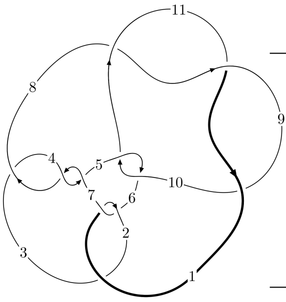
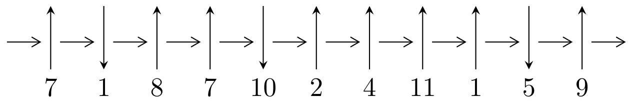
$11n_{99}$ $(K11n_{99})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -1338u^{11} - 2403u^{10} + \cdots + 24722b + 1642,\ -2813u^{11} - 3694u^{10} + \cdots + 49444a - 23561, \\
&\quad u^{12} - 2u^{11} - 3u^{10} + 7u^9 + 3u^8 - 10u^7 + 12u^6 - 17u^5 - 14u^4 + 34u^3 + 2u^2 - 7u - 4 \rangle \\
I_2^u &= \langle u^5 - u^4 + u^2a - u^3 + 2u^2 + b - a - 1,\ -u^5 + 2u^3a + 2u^4 - 2u^2a + a^2 - au - 2u^2 + 2a + 2u - 1, \\
&\quad u^6 - u^5 - u^4 + 2u^3 - u + 1 \rangle \\
I_3^u &= \langle -au + b - a + 1,\ a^2 + 2au - 4a - 6u + 10,\ u^2 - u - 1 \rangle \\
I_4^u &= \langle b - 1,\ 2a + 1,\ u + 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 29 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. $\boldsymbol{I^u_1 = \langle -1338u^{11} - 2403u^{10} + \cdots + 24722b + 1642,\ -2813u^{11} - 3694u^{10} + \cdots + 49444a - 23561,\ u^{12} - 2u^{11} + \cdots - 7u - 4\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.0568926u^{11} + 0.0747108u^{10} + \cdots + 2.87250u + 0.476519 \\ 0.0541218u^{11} + 0.0972009u^{10} + \cdots + 0.203098u - 0.0664186 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.00277081u^{11} - 0.0224901u^{10} + \cdots + 2.66940u + 0.542937 \\ 0.0541218u^{11} + 0.0972009u^{10} + \cdots + 0.203098u - 0.0664186 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 0.0205687u^{11} + 0.0812232u^{10} + \cdots + 1.83784u + 0.263996 \\ -0.273036u^{11} + 0.227126u^{10} + \cdots - 1.67482u - 0.902597 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.0335531u^{11} - 0.0159777u^{10} + \cdots - 1.36526u + 0.330414 \\ 0.0697355u^{11} - 0.157269u^{10} + \cdots + 1.27813u + 0.343419 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.0774614u^{11} + 0.155934u^{10} + \cdots + 3.71034u + 0.740515 \\ -0.218914u^{11} + 0.324327u^{10} + \cdots - 2.47173u - 0.969015 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.182105u^{11} - 0.175188u^{10} + \cdots - 1.19481u + 0.409554 \\ 0.00392363u^{11} - 0.236227u^{10} + \cdots + 1.73259u + 0.429415 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{43847}{49444}u^{11} + \frac{112737}{49444}u^{10} + \frac{32482}{12361}u^9 - \frac{383109}{49444}u^8 - \frac{28567}{12361}u^7 + \frac{985}{94}u^6 - \frac{299113}{24722}u^5 + \frac{967541}{49444}u^4 + \frac{605165}{49444}u^3 - \frac{1852919}{49444}u^2 + \frac{20717}{49444}u + \frac{92353}{12361}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$u^{12} - u^{11} + \cdots + u - 1$
c_2	$u^{12} + 15u^{11} + \cdots - 7u + 1$
c_5, c_{10}	$u^{12} - 3u^{11} + \cdots - 30u + 8$
c_8, c_9, c_{11}	$u^{12} + 2u^{11} + \cdots + 7u - 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$y^{12} + 15y^{11} + \cdots - 7y + 1$
c_2	$y^{12} - 37y^{11} + \cdots - 75y + 1$
c_5, c_{10}	$y^{12} + 3y^{11} + \cdots - 180y + 64$
c_8, c_9, c_{11}	$y^{12} - 10y^{11} + \cdots - 65y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.10462$ $a = -0.677570$ $b = 0.286848$	2.08000	2.69920
$u = 0.811259$ $a = 0.740294$ $b = -1.25251$	2.82934	-4.50160
$u = 0.038537 + 1.279810I$ $a = 0.05191 - 1.51413I$ $b = 0.22221 - 1.69295I$	$-13.9790 - 4.8530I$	$0.50797 + 2.30086I$
$u = 0.038537 - 1.279810I$ $a = 0.05191 + 1.51413I$ $b = 0.22221 + 1.69295I$	$-13.9790 + 4.8530I$	$0.50797 - 2.30086I$
$u = 1.51234 + 0.05980I$ $a = 0.151707 + 0.418299I$ $b = -0.376488 + 0.828316I$	$6.26923 - 1.30619I$	$9.66269 + 5.18573I$
$u = 1.51234 - 0.05980I$ $a = 0.151707 - 0.418299I$ $b = -0.376488 - 0.828316I$	$6.26923 + 1.30619I$	$9.66269 - 5.18573I$
$u = 1.41659 + 0.65856I$ $a = -0.972994 + 0.888579I$ $b = 0.46036 + 1.59632I$	$-9.7228 + 11.6344I$	$3.05947 - 5.63312I$
$u = 1.41659 - 0.65856I$ $a = -0.972994 - 0.888579I$ $b = 0.46036 - 1.59632I$	$-9.7228 - 11.6344I$	$3.05947 + 5.63312I$
$u = -0.312665 + 0.284545I$ $a = -0.598564 + 1.005440I$ $b = -0.257303 + 0.306472I$	$0.367468 - 0.926038I$	$6.49064 + 7.55473I$
$u = -0.312665 - 0.284545I$ $a = -0.598564 - 1.005440I$ $b = -0.257303 - 0.306472I$	$0.367468 + 0.926038I$	$6.49064 - 7.55473I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.50812+0.67127I$ $a=\quad 0.711581+0.645229I$ $b=-0.06595+1.61394I$	$-9.24108-2.07346I$	$2.05543+1.04459I$
$u=-1.50812-0.67127I$ $a=\quad 0.711581-0.645229I$ $b=-0.06595-1.61394I$	$-9.24108+2.07346I$	$2.05543-1.04459I$

II. $\boldsymbol{I_2^u = \langle u^5 - u^4 + u^2a - u^3 + 2u^2 + b - a - 1,\ -u^5 + 2u^4 + \cdots + 2a - 1,\ u^6 - u^5 - u^4 + 2u^3 - u + 1\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a \\ -u^5 + u^4 - u^2a + u^3 - 2u^2 + a + 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^5 - u^4 + u^2a - u^3 + 2u^2 - 1 \\ -u^5 + u^4 - u^2a + u^3 - 2u^2 + a + 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^5a - u^4a + u^5 - 2u^3a - u^4 + 2u^2a - 2u^3 + au + 2u^2 - a + 2u - 1 \\ 2u^5a - 3u^3a + u^4 - 2u^3 + 2au - 2u^2 + 2u + 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u^5a - u^4a + u^5 - 2u^3a - u^4 + 2u^2a + au - a + 1 \\ u^5a - u^5 - 2u^3a + u^4 + 2u^3 + au - 2u^2 - u + 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^4 - u^2 + 1 \\ -2u^5 + u^4 + 4u^3 - 2u^2 - 2u + 2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -2u^4 + 2u^2 - u - 2 \\ 4u^5 - 2u^4 - 6u^3 + 4u^2 + 3u - 4 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$u^{12} + 3u^{11} + \cdots + 12u + 9$
c_2	$u^{12} + 11u^{11} + \cdots + 432u + 81$
c_5, c_8, c_9 c_{10}, c_{11}	$(u^6 + u^5 - u^4 - 2u^3 + u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$y^{12} + 11y^{11} + \cdots + 432y + 81$
c_2	$y^{12} - 21y^{11} + \cdots - 8100y + 6561$
c_5, c_8, c_9 c_{10}, c_{11}	$(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.002190 + 0.295542I$ $a = 1.63266 - 0.89783I$ $b = -0.250689 + 0.621966I$	$-1.39926 - 0.92430I$	$7.71672 + 0.79423I$
$u = -1.002190 + 0.295542I$ $a = -1.31279 - 1.72080I$ $b = -0.007520 - 1.191130I$	$-1.39926 - 0.92430I$	$7.71672 + 0.79423I$
$u = -1.002190 - 0.295542I$ $a = 1.63266 + 0.89783I$ $b = -0.250689 - 0.621966I$	$-1.39926 + 0.92430I$	$7.71672 - 0.79423I$
$u = -1.002190 - 0.295542I$ $a = -1.31279 + 1.72080I$ $b = -0.007520 + 1.191130I$	$-1.39926 + 0.92430I$	$7.71672 - 0.79423I$
$u = 0.428243 + 0.664531I$ $a = 0.0287467 + 0.1266650I$ $b = 0.793458 - 0.920250I$	$-5.18047 - 0.92430I$	$0.283283 + 0.794226I$
$u = 0.428243 + 0.664531I$ $a = -1.13932 + 1.53189I$ $b = 0.12359 + 1.51263I$	$-5.18047 - 0.92430I$	$0.283283 + 0.794226I$
$u = 0.428243 - 0.664531I$ $a = 0.0287467 - 0.1266650I$ $b = 0.793458 + 0.920250I$	$-5.18047 + 0.92430I$	$0.283283 - 0.794226I$
$u = 0.428243 - 0.664531I$ $a = -1.13932 - 1.53189I$ $b = 0.12359 - 1.51263I$	$-5.18047 + 0.92430I$	$0.283283 - 0.794226I$
$u = 1.073950 + 0.558752I$ $a = -0.598264 + 0.445195I$ $b = 1.172060 + 0.407463I$	$-3.28987 + 5.69302I$	$4.00000 - 5.51057I$
$u = 1.073950 + 0.558752I$ $a = 0.888970 - 1.003950I$ $b = -0.33089 - 1.60761I$	$-3.28987 + 5.69302I$	$4.00000 - 5.51057I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.073950 - 0.558752I$ $a = -0.598264 - 0.445195I$ $b = 1.172060 - 0.407463I$	$-3.28987 - 5.69302I$	$4.00000 + 5.51057I$
$u = 1.073950 - 0.558752I$ $a = 0.888970 + 1.003950I$ $b = -0.33089 + 1.60761I$	$-3.28987 - 5.69302I$	$4.00000 + 5.51057I$

III. $\boldsymbol{I_3^u = \langle -au + b - a + 1,\ a^2 + 2au - 4a - 6u + 10,\ u^2 - u - 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$(u^2+1)^2$
c_2	$(u+1)^4$
c_5, c_{10}	u^4+3u^2+1
c_8, c_9	$(u^2-u-1)^2$
c_{11}	$(u^2+u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$(y+1)^4$
c_2	$(y-1)^4$
c_5, c_{10}	$(y^2+3y+1)^2$
c_8, c_9, c_{11}	$(y^2-3y+1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = 2.61803 + 2.61803I$ $b = 1.000000I$	-2.30291	4.00000
$u = -0.618034$ $a = 2.61803 - 2.61803I$ $b = -1.000000I$	-2.30291	4.00000
$u = 1.61803$ $a = 0.381966 + 0.381966I$ $b = 1.000000I$	5.59278	4.00000
$u = 1.61803$ $a = 0.381966 - 0.381966I$ $b = -1.000000I$	5.59278	4.00000

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

(i) Arc colorings

$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

$a_{11} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$

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

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

$a_4 = \begin{pmatrix} -0.5 \\ 1 \end{pmatrix}$

$a_3 = \begin{pmatrix} -1.5 \\ 1 \end{pmatrix}$

$a_2 = \begin{pmatrix} -0.5 \\ 1 \end{pmatrix}$

$a_7 = \begin{pmatrix} 0.5 \\ 1 \end{pmatrix}$

$a_5 = \begin{pmatrix} 0 \\ 2 \end{pmatrix}$

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 14.25$

(iv) u-Polynomials at the component

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

(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_9, c_{11}	$y-1$
c_5, c_{10}	y

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = -0.500000$ $b = \quad 1.00000$	3.28987	14.2500

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4	$(u+1)(u^2+1)^2(u^{12}-u^{11}+\cdots+u-1)(u^{12}+3u^{11}+\cdots+12u+9)$
c_2	$(u-1)(u+1)^4(u^{12}+11u^{11}+\cdots+432u+81)$ $\cdot(u^{12}+15u^{11}+\cdots-7u+1)$
c_5, c_{10}	$u(u^4+3u^2+1)(u^6+u^5+\cdots+u+1)^2(u^{12}-3u^{11}+\cdots-30u+8)$
c_6, c_7	$(u-1)(u^2+1)^2(u^{12}-u^{11}+\cdots+u-1)(u^{12}+3u^{11}+\cdots+12u+9)$
c_8, c_9	$(u+1)(u^2-u-1)^2(u^6+u^5-u^4-2u^3+u+1)^2$ $\cdot(u^{12}+2u^{11}+\cdots+7u-4)$
c_{11}	$(u-1)(u^2+u-1)^2(u^6+u^5-u^4-2u^3+u+1)^2$ $\cdot(u^{12}+2u^{11}+\cdots+7u-4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_6, c_7	$(y-1)(y+1)^4(y^{12}+11y^{11}+\cdots+432y+81)$ $\cdot(y^{12}+15y^{11}+\cdots-7y+1)$
c_2	$((y-1)^5)(y^{12}-37y^{11}+\cdots-75y+1)$ $\cdot(y^{12}-21y^{11}+\cdots-8100y+6561)$
c_5, c_{10}	$y(y^2+3y+1)^2(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^2$ $\cdot(y^{12}+3y^{11}+\cdots-180y+64)$
c_8, c_9, c_{11}	$(y-1)(y^2-3y+1)^2(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^2$ $\cdot(y^{12}-10y^{11}+\cdots-65y+16)$