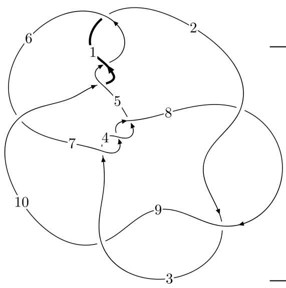
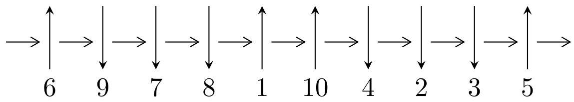
10_{64} $(K10a_{122})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I^u_1 &= \langle b - u,\ -u^{10} - u^9 + 6u^8 + 5u^7 - 12u^6 - 6u^5 + 7u^4 - 4u^3 + u^2 + 2a + 6u + 1,\\
&\quad u^{12} + u^{11} - 7u^{10} - 6u^9 + 18u^8 + 11u^7 - 19u^6 - 2u^5 + 6u^4 - 8u^3 + 1\rangle\\
I^u_2 &= \langle -79u^{15} - 74u^{14} + \cdots + 47b - 143,\ 126u^{15} + 121u^{14} + \cdots + 47a + 425,\ u^{16} + u^{15} + \cdots + 6u - 1\rangle\\
I^u_3 &= \langle b + 1,\ a,\ u - 1\rangle\\
I^u_4 &= \langle b - 1,\ a^2 - 2,\ u + 1\rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 31 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. $\boldsymbol{I_1^u = \langle b - u,\ -u^{10} - u^9 + \cdots + 2a + 1,\ u^{12} + u^{11} + \cdots - 8u^3 + 1\rangle}$

(i) Arc colorings

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

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

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

$$a_8 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{2}u^{10} + \frac{1}{2}u^9 + \cdots - 3u - \frac{1}{2} \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{2}u^{11} - \frac{7}{2}u^9 + \cdots - \frac{1}{2}u - \frac{1}{2} \\ -\frac{1}{2}u^{10} - \frac{1}{2}u^9 + \cdots + u + \frac{1}{2} \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} -\frac{1}{2}u^{11} - \frac{1}{2}u^{10} + \cdots + \frac{1}{2}u + 1 \\ -u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u^{10} + \frac{1}{2}u^9 + \cdots - 2u - \frac{1}{2} \\ -\frac{1}{2}u^{10} + \frac{1}{2}u^9 + \cdots + u + \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -2u^{11} - u^{10} + 15u^9 + 4u^8 - 41u^7 + 2u^6 + 46u^5 - 25u^4 - 14u^3 + 23u^2 - 4u - 1$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_{10}	$u^{12} + 3u^{11} + \cdots + 2u - 2$
c_2, c_3, c_4 c_7, c_8, c_9	$u^{12} + u^{11} - 7u^{10} - 6u^9 + 18u^8 + 11u^7 - 19u^6 - 2u^5 + 6u^4 - 8u^3 + 1$
c_6	$u^{12} - 9u^{11} + \cdots + 102u - 22$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_{10}	$y^{12} - 11y^{11} + \cdots + 20y + 4$
c_2, c_3, c_4 c_7, c_8, c_9	$y^{12} - 15y^{11} + \cdots + 12y^2 + 1$
c_6	$y^{12} + y^{11} + \cdots + 1300y + 484$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.298602 + 0.646764I$ $a = -0.45214 - 1.66459I$ $b = 0.298602 + 0.646764I$	$4.65271 - 3.28049I$	$2.99435 + 5.25300I$
$u = 0.298602 - 0.646764I$ $a = -0.45214 + 1.66459I$ $b = 0.298602 - 0.646764I$	$4.65271 + 3.28049I$	$2.99435 - 5.25300I$
$u = 1.37505$ $a = 1.71226$ $b = 1.37505$	-1.04846	-6.10990
$u = 0.527999$ $a = -1.99219$ $b = 0.527999$	3.24831	0.826740
$u = -1.50349 + 0.33368I$ $a = -0.268985 - 1.300570I$ $b = -1.50349 + 0.33368I$	$-7.04968 + 10.86810I$	$-5.35737 - 5.74032I$
$u = -1.50349 - 0.33368I$ $a = -0.268985 + 1.300570I$ $b = -1.50349 - 0.33368I$	$-7.04968 - 10.86810I$	$-5.35737 + 5.74032I$
$u = -1.54202 + 0.13644I$ $a = -0.585241 - 0.594215I$ $b = -1.54202 + 0.13644I$	$-10.10900 + 1.20346I$	$-7.47592 + 0.43067I$
$u = -1.54202 - 0.13644I$ $a = -0.585241 + 0.594215I$ $b = -1.54202 - 0.13644I$	$-10.10900 - 1.20346I$	$-7.47592 - 0.43067I$
$u = -0.245576 + 0.368193I$ $a = 0.577777 - 1.108910I$ $b = -0.245576 + 0.368193I$	$-0.111574 + 0.933771I$	$-2.28396 - 7.38290I$
$u = -0.245576 - 0.368193I$ $a = 0.577777 + 1.108910I$ $b = -0.245576 - 0.368193I$	$-0.111574 - 0.933771I$	$-2.28396 + 7.38290I$

	Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$1.54096 + 0.25161I$		
$a =$	$0.368549 - 0.997077I$	$-12.33390 - 6.28413I$	$-9.23554 + 3.97965I$
$b =$	$1.54096 + 0.25161I$		
$u =$	$1.54096 - 0.25161I$		
$a =$	$0.368549 + 0.997077I$	$-12.33390 + 6.28413I$	$-9.23554 - 3.97965I$
$b =$	$1.54096 - 0.25161I$		

II. $I_2^u = \langle -79u^{15} - 74u^{14} + \cdots + 47b - 143,\ 126u^{15} + 121u^{14} + \cdots + 47a + 425,\ u^{16} + u^{15} + \cdots + 6u - 1\rangle$

(i) Arc colorings

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

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

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

$$a_8 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -2.68085u^{15} - 2.57447u^{14} + \cdots + 14.1277u - 9.04255 \\ 1.68085u^{15} + 1.57447u^{14} + \cdots - 8.12766u + 3.04255 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -3.06383u^{15} - 4.08511u^{14} + \cdots + 23.5745u - 12.1915 \\ 0.382979u^{15} + 1.51064u^{14} + \cdots - 8.44681u + 3.14894 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^{15} - u^{14} + \cdots + 6u - 6 \\ 1.68085u^{15} + 1.57447u^{14} + \cdots - 8.12766u + 3.04255 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 3.04255u^{15} + 4.72340u^{14} + \cdots - 26.3830u + 11.1277 \\ -0.106383u^{15} + 1.19149u^{14} + \cdots - 7.04255u + 0.680851 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -1.14894u^{15} - 1.53191u^{14} + \cdots + 10.3404u - 6.44681 \\ 2.04255u^{15} + 2.72340u^{14} + \cdots - 12.3830u + 4.12766 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{4}{47}u^{15} + \frac{120}{47}u^{14} + \frac{64}{47}u^{13} - \frac{652}{47}u^{12} + \frac{36}{47}u^{11} + 28u^{10} - \frac{856}{47}u^9 - \frac{1120}{47}u^8 + \frac{1372}{47}u^7 + \frac{364}{47}u^6 - \frac{708}{47}u^5 - \frac{456}{47}u^4 + \frac{928}{47}u^3 + \frac{412}{47}u^2 - \frac{904}{47}u + \frac{270}{47}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_{10}	$(u^8 - u^7 - 3u^6 + 2u^5 + 3u^4 - 2u - 1)^2$
c_2, c_3, c_4 c_7, c_8, c_9	$u^{16} + u^{15} + \cdots + 6u - 1$
c_6	$(u^8 + 3u^7 + 7u^6 + 10u^5 + 11u^4 + 10u^3 + 6u^2 + 4u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_{10}	$(y^8 - 7y^7 + 19y^6 - 22y^5 + 3y^4 + 14y^3 - 6y^2 - 4y + 1)^2$
c_2, c_3, c_4 c_7, c_8, c_9	$y^{16} - 13y^{15} + \cdots - 24y + 1$
c_6	$(y^8 + 5y^7 + 11y^6 + 6y^5 - 17y^4 - 34y^3 - 22y^2 - 4y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.396638 + 0.883588I$ $a = 1.00561 + 1.17006I$ $b = -1.42845 - 0.22812I$	$-0.91019 - 6.44354I$	$-2.57155 + 5.29417I$
$u = 0.396638 - 0.883588I$ $a = 1.00561 - 1.17006I$ $b = -1.42845 + 0.22812I$	$-0.91019 + 6.44354I$	$-2.57155 - 5.29417I$
$u = 0.825972 + 0.646815I$ $a = 0.646365 + 0.503837I$ $b = -1.396840 + 0.083857I$	$-2.24921 + 1.13123I$	$-4.58478 - 0.51079I$
$u = 0.825972 - 0.646815I$ $a = 0.646365 - 0.503837I$ $b = -1.396840 - 0.083857I$	$-2.24921 - 1.13123I$	$-4.58478 + 0.51079I$
$u = -0.558144 + 0.766237I$ $a = -0.792286 + 0.953005I$ $b = 1.41338 - 0.10034I$	$-5.44928 + 2.57849I$	$-7.72292 - 3.56796I$
$u = -0.558144 - 0.766237I$ $a = -0.792286 - 0.953005I$ $b = 1.41338 + 0.10034I$	$-5.44928 - 2.57849I$	$-7.72292 + 3.56796I$
$u = 0.858124$ $a = -1.40539$ $b = 0.240055$	3.21286	1.86400
$u = -1.15431$ $a = 0.315320$ $b = 0.551002$	-2.44483	-0.105540
$u = -1.396840 + 0.083857I$ $a = -0.112641 - 0.603991I$ $b = 0.825972 + 0.646815I$	$-2.24921 + 1.13123I$	$-4.58478 - 0.51079I$
$u = -1.396840 - 0.083857I$ $a = -0.112641 + 0.603991I$ $b = 0.825972 - 0.646815I$	$-2.24921 - 1.13123I$	$-4.58478 + 0.51079I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.41338 + 0.10034I$ $a = -0.145831 + 0.816217I$ $b = -0.558144 - 0.766237I$	$-5.44928 - 2.57849I$	$-7.72292 + 3.56796I$
$u = 1.41338 - 0.10034I$ $a = -0.145831 - 0.816217I$ $b = -0.558144 + 0.766237I$	$-5.44928 + 2.57849I$	$-7.72292 - 3.56796I$
$u = -1.42845 + 0.22812I$ $a = 0.286014 + 0.992605I$ $b = 0.396638 - 0.883588I$	$-0.91019 + 6.44354I$	$-2.57155 - 5.29417I$
$u = -1.42845 - 0.22812I$ $a = 0.286014 - 0.992605I$ $b = 0.396638 + 0.883588I$	$-0.91019 - 6.44354I$	$-2.57155 + 5.29417I$
$u = 0.551002$ $a = -0.660569$ $b = -1.15431$	-2.44483	-0.105540
$u = 0.240055$ $a = -5.02383$ $b = 0.858124$	3.21286	1.86400

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0$ $b = -1.00000$	-3.28987	-12.0000

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

(i) Arc colorings

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

$$a_7 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

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

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

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

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

$$a_9 = \begin{pmatrix} a+1 \\ 1 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} a \\ -a+1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = 1.41421$ $b = 1.00000$	1.64493	−4.00000
$u = -1.00000$ $a = -1.41421$ $b = 1.00000$	1.64493	−4.00000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5, c_{10}	$u(u^2-2)(u^8-u^7-3u^6+2u^5+3u^4-2u-1)^2$ $\cdot(u^{12}+3u^{11}+\cdots+2u-2)$
c_2, c_7	$(u-1)^2(u+1)$ $\cdot(u^{12}+u^{11}-7u^{10}-6u^9+18u^8+11u^7-19u^6-2u^5+6u^4-8u^3+1)$ $\cdot(u^{16}+u^{15}+\cdots+6u-1)$
c_3, c_4, c_8 c_9	$(u-1)(u+1)^2$ $\cdot(u^{12}+u^{11}-7u^{10}-6u^9+18u^8+11u^7-19u^6-2u^5+6u^4-8u^3+1)$ $\cdot(u^{16}+u^{15}+\cdots+6u-1)$
c_6	$u(u^2-2)(u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1)^2$ $\cdot(u^{12}-9u^{11}+\cdots+102u-22)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_{10}	$y(y-2)^2(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)^2$ $\cdot(y^{12}-11y^{11}+\cdots+20y+4)$
c_2, c_3, c_4 c_7, c_8, c_9	$((y-1)^3)(y^{12}-15y^{11}+\cdots+12y^2+1)(y^{16}-13y^{15}+\cdots-24y+1)$
c_6	$y(y-2)^2(y^8+5y^7+11y^6+6y^5-17y^4-34y^3-22y^2-4y+1)^2$ $\cdot(y^{12}+y^{11}+\cdots+1300y+484)$