2)(u^3+u^2-2u-1)(u^{19}+4u^{18}+\cdots+6u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y-1)^3)(y^2-3y+1)^2(y^{19}-8y^{18}+\cdots+227y-1)$
c_3, c_6	$y^3(y^2-3y+1)^2(y^{19}+15y^{18}+\cdots+2448y-64)$
c_5, c_9	$y^4(y^3-5y^2+6y-1)(y^{19}+20y^{18}+\cdots+6272y-256)$
c_7, c_8, c_{10} c_{11}, c_{12}	$((y^2-3y+1)^2)(y^3-5y^2+6y-1)(y^{19}-22y^{18}+\cdots-6y-1)$