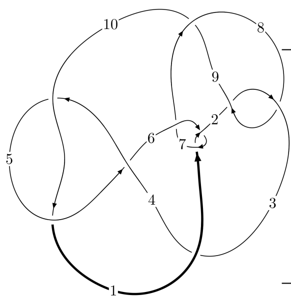
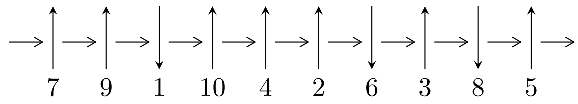
10_{69} $(K10a_{38})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -u^{18} - 3u^{17} + \cdots + b - 3,\ -3u^{18} - 7u^{17} + \cdots + 2a - 7,\ u^{19} + 3u^{18} + \cdots + 7u + 2\rangle \\
I_2^u &= \langle 4u^{13}a - 17u^{13} + \cdots + a + 22,\ 2u^{13}a - 2u^{13} + \cdots - 2a + 2, \\
&\quad u^{14} - u^{13} - 3u^{12} + 4u^{11} + 4u^{10} - 7u^9 - u^8 + 6u^7 - 2u^6 - 2u^5 + 2u^4 - u + 1\rangle \\
I_3^u &= \langle u^3 + b,\ u^2 + a + u - 1,\ u^4 - u^2 + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 51 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. $I_1^u = \langle -u^{18}-3u^{17}+\cdots+b-3,\ -3u^{18}-7u^{17}+\cdots+2a-7,\ u^{19}+3u^{18}+\cdots+7u+2\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^3\\u^5-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}\frac{3}{2}u^{18}+\frac{7}{2}u^{17}+\cdots+\frac{17}{2}u+\frac{7}{2}\\u^{18}+3u^{17}+\cdots+8u+3\end{pmatrix}$$
$$a_7 = \begin{pmatrix}\frac{1}{2}u^{18}+\frac{3}{2}u^{17}+\cdots+\frac{7}{2}u+\frac{3}{2}\\u^{17}+u^{16}+\cdots+2u+1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-\frac{1}{2}u^{18}-\frac{3}{2}u^{17}+\cdots-\frac{7}{2}u-\frac{1}{2}\\-u^{17}-u^{16}+\cdots-3u-1\end{pmatrix}$$
$$a_2 = \begin{pmatrix}\frac{3}{2}u^{18}+\frac{7}{2}u^{17}+\cdots+\frac{17}{2}u+\frac{7}{2}\\-u^{18}-2u^{17}+\cdots-4u-1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 12u^{18}+26u^{17}-24u^{16}-116u^{15}-42u^{14}+200u^{13}+222u^{12}-116u^{11}-334u^{10}-108u^9+228u^8+240u^7-4u^6-172u^5-118u^4+12u^3+78u^2+64u+30$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_6 c_8	$u^{19} + 4u^{17} + \cdots + 2u - 1$
c_3	$u^{19} - 9u^{18} + \cdots + 157u - 22$
c_4, c_{10}	$u^{19} - 3u^{18} + \cdots + 7u - 2$
c_5	$u^{19} - 9u^{18} + \cdots + 5u - 4$
c_7, c_9	$u^{19} + 8u^{18} + \cdots - 2u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$y^{19} + 8y^{18} + \cdots - 2y - 1$
c_3	$y^{19} + 3y^{18} + \cdots + 1461y - 484$
c_4, c_{10}	$y^{19} - 9y^{18} + \cdots + 5y - 4$
c_5	$y^{19} + 3y^{18} + \cdots + 129y - 16$
c_7, c_9	$y^{19} + 12y^{18} + \cdots + 30y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.656620 + 0.736849I$ $a = -0.530916 + 0.111769I$ $b = -0.692991 - 0.514666I$	$-3.87251 - 6.01197I$	$-0.18591 + 7.59122I$
$u = -0.656620 - 0.736849I$ $a = -0.530916 - 0.111769I$ $b = -0.692991 + 0.514666I$	$-3.87251 + 6.01197I$	$-0.18591 - 7.59122I$
$u = 0.833011 + 0.594872I$ $a = 0.493073 - 0.284708I$ $b = 0.042413 + 0.483034I$	$-1.75185 + 2.35707I$	$4.45005 - 4.73717I$
$u = 0.833011 - 0.594872I$ $a = 0.493073 + 0.284708I$ $b = 0.042413 - 0.483034I$	$-1.75185 - 2.35707I$	$4.45005 + 4.73717I$
$u = -0.342490 + 0.822016I$ $a = -0.423303 - 0.244228I$ $b = -0.84616 + 1.72998I$	$-2.12081 + 8.87474I$	$0.63360 - 6.11132I$
$u = -0.342490 - 0.822016I$ $a = -0.423303 + 0.244228I$ $b = -0.84616 - 1.72998I$	$-2.12081 - 8.87474I$	$0.63360 + 6.11132I$
$u = -0.954304 + 0.656562I$ $a = 1.022240 + 0.645581I$ $b = 0.517413 - 0.115037I$	$-2.99077 + 0.72249I$	$1.52455 - 2.82827I$
$u = -0.954304 - 0.656562I$ $a = 1.022240 - 0.645581I$ $b = 0.517413 + 0.115037I$	$-2.99077 - 0.72249I$	$1.52455 + 2.82827I$
$u = 1.178790 + 0.200823I$ $a = 1.12805 + 1.83215I$ $b = -0.06929 + 1.61595I$	$2.86306 - 5.96190I$	$6.84845 + 4.63798I$
$u = 1.178790 - 0.200823I$ $a = 1.12805 - 1.83215I$ $b = -0.06929 - 1.61595I$	$2.86306 + 5.96190I$	$6.84845 - 4.63798I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.160320 + 0.382174I$ $a = -0.30429 - 1.44141I$ $b = 0.996422 - 0.904006I$	$5.16612 + 4.98291I$	$9.41511 - 6.18167I$
$u = 1.160320 - 0.382174I$ $a = -0.30429 + 1.44141I$ $b = 0.996422 + 0.904006I$	$5.16612 - 4.98291I$	$9.41511 + 6.18167I$
$u = -1.141050 + 0.480142I$ $a = 0.96822 - 1.32852I$ $b = -0.00563 - 1.67007I$	$4.50851 - 3.09886I$	$9.38086 + 1.28227I$
$u = -1.141050 - 0.480142I$ $a = 0.96822 + 1.32852I$ $b = -0.00563 + 1.67007I$	$4.50851 + 3.09886I$	$9.38086 - 1.28227I$
$u = -1.143800 + 0.588812I$ $a = -1.12767 + 2.25574I$ $b = 0.96492 + 2.22818I$	$0.26882 - 14.12650I$	$3.54919 + 9.60559I$
$u = -1.143800 - 0.588812I$ $a = -1.12767 - 2.25574I$ $b = 0.96492 - 2.22818I$	$0.26882 + 14.12650I$	$3.54919 - 9.60559I$
$u = -0.085864 + 0.693927I$ $a = 0.667057 + 0.203041I$ $b = -0.176244 - 0.940079I$	$1.57783 - 1.22058I$	$5.73688 + 3.21713I$
$u = -0.085864 - 0.693927I$ $a = 0.667057 - 0.203041I$ $b = -0.176244 + 0.940079I$	$1.57783 + 1.22058I$	$5.73688 - 3.21713I$
$u = -0.695977$ $a = 0.715081$ $b = 0.538288$	0.927841	11.2940

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle 4u^{13}a-17u^{13}+\cdots+a+22,\ 2u^{13}a-2u^{13}+\cdots-2a+2,\ u^{14}-u^{13}+\cdots-u+1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^3\\u^5-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}a\\-0.190476au^{13}+0.809524u^{13}+\cdots-0.0476190a-1.04762\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-0.190476au^{13}-0.190476u^{13}+\cdots+0.952381a-0.0476190\\0.190476au^{13}+0.190476u^{13}+\cdots+0.0476190a-0.952381\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-0.190476au^{13}-0.190476u^{13}+\cdots+0.952381a-0.0476190\\-0.619048au^{13}+0.380952u^{13}+\cdots+0.0952381a-0.904762\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-2u^{13}+7u^{11}-2u^{10}-12u^9+6u^8+8u^7-8u^6+4u^4-3u^3-a+2\\-0.190476au^{13}-0.190476u^{13}+\cdots-0.0476190a+0.952381\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^{13}+16u^{11}-4u^{10}-28u^9+12u^8+20u^7-16u^6+8u^4-8u^3+6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_6 c_8	$u^{28} - u^{27} + \cdots + 2u + 1$
c_3	$(u^{14} + 3u^{13} + \cdots + 7u + 3)^2$
c_4, c_{10}	$(u^{14} + u^{13} + \cdots + u + 1)^2$
c_5	$(u^{14} - 7u^{13} + \cdots - u + 1)^2$
c_7, c_9	$u^{28} + 15u^{27} + \cdots + 10u^2 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$y^{28} + 15y^{27} + \cdots + 10y^2 + 1$
c_3	$(y^{14} + 5y^{13} + \cdots + 23y + 9)^2$
c_4, c_{10}	$(y^{14} - 7y^{13} + \cdots - y + 1)^2$
c_5	$(y^{14} + y^{13} + \cdots + 7y + 1)^2$
c_7, c_9	$y^{28} - 5y^{27} + \cdots + 20y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.989783 + 0.381937I$ $a = 0.75275 - 1.27344I$ $b = 0.090790 - 0.426836I$	$-1.59516 + 1.40484I$	$5.50927 - 0.52948I$
$u = 0.989783 + 0.381937I$ $a = 1.91833 + 1.38556I$ $b = 0.20805 + 2.13390I$	$-1.59516 + 1.40484I$	$5.50927 - 0.52948I$
$u = 0.989783 - 0.381937I$ $a = 0.75275 + 1.27344I$ $b = 0.090790 + 0.426836I$	$-1.59516 - 1.40484I$	$5.50927 + 0.52948I$
$u = 0.989783 - 0.381937I$ $a = 1.91833 - 1.38556I$ $b = 0.20805 - 2.13390I$	$-1.59516 - 1.40484I$	$5.50927 + 0.52948I$
$u = 0.728347 + 0.560551I$ $a = 0.912076 - 0.177857I$ $b = 0.443852 + 0.575052I$	$-1.84948 + 2.19128I$	$2.76081 - 3.85718I$
$u = 0.728347 + 0.560551I$ $a = -0.064777 - 0.599184I$ $b = -0.371682 + 0.254174I$	$-1.84948 + 2.19128I$	$2.76081 - 3.85718I$
$u = 0.728347 - 0.560551I$ $a = 0.912076 + 0.177857I$ $b = 0.443852 - 0.575052I$	$-1.84948 - 2.19128I$	$2.76081 + 3.85718I$
$u = 0.728347 - 0.560551I$ $a = -0.064777 + 0.599184I$ $b = -0.371682 - 0.254174I$	$-1.84948 - 2.19128I$	$2.76081 + 3.85718I$
$u = -1.068410 + 0.522447I$ $a = 1.02538 + 1.04810I$ $b = 0.439782 + 0.298160I$	$-2.72606 - 5.07185I$	$2.32847 + 6.33126I$
$u = -1.068410 + 0.522447I$ $a = -0.47730 + 2.74473I$ $b = 1.89542 + 1.97549I$	$-2.72606 - 5.07185I$	$2.32847 + 6.33126I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.068410-0.522447I$ $a=\ \ 1.02538-1.04810I$ $b=\ \ 0.439782-0.298160I$	$-2.72606+5.07185I$	$2.32847-6.33126I$
$u=-1.068410-0.522447I$ $a=-0.47730-2.74473I$ $b=\ \ 1.89542-1.97549I$	$-2.72606+5.07185I$	$2.32847-6.33126I$
$u=-1.157220+0.286866I$ $a=-0.208422+0.989667I$ $b=\ \ 0.809510+0.540535I$	$4.53640+0.47055I$	$9.32829+0.18349I$
$u=-1.157220+0.286866I$ $a=\ \ 1.17269-1.74006I$ $b=-0.06603-1.71504I$	$4.53640+0.47055I$	$9.32829+0.18349I$
$u=-1.157220-0.286866I$ $a=-0.208422-0.989667I$ $b=\ \ 0.809510-0.540535I$	$4.53640-0.47055I$	$9.32829-0.18349I$
$u=-1.157220-0.286866I$ $a=\ \ 1.17269+1.74006I$ $b=-0.06603+1.71504I$	$4.53640-0.47055I$	$9.32829-0.18349I$
$u=\ \ 0.268039+0.757899I$ $a=\ \ 0.805404-0.051418I$ $b=\ \ 0.148756+0.914884I$	$0.22261-3.62879I$	$3.66617+2.63226I$
$u=\ \ 0.268039+0.757899I$ $a=-0.143310+0.427216I$ $b=-0.80984-1.45942I$	$0.22261-3.62879I$	$3.66617+2.63226I$
$u=\ \ 0.268039-0.757899I$ $a=\ \ 0.805404+0.051418I$ $b=\ \ 0.148756-0.914884I$	$0.22261+3.62879I$	$3.66617-2.63226I$
$u=\ \ 0.268039-0.757899I$ $a=-0.143310-0.427216I$ $b=-0.80984+1.45942I$	$0.22261+3.62879I$	$3.66617-2.63226I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.142590 + 0.546762I$ $a = 0.78194 + 1.24283I$ $b = -0.06519 + 1.60824I$	$2.77434 + 8.53123I$	$6.72348 - 6.18031I$
$u = 1.142590 + 0.546762I$ $a = -0.88693 - 2.21821I$ $b = 1.12473 - 1.96518I$	$2.77434 + 8.53123I$	$6.72348 - 6.18031I$
$u = 1.142590 - 0.546762I$ $a = 0.78194 - 1.24283I$ $b = -0.06519 - 1.60824I$	$2.77434 - 8.53123I$	$6.72348 + 6.18031I$
$u = 1.142590 - 0.546762I$ $a = -0.88693 + 2.21821I$ $b = 1.12473 + 1.96518I$	$2.77434 - 8.53123I$	$6.72348 + 6.18031I$
$u = -0.403136 + 0.584808I$ $a = -1.142350 + 0.668190I$ $b = -0.860151 - 0.151246I$	$-4.65252 + 0.62859I$	$-2.31651 - 1.42251I$
$u = -0.403136 + 0.584808I$ $a = -0.445488 - 1.297380I$ $b = -1.48801 + 1.19980I$	$-4.65252 + 0.62859I$	$-2.31651 - 1.42251I$
$u = -0.403136 - 0.584808I$ $a = -1.142350 - 0.668190I$ $b = -0.860151 + 0.151246I$	$-4.65252 - 0.62859I$	$-2.31651 + 1.42251I$
$u = -0.403136 - 0.584808I$ $a = -0.445488 + 1.297380I$ $b = -1.48801 - 1.19980I$	$-4.65252 - 0.62859I$	$-2.31651 + 1.42251I$

III. $I_3^u = \langle u^3 + b,\ u^2 + a + u - 1,\ u^4 - u^2 + 1\rangle$

(i) Arc colorings

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

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

$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^3 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^2 - u + 1 \\ -u^3 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^3 - u^2 - u + 1 \\ -u^3 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^2 - u + 2 \\ -u^3 + u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^2 + u + 1 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

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

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2, c_6 c_8	$((u^2+1)^2)(u^{19}+4u^{17}+\cdots+2u-1)(u^{28}-u^{27}+\cdots+2u+1)$
c_3	$(u^4-u^2+1)(u^{14}+3u^{13}+\cdots+7u+3)^2(u^{19}-9u^{18}+\cdots+157u-22)$
c_4, c_{10}	$(u^4-u^2+1)(u^{14}+u^{13}+\cdots+u+1)^2(u^{19}-3u^{18}+\cdots+7u-2)$
c_5	$((u^2-u+1)^2)(u^{14}-7u^{13}+\cdots-u+1)^2(u^{19}-9u^{18}+\cdots+5u-4)$
c_7, c_9	$((u+1)^4)(u^{19}+8u^{18}+\cdots-2u-1)(u^{28}+15u^{27}+\cdots+10u^2+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$((y+1)^4)(y^{19}+8y^{18}+\cdots-2y-1)(y^{28}+15y^{27}+\cdots+10y^2+1)$
c_3	$((y^2-y+1)^2)(y^{14}+5y^{13}+\cdots+23y+9)^2$ $\cdot(y^{19}+3y^{18}+\cdots+1461y-484)$
c_4, c_{10}	$((y^2-y+1)^2)(y^{14}-7y^{13}+\cdots-y+1)^2(y^{19}-9y^{18}+\cdots+5y-4)$
c_5	$((y^2+y+1)^2)(y^{14}+y^{13}+\cdots+7y+1)^2$ $\cdot(y^{19}+3y^{18}+\cdots+129y-16)$
c_7, c_9	$((y-1)^4)(y^{19}+12y^{18}+\cdots+30y-1)(y^{28}-5y^{27}+\cdots+20y+1)$