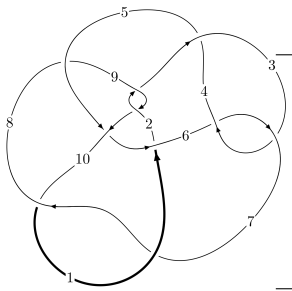
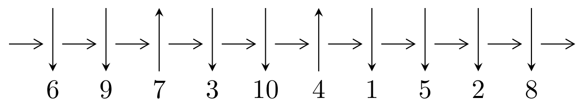
10_{97} $(K10a_{12})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & 2736614u^{16} + 18940720u^{15} + \cdots + 188712037b - 172998039, \\
& 178471267u^{16} + 26934984u^{15} + \cdots + 754848148a + 1554469489, \\
& u^{17} + 3u^{15} + 7u^{13} + u^{12} + 10u^{11} + 2u^{10} + 11u^{9} + 4u^{8} + 22u^{7} - 12u^{6} + 38u^{5} - 21u^{4} + 36u^{3} - 18u^{2} + 17u - \\
I_2^u = \langle & u^{13}a - u^{13} + \cdots + b - 3,\ 2u^{13}a - u^{13} + \cdots + 2a - 5, \\
& u^{14} - u^{13} + 3u^{12} - 2u^{11} + 6u^{10} - 3u^{9} + 7u^{8} - 2u^{7} + 6u^{6} + 4u^{4} + 2u^{2} + u + 1\rangle \\
I_3^u = \langle & b + 1,\ 2a - 2u - 1,\ u^2 + u + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 47 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. $\boldsymbol{I_1^u = \langle 2.74\times10^{6}u^{16} + 1.89\times10^{7}u^{15} + \cdots + 1.89\times10^{8}b - 1.73\times10^{8},\ 1.78\times10^{8}u^{16} + 2.69\times10^{7}u^{15} + \cdots + 7.55\times10^{8}a + 1.55\times10^{9},\ u^{17} + 3u^{15} + \cdots + 17u - 4\rangle}$

(i) Arc colorings

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

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

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

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

$$a_9 = \begin{pmatrix} -0.236433u^{16} - 0.0356827u^{15} + \cdots + 3.37770u - 2.05931 \\ -0.0145015u^{16} - 0.100368u^{15} + \cdots - 1.37842u + 0.916730 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.252945u^{16} + 0.0144309u^{15} + \cdots - 3.32958u + 2.37418 \\ 0.0316855u^{16} + 0.201926u^{15} + \cdots + 2.11952u - 0.917967 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.475929u^{16} + 0.0117484u^{15} + \cdots + 7.44839u - 3.87934 \\ -0.0117484u^{16} - 0.307312u^{15} + \cdots - 4.21145u + 1.90371 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 0.229183u^{16} - 0.0145015u^{15} + \cdots - 3.56691u + 2.51768 \\ -0.0356827u^{16} + 0.0837041u^{15} + \cdots + 1.96005u - 0.945733 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.229492u^{16} + 0.0316855u^{15} + \cdots + 3.85585u - 1.78184 \\ 0.0144309u^{16} - 0.191499u^{15} + \cdots - 1.92588u + 1.01178 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{153304973}{188712037}u^{16} - \frac{89774747}{754848148}u^{15} + \cdots - \frac{9028153643}{754848148}u - \frac{1460399043}{188712037}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_8	$4(4u^{17} + 2u^{16} + \cdots + u^2 + 1)$
c_2, c_7, c_9 c_{10}	$u^{17} + 2u^{16} + \cdots - 2u + 1$
c_3, c_6	$u^{17} + 3u^{15} + \cdots + 17u + 4$
c_4	$u^{17} + 6u^{16} + \cdots + 145u - 16$
c_5	$u^{17} - 3u^{16} + \cdots - 24u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$16(16y^{17} + 132y^{16} + \cdots - 2y - 1)$
c_2, c_7, c_9 c_{10}	$y^{17} + 10y^{16} + \cdots + 8y - 1$
c_3, c_6	$y^{17} + 6y^{16} + \cdots + 145y - 16$
c_4	$y^{17} + 10y^{16} + \cdots + 44449y - 256$
c_5	$y^{17} + 5y^{16} + \cdots - 6976y - 1024$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.417221 + 0.885126I$ $a = -0.476552 + 0.009774I$ $b = -0.222604 + 0.163997I$	$-0.34103 - 1.75255I$	$-2.16634 + 2.85736I$
$u = -0.417221 - 0.885126I$ $a = -0.476552 - 0.009774I$ $b = -0.222604 - 0.163997I$	$-0.34103 + 1.75255I$	$-2.16634 - 2.85736I$
$u = 0.597620 + 0.869356I$ $a = -0.334759 + 0.962950I$ $b = 1.335870 + 0.125893I$	$-1.15632 + 2.35456I$	$2.48228 - 6.50501I$
$u = 0.597620 - 0.869356I$ $a = -0.334759 - 0.962950I$ $b = 1.335870 - 0.125893I$	$-1.15632 - 2.35456I$	$2.48228 + 6.50501I$
$u = 0.236791 + 0.896556I$ $a = 0.903548 + 1.016340I$ $b = 0.840094 - 0.523489I$	$-2.94308 + 1.91475I$	$-12.50863 - 1.23884I$
$u = 0.236791 - 0.896556I$ $a = 0.903548 - 1.016340I$ $b = 0.840094 + 0.523489I$	$-2.94308 - 1.91475I$	$-12.50863 + 1.23884I$
$u = 0.979244 + 0.594888I$ $a = 0.26940 + 1.57950I$ $b = -0.44756 - 1.37873I$	$9.32990 - 8.56729I$	$0.17143 + 4.34513I$
$u = 0.979244 - 0.594888I$ $a = 0.26940 - 1.57950I$ $b = -0.44756 + 1.37873I$	$9.32990 + 8.56729I$	$0.17143 - 4.34513I$
$u = -1.198530 + 0.485201I$ $a = -0.11385 + 1.41682I$ $b = -0.047500 - 1.229640I$	$7.90214 - 1.97950I$	$6.13742 + 2.92595I$
$u = -1.198530 - 0.485201I$ $a = -0.11385 - 1.41682I$ $b = -0.047500 + 1.229640I$	$7.90214 + 1.97950I$	$6.13742 - 2.92595I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.745598 + 1.114110I$ $a = -1.29641 - 1.54585I$ $b = -0.53774 + 1.38258I$	$7.7059 + 14.8527I$	$-2.01529 - 8.44038I$
$u = 0.745598 - 1.114110I$ $a = -1.29641 + 1.54585I$ $b = -0.53774 - 1.38258I$	$7.7059 - 14.8527I$	$-2.01529 + 8.44038I$
$u = -0.203786 + 1.345170I$ $a = -0.540937 + 0.304824I$ $b = -0.347263 - 1.122360I$	$1.26847 - 6.54787I$	$-3.86293 + 7.90993I$
$u = -0.203786 - 1.345170I$ $a = -0.540937 - 0.304824I$ $b = -0.347263 + 1.122360I$	$1.26847 + 6.54787I$	$-3.86293 - 7.90993I$
$u = -0.87723 + 1.18507I$ $a = 0.723215 - 1.188380I$ $b = 0.161092 + 1.190930I$	$5.81019 - 5.32225I$	$2.45956 + 7.34338I$
$u = -0.87723 - 1.18507I$ $a = 0.723215 + 1.188380I$ $b = 0.161092 - 1.190930I$	$5.81019 + 5.32225I$	$2.45956 - 7.34338I$
$u = 0.275016$ $a = -1.51732$ $b = 0.531228$	-0.869406	-11.1450

II.

$$\boldsymbol{I_2^u = \langle u^{13}a - u^{13} + \cdots + b - 3,\ 2u^{13}a - u^{13} + \cdots + 2a - 5,\ u^{14} - u^{13} + \cdots + u + 1 \rangle}$$

(i) Arc colorings

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

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

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

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

$$a_9 = \begin{pmatrix} a \\ -u^{13}a + u^{13} + \cdots - 2u + 3 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} u^{13}a + 6u^{13} + \cdots + 3a + 6 \\ -u^{13}a - u^{13} + \cdots - a + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^{13} + 2u^{11} + 3u^9 + 2u^7 - u \\ -u^{13} + u^{12} - 2u^{11} + 3u^{10} - 3u^9 + 5u^8 - 2u^7 + 6u^6 + 4u^4 + 3u^2 + u + 1 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^{12}a + 3u^{13} + \cdots + 2a + 6 \\ 2u^{13} - 2u^{12} + \cdots - au + 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^{13}a - u^{13} + \cdots - a + 1 \\ -u^{13}a + 2u^{13} + \cdots + a + 4 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -4u^{12} + 4u^{11} - 8u^{10} + 8u^9 - 16u^8 + 12u^7 - 12u^6 + 12u^5 - 8u^4 + 4u^3 - 4u^2 + 8u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_8	$u^{28} - 3u^{27} + \cdots - 1254u + 653$
c_2, c_7, c_9 c_{10}	$u^{28} - 5u^{27} + \cdots - 2u + 1$
c_3, c_5, c_6	$(u^{14} + u^{13} + \cdots - u + 1)^2$
c_4	$(u^{14} + 5u^{13} + \cdots + 3u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$y^{28} + 15y^{27} + \cdots + 3659320y + 426409$
c_2, c_7, c_9 c_{10}	$y^{28} + 19y^{27} + \cdots - 10y^2 + 1$
c_3, c_5, c_6	$(y^{14} + 5y^{13} + \cdots + 3y + 1)^2$
c_4	$(y^{14} + 9y^{13} + \cdots + 15y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.772300 + 0.626535I$ $a = 0.406503 - 0.509972I$ $b = -1.027090 - 0.175615I$	$4.48016 - 3.41271I$	$-1.89400 + 2.62516I$
$u = 0.772300 + 0.626535I$ $a = -0.59492 - 1.65604I$ $b = 0.41210 + 1.42136I$	$4.48016 - 3.41271I$	$-1.89400 + 2.62516I$
$u = 0.772300 - 0.626535I$ $a = 0.406503 + 0.509972I$ $b = -1.027090 + 0.175615I$	$4.48016 + 3.41271I$	$-1.89400 - 2.62516I$
$u = 0.772300 - 0.626535I$ $a = -0.59492 + 1.65604I$ $b = 0.41210 - 1.42136I$	$4.48016 + 3.41271I$	$-1.89400 - 2.62516I$
$u = -0.050221 + 1.076790I$ $a = -0.752996 - 0.510112I$ $b = -0.637817 + 0.252286I$	$-1.35286 - 2.76747I$	$-9.41762 + 3.21377I$
$u = -0.050221 + 1.076790I$ $a = 0.315982 + 0.198126I$ $b = 0.426047 + 1.000290I$	$-1.35286 - 2.76747I$	$-9.41762 + 3.21377I$
$u = -0.050221 - 1.076790I$ $a = -0.752996 + 0.510112I$ $b = -0.637817 - 0.252286I$	$-1.35286 + 2.76747I$	$-9.41762 - 3.21377I$
$u = -0.050221 - 1.076790I$ $a = 0.315982 - 0.198126I$ $b = 0.426047 - 1.000290I$	$-1.35286 + 2.76747I$	$-9.41762 - 3.21377I$
$u = 0.727524 + 0.860849I$ $a = 0.715949 + 1.174200I$ $b = -0.51211 - 1.46812I$	$7.93259 + 2.76747I$	$1.41762 - 3.21377I$
$u = 0.727524 + 0.860849I$ $a = -1.19732 - 1.74297I$ $b = -0.64484 + 1.35997I$	$7.93259 + 2.76747I$	$1.41762 - 3.21377I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.727524 - 0.860849I$ $a = 0.715949 - 1.174200I$ $b = -0.51211 + 1.46812I$	$7.93259 - 2.76747I$	$1.41762 + 3.21377I$
$u = 0.727524 - 0.860849I$ $a = -1.19732 + 1.74297I$ $b = -0.64484 - 1.35997I$	$7.93259 - 2.76747I$	$1.41762 + 3.21377I$
$u = -0.494052 + 0.663856I$ $a = 0.96368 - 1.66194I$ $b = 0.053811 - 0.680241I$	$3.26705 - 1.37770I$	$-4.88590 + 4.12207I$
$u = -0.494052 + 0.663856I$ $a = -0.95490 - 2.71701I$ $b = 0.006983 + 1.150230I$	$3.26705 - 1.37770I$	$-4.88590 + 4.12207I$
$u = -0.494052 - 0.663856I$ $a = 0.96368 + 1.66194I$ $b = 0.053811 + 0.680241I$	$3.26705 + 1.37770I$	$-4.88590 - 4.12207I$
$u = -0.494052 - 0.663856I$ $a = -0.95490 + 2.71701I$ $b = 0.006983 - 1.150230I$	$3.26705 + 1.37770I$	$-4.88590 - 4.12207I$
$u = -0.622207 + 1.001070I$ $a = 0.372140 + 0.404462I$ $b = 0.340282 + 0.137082I$	$2.09958 - 3.41271I$	$-6.10600 + 2.62516I$
$u = -0.622207 + 1.001070I$ $a = -1.58493 + 1.41489I$ $b = -0.136381 - 1.104830I$	$2.09958 - 3.41271I$	$-6.10600 + 2.62516I$
$u = -0.622207 - 1.001070I$ $a = 0.372140 - 0.404462I$ $b = 0.340282 - 0.137082I$	$2.09958 + 3.41271I$	$-6.10600 - 2.62516I$
$u = -0.622207 - 1.001070I$ $a = -1.58493 - 1.41489I$ $b = -0.136381 + 1.104830I$	$2.09958 + 3.41271I$	$-6.10600 - 2.62516I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.683715 + 1.025590I$ $a = 0.010710 - 0.783806I$ $b = -1.148810 + 0.016311I$	$3.28987 + 8.93586I$	$-4.00000 - 7.26077I$
$u = 0.683715 + 1.025590I$ $a = 1.32082 + 1.63940I$ $b = 0.56444 - 1.41873I$	$3.28987 + 8.93586I$	$-4.00000 - 7.26077I$
$u = 0.683715 - 1.025590I$ $a = 0.010710 + 0.783806I$ $b = -1.148810 - 0.016311I$	$3.28987 - 8.93586I$	$-4.00000 + 7.26077I$
$u = 0.683715 - 1.025590I$ $a = 1.32082 - 1.63940I$ $b = 0.56444 + 1.41873I$	$3.28987 - 8.93586I$	$-4.00000 + 7.26077I$
$u = -0.517057 + 0.454483I$ $a = -0.163546 - 1.319840I$ $b = -0.212363 - 0.520130I$	$3.31269 - 1.37770I$	$-3.11410 + 4.12207I$
$u = -0.517057 + 0.454483I$ $a = -0.85718 - 1.74842I$ $b = 0.015745 + 1.176090I$	$3.31269 - 1.37770I$	$-3.11410 + 4.12207I$
$u = -0.517057 - 0.454483I$ $a = -0.163546 + 1.319840I$ $b = -0.212363 + 0.520130I$	$3.31269 + 1.37770I$	$-3.11410 - 4.12207I$
$u = -0.517057 - 0.454483I$ $a = -0.85718 + 1.74842I$ $b = 0.015745 - 1.176090I$	$3.31269 + 1.37770I$	$-3.11410 - 4.12207I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{1}{4}u - 10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$16(16y^2 + 4y + 1)$
c_2, c_7, c_9 c_{10}	$(y-1)^2$
c_3, c_4, c_6	$y^2 + y + 1$
c_5	y^2

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = 0.866025I$ $b = -1.00000$	$-1.64493 - 2.02988I$	$-10.12500 + 0.21651I$
$u = -0.500000 - 0.866025I$ $a = - 0.866025I$ $b = -1.00000$	$-1.64493 + 2.02988I$	$-10.12500 - 0.21651I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$16(4u^2-2u+1)(4u^{17}+2u^{16}+\cdots+u^2+1)$ $\cdot(u^{28}-3u^{27}+\cdots-1254u+653)$
c_2,c_{10}	$((u+1)^2)(u^{17}+2u^{16}+\cdots-2u+1)(u^{28}-5u^{27}+\cdots-2u+1)$
c_3	$(u^2+u+1)(u^{14}+u^{13}+\cdots-u+1)^2(u^{17}+3u^{15}+\cdots+17u+4)$
c_4	$(u^2+u+1)(u^{14}+5u^{13}+\cdots+3u+1)^2(u^{17}+6u^{16}+\cdots+145u-16)$
c_5	$u^2(u^{14}+u^{13}+\cdots-u+1)^2(u^{17}-3u^{16}+\cdots-24u+32)$
c_6	$(u^2-u+1)(u^{14}+u^{13}+\cdots-u+1)^2(u^{17}+3u^{15}+\cdots+17u+4)$
c_7,c_9	$((u-1)^2)(u^{17}+2u^{16}+\cdots-2u+1)(u^{28}-5u^{27}+\cdots-2u+1)$
c_8	$16(4u^2+2u+1)(4u^{17}+2u^{16}+\cdots+u^2+1)$ $\cdot(u^{28}-3u^{27}+\cdots-1254u+653)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_8	$256(16y^2+4y+1)(16y^{17}+132y^{16}+\cdots-2y-1)$ $\cdot(y^{28}+15y^{27}+\cdots+3659320y+426409)$
c_2, c_7, c_9 c_{10}	$((y-1)^2)(y^{17}+10y^{16}+\cdots+8y-1)(y^{28}+19y^{27}+\cdots-10y^2+1)$
c_3, c_6	$(y^2+y+1)(y^{14}+5y^{13}+\cdots+3y+1)^2(y^{17}+6y^{16}+\cdots+145y-16)$
c_4	$(y^2+y+1)(y^{14}+9y^{13}+\cdots+15y+1)^2$ $\cdot(y^{17}+10y^{16}+\cdots+44449y-256)$
c_5	$y^2(y^{14}+5y^{13}+\cdots+3y+1)^2(y^{17}+5y^{16}+\cdots-6976y-1024)$