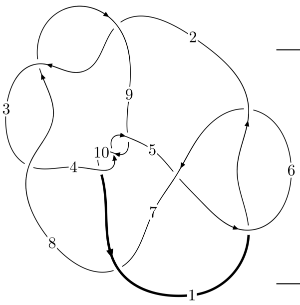
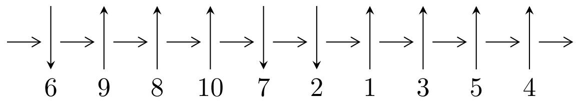
10_{68} $(K10a_{67})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &-u^{11} + u^{10} - 7u^9 + 6u^8 - 17u^7 + 12u^6 - 15u^5 + 7u^4 - 3u^3 - u^2 + 2b - 3u + 1, \\
&- u^{13} + u^{12} - 10u^{11} + 9u^{10} - 36u^9 + 30u^8 - 54u^7 + 43u^6 - 22u^5 + 20u^4 + 10u^3 - 2u^2 + 4a - 3u + 3, \\
&u^{14} + 9u^{12} + u^{11} + 31u^{10} + 6u^9 + 48u^8 + 11u^7 + 27u^6 + 2u^5 - 2u^4 - 8u^3 + u^2 + 1\rangle \\
I_2^u = \langle &4802u^{17} - 8268u^{16} + \cdots + 12107b + 16224,\ -1848u^{17} - 4160u^{16} + \cdots + 12107a - 35011, \\
&u^{18} - u^{17} + \cdots + 6u + 1\rangle \\
I_3^u = \langle &-au + 2b - a - 2u,\ a^2 + au + a + 2u,\ u^2 + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 36 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.

$$\boldsymbol{I_1^u = \langle -u^{11}+u^{10}+\cdots+2b+1,\ -u^{13}+u^{12}+\cdots+4a+3,\ u^{14}+9u^{12}+\cdots+u^2+1\rangle}$$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{4}u^{13} - \frac{1}{4}u^{12} + \cdots + \frac{3}{4}u - \frac{3}{4} \\ \frac{1}{2}u^{11} - \frac{1}{2}u^{10} + \cdots + \frac{3}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{1}{4}u^{13} - \frac{1}{4}u^{12} + \cdots - \frac{3}{4}u - \frac{1}{4} \\ \frac{1}{2}u^{11} - \frac{1}{2}u^{10} + \cdots + \frac{3}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^3 + 2u \\ \frac{1}{4}u^{13} - \frac{1}{4}u^{12} + \cdots + \frac{5}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -1 \\ -\frac{1}{4}u^{13} - \frac{1}{4}u^{12} + \cdots - \frac{1}{4}u - \frac{1}{4} \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ \frac{1}{4}u^{13} - \frac{1}{4}u^{12} + \cdots + \frac{5}{4}u - \frac{1}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -2u^{13} - 17u^{11} - 3u^{10} - 55u^9 - 20u^8 - 79u^7 - 46u^6 - 39u^5 - 33u^4 + 9u^3 + 9u^2 + 7u + 3$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^{14} - 3u^{13} + \cdots - 7u + 2$
c_2, c_3, c_4 c_8, c_9, c_{10}	$u^{14} + 9u^{12} + \cdots + u^2 + 1$
c_5	$u^{14} + 7u^{13} + \cdots + 5u + 4$
c_7	$u^{14} - 9u^{13} + \cdots - 115u + 26$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{14} - 7y^{13} + \cdots - 5y + 4$
c_2, c_3, c_4 c_8, c_9, c_{10}	$y^{14} + 18y^{13} + \cdots + 2y + 1$
c_5	$y^{14} + y^{13} + \cdots + 191y + 16$
c_7	$y^{14} + 5y^{13} + \cdots - 69y + 676$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.552436 + 0.381452I$ $a = 1.22078 - 1.57866I$ $b = 1.041840 + 0.481714I$	$-0.78724 - 4.41668I$	$3.49417 + 7.88625I$
$u = -0.552436 - 0.381452I$ $a = 1.22078 + 1.57866I$ $b = 1.041840 - 0.481714I$	$-0.78724 + 4.41668I$	$3.49417 - 7.88625I$
$u = -0.04509 + 1.43706I$ $a = 0.567049 - 0.433483I$ $b = 0.830389 + 0.784414I$	$-6.78342 - 2.90589I$	$-2.10855 + 2.91897I$
$u = -0.04509 - 1.43706I$ $a = 0.567049 + 0.433483I$ $b = 0.830389 - 0.784414I$	$-6.78342 + 2.90589I$	$-2.10855 - 2.91897I$
$u = 0.498731 + 0.157320I$ $a = -0.611249 - 0.332083I$ $b = 0.400528 + 0.482833I$	$1.035520 + 0.368514I$	$9.33320 - 2.06000I$
$u = 0.498731 - 0.157320I$ $a = -0.611249 + 0.332083I$ $b = 0.400528 - 0.482833I$	$1.035520 - 0.368514I$	$9.33320 + 2.06000I$
$u = -0.164790 + 0.466680I$ $a = -1.43454 + 0.30361I$ $b = -0.941064 + 0.407114I$	$-1.42730 + 1.54478I$	$1.163355 - 0.228482I$
$u = -0.164790 - 0.466680I$ $a = -1.43454 - 0.30361I$ $b = -0.941064 - 0.407114I$	$-1.42730 - 1.54478I$	$1.163355 + 0.228482I$
$u = -0.26550 + 1.53094I$ $a = -0.292054 - 0.268287I$ $b = 0.243278 - 0.917020I$	$-10.58650 - 6.18900I$	$-1.00936 + 2.90508I$
$u = -0.26550 - 1.53094I$ $a = -0.292054 + 0.268287I$ $b = 0.243278 + 0.917020I$	$-10.58650 + 6.18900I$	$-1.00936 - 2.90508I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.33038 + 1.55103I$ $a = 1.76709 + 0.94504I$ $b = 1.211210 - 0.579083I$	$-13.5268 + 11.6370I$	$-3.43423 - 6.31221I$
$u = 0.33038 - 1.55103I$ $a = 1.76709 - 0.94504I$ $b = 1.211210 + 0.579083I$	$-13.5268 - 11.6370I$	$-3.43423 + 6.31221I$
$u = 0.19870 + 1.61232I$ $a = -1.71708 - 0.22802I$ $b = -1.286170 - 0.280982I$	$-15.6273 + 2.2414I$	$-5.43859 - 0.46441I$
$u = 0.19870 - 1.61232I$ $a = -1.71708 + 0.22802I$ $b = -1.286170 + 0.280982I$	$-15.6273 - 2.2414I$	$-5.43859 + 0.46441I$

II. $I_2^u = \langle 4802u^{17} - 8268u^{16} + \cdots + 12107b + 16224,\ -1848u^{17} - 4160u^{16} + \cdots + 12107a - 35011,\ u^{18} - u^{17} + \cdots + 6u + 1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.152639u^{17} + 0.343603u^{16} + \cdots + 0.206988u + 2.89180 \\ -0.396630u^{17} + 0.682911u^{16} + \cdots - 1.61361u - 1.34005 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.549269u^{17} - 0.339308u^{16} + \cdots + 1.82060u + 4.23185 \\ -0.396630u^{17} + 0.682911u^{16} + \cdots - 1.61361u - 1.34005 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0.987528u^{17} - 1.29215u^{16} + \cdots + 7.85430u + 5.72421 \\ -0.579830u^{17} + 0.616833u^{16} + \cdots - 4.42265u - 1.55001 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -1.52119u^{17} + 2.03023u^{16} + \cdots - 18.2674u - 3.39894 \\ 0.275791u^{17} - 0.288263u^{16} + \cdots + 1.53308u - 0.490956 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1.50904u^{17} - 1.78484u^{16} + \cdots + 14.7282u + 7.52119 \\ -0.521516u^{17} + 0.492690u^{16} + \cdots - 4.87387u - 1.79698 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{31900}{12107}u^{17} - \frac{61944}{12107}u^{16} + \cdots + \frac{168364}{12107}u + \frac{112870}{12107}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u^9 + u^8 - 2u^7 - 3u^6 + u^5 + 3u^4 + 2u^3 - u - 1)^2$
c_2, c_3, c_4 c_8, c_9, c_{10}	$u^{18} - u^{17} + \cdots + 6u + 1$
c_5	$(u^9 + 5u^8 + 12u^7 + 15u^6 + 9u^5 - u^4 - 4u^3 - 2u^2 + u + 1)^2$
c_7	$(u^9 + 3u^8 + 8u^7 + 13u^6 + 17u^5 + 17u^4 + 12u^3 + 6u^2 + u - 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)^2$
c_2, c_3, c_4 c_8, c_9, c_{10}	$y^{18} + 15y^{17} + \cdots - 16y + 1$
c_5	$(y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1)^2$
c_7	$(y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.912264 + 0.491243I$ $a = -0.78567 - 1.24878I$ $b = -1.172470 + 0.500383I$	$-6.88799 + 7.08493I$	$-1.57680 - 5.91335I$
$u = 0.912264 - 0.491243I$ $a = -0.78567 + 1.24878I$ $b = -1.172470 - 0.500383I$	$-6.88799 - 7.08493I$	$-1.57680 + 5.91335I$
$u = 0.103396 + 1.069760I$ $a = -0.757195 - 0.604613I$ $b = -0.772920 + 0.510351I$	$-1.50643 + 2.09337I$	$4.51499 - 4.16283I$
$u = 0.103396 - 1.069760I$ $a = -0.757195 + 0.604613I$ $b = -0.772920 - 0.510351I$	$-1.50643 - 2.09337I$	$4.51499 + 4.16283I$
$u = 0.792965 + 0.741615I$ $a = 0.617829 - 0.014310I$ $b = 1.173910 + 0.391555I$	$-7.66122 - 1.33617I$	$-3.28409 + 0.70175I$
$u = 0.792965 - 0.741615I$ $a = 0.617829 + 0.014310I$ $b = 1.173910 - 0.391555I$	$-7.66122 + 1.33617I$	$-3.28409 - 0.70175I$
$u = -0.746849 + 0.515863I$ $a = 0.408531 - 0.597220I$ $b = -0.141484 + 0.739668I$	$-3.90681 - 2.45442I$	$1.67208 + 2.91298I$
$u = -0.746849 - 0.515863I$ $a = 0.408531 + 0.597220I$ $b = -0.141484 - 0.739668I$	$-3.90681 + 2.45442I$	$1.67208 - 2.91298I$
$u = -0.256179 + 1.094020I$ $a = 1.04650 - 1.39689I$ $b = 0.825933$	-4.48831	$-4.65235 + 0.I$
$u = -0.256179 - 1.094020I$ $a = 1.04650 + 1.39689I$ $b = 0.825933$	-4.48831	$-4.65235 + 0.I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.118400 + 1.390980I$ $a = 0.194324 - 0.537825I$ $b = -0.141484 - 0.739668I$	$-3.90681 + 2.45442I$	$1.67208 - 2.91298I$
$u = 0.118400 - 1.390980I$ $a = 0.194324 + 0.537825I$ $b = -0.141484 + 0.739668I$	$-3.90681 - 2.45442I$	$1.67208 + 2.91298I$
$u = 0.00304 + 1.47476I$ $a = 2.29745 + 0.06492I$ $b = 1.173910 - 0.391555I$	$-7.66122 + 1.33617I$	$-3.28409 - 0.70175I$
$u = 0.00304 - 1.47476I$ $a = 2.29745 - 0.06492I$ $b = 1.173910 + 0.391555I$	$-7.66122 - 1.33617I$	$-3.28409 + 0.70175I$
$u = -0.18330 + 1.47754I$ $a = -2.21308 + 0.73195I$ $b = -1.172470 - 0.500383I$	$-6.88799 - 7.08493I$	$-1.57680 + 5.91335I$
$u = -0.18330 - 1.47754I$ $a = -2.21308 - 0.73195I$ $b = -1.172470 + 0.500383I$	$-6.88799 + 7.08493I$	$-1.57680 - 5.91335I$
$u = -0.243739 + 0.102909I$ $a = 3.19131 - 0.41254I$ $b = -0.772920 - 0.510351I$	$-1.50643 - 2.09337I$	$4.51499 + 4.16283I$
$u = -0.243739 - 0.102909I$ $a = 3.19131 + 0.41254I$ $b = -0.772920 + 0.510351I$	$-1.50643 + 2.09337I$	$4.51499 - 4.16283I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2au - 2a - 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = 0.36603 - 1.36603I$ $b = 0.866025 + 0.500000I$	$-3.28987 - 2.02988I$	$-2.00000 + 3.46410I$
$u = 1.000000I$ $a = -1.36603 + 0.36603I$ $b = -0.866025 + 0.500000I$	$-3.28987 + 2.02988I$	$-2.00000 - 3.46410I$
$u = -1.000000I$ $a = 0.36603 + 1.36603I$ $b = 0.866025 - 0.500000I$	$-3.28987 + 2.02988I$	$-2.00000 - 3.46410I$
$u = -1.000000I$ $a = -1.36603 - 0.36603I$ $b = -0.866025 - 0.500000I$	$-3.28987 - 2.02988I$	$-2.00000 + 3.46410I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u^4-u^2+1)(u^9+u^8-2u^7-3u^6+u^5+3u^4+2u^3-u-1)^2$ $\cdot(u^{14}-3u^{13}+\cdots-7u+2)$
c_2, c_3, c_4 c_8, c_9, c_{10}	$((u^2+1)^2)(u^{14}+9u^{12}+\cdots+u^2+1)(u^{18}-u^{17}+\cdots+6u+1)$
c_5	$(u^2-u+1)^2$ $\cdot(u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1)^2$ $\cdot(u^{14}+7u^{13}+\cdots+5u+4)$
c_7	(u^4-u^2+1) $\cdot(u^9+3u^8+8u^7+13u^6+17u^5+17u^4+12u^3+6u^2+u-1)^2$ $\cdot(u^{14}-9u^{13}+\cdots-115u+26)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^2 - y + 1)^2$ $\cdot (y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)^2$ $\cdot (y^{14} - 7y^{13} + \cdots - 5y + 4)$
c_2, c_3, c_4 c_8, c_9, c_{10}	$((y + 1)^4)(y^{14} + 18y^{13} + \cdots + 2y + 1)(y^{18} + 15y^{17} + \cdots - 16y + 1)$
c_5	$(y^2 + y + 1)^2(y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1)^2$ $\cdot (y^{14} + y^{13} + \cdots + 191y + 16)$
c_7	$(y^2 - y + 1)^2$ $\cdot (y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1)^2$ $\cdot (y^{14} + 5y^{13} + \cdots - 69y + 676)$