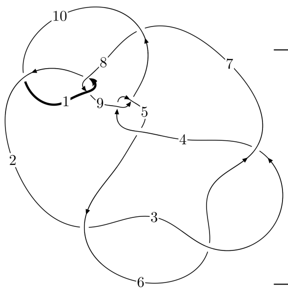
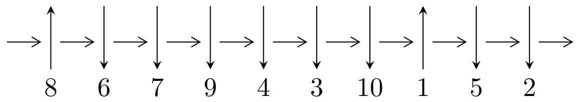
10_{72} $(K10a_4)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u &= \langle u^{37} - 2u^{36} + \cdots + 2b + 1,\ -u^{12} + 5u^{10} + 2u^9 - 9u^8 - 8u^7 + 4u^6 + 10u^5 + 6u^4 - 2u^3 - 5u^2 + a - 2u - 1, \\ &\quad u^{38} - 3u^{37} + \cdots + 2u - 1 \rangle \\ I_2^u &= \langle b^2 - b + 1,\ a + 1,\ u - 1 \rangle \end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 40 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.

$$I_1^u = \langle u^{37}-2u^{36}+\cdots+2b+1,\ -u^{12}+5u^{10}+\cdots+a-1,\ u^{38}-3u^{37}+\cdots+2u-1\rangle$$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^{12}-5u^{10}-2u^9+9u^8+8u^7-4u^6-10u^5-6u^4+2u^3+5u^2+2u+1\\-\frac{1}{2}u^{37}+u^{36}+\cdots+\frac{5}{2}u-\frac{1}{2}\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-\frac{1}{2}u^{37}+u^{36}+\cdots+\frac{5}{2}u+\frac{1}{2}\\\frac{5}{2}u^{37}-4u^{36}+\cdots-\frac{5}{2}u+\frac{3}{2}\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u^5-2u^3+u\\u^7-3u^5+2u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}2u^{37}-3u^{36}+\cdots+10u^2+2\\\frac{5}{2}u^{37}-4u^{36}+\cdots-\frac{5}{2}u+\frac{3}{2}\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-3u^{37}+5u^{36}+\cdots+5u-2\\\frac{3}{2}u^{37}-2u^{36}+\cdots-\frac{1}{2}u+\frac{1}{2}\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -2u^{37}-u^{36}+35u^{35}+21u^{34}-270u^{33}-205u^{32}+1194u^{31}+1182u^{30}-3222u^{29}-4364u^{28}+4873u^{27}+10507u^{26}-1460u^{25}-15693u^{24}-9964u^{23}+11016u^{22}+21182u^{21}+5747u^{20}-16959u^{19}-19349u^{18}-2018u^{17}+13493u^{16}+13726u^{15}+2674u^{14}-6790u^{13}-7586u^{12}-3020u^{11}+1300u^{10}+2786u^9+1852u^8+442u^7-314u^6-448u^5-263u^4-91u^3-25u^2+4u-5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_8	$u^{38} + 2u^{37} + \cdots + 5u + 1$
c_2, c_3, c_6	$u^{38} - 3u^{37} + \cdots + 2u - 1$
c_4, c_9	$u^{38} - u^{37} + \cdots - 4u - 4$
c_5	$u^{38} + 15u^{37} + \cdots + 72u + 16$
c_7	$u^{38} - 2u^{37} + \cdots - 37u + 17$
c_{10}	$u^{38} + 18u^{37} + \cdots - 5u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$y^{38} + 18y^{37} + \cdots - 5y + 1$
c_2, c_3, c_6	$y^{38} - 33y^{37} + \cdots - 8y + 1$
c_4, c_9	$y^{38} - 15y^{37} + \cdots - 72y + 16$
c_5	$y^{38} + 13y^{37} + \cdots - 2848y + 256$
c_7	$y^{38} - 6y^{37} + \cdots - 6333y + 289$
c_{10}	$y^{38} + 6y^{37} + \cdots - 61y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.000620+0.466336I$		
$a=\ \ 0.694761-0.337574I$	$-2.40471-3.95746I$	$-10.27520+4.57056I$
$b=-0.527298+1.065360I$		
$u=-1.000620-0.466336I$		
$a=\ \ 0.694761+0.337574I$	$-2.40471+3.95746I$	$-10.27520-4.57056I$
$b=-0.527298-1.065360I$		
$u=-1.062270+0.332916I$		
$a=\ \ 1.252160-0.030949I$	$-0.568983+0.479860I$	$-6.06539+0.48126I$
$b=-0.570085-0.447308I$		
$u=-1.062270-0.332916I$		
$a=\ \ 1.252160+0.030949I$	$-0.568983-0.479860I$	$-6.06539-0.48126I$
$b=-0.570085+0.447308I$		
$u=-0.719303+0.499357I$		
$a=\ \ 1.44677-0.15075I$	$-3.54227+2.75914I$	$-13.19764-4.35912I$
$b=-0.362704-1.048010I$		
$u=-0.719303-0.499357I$		
$a=\ \ 1.44677+0.15075I$	$-3.54227-2.75914I$	$-13.19764+4.35912I$
$b=-0.362704+1.048010I$		
$u=-0.214521+0.842165I$		
$a=\ \ 2.14112+0.49356I$	$0.00579+8.62980I$	$-6.60829-7.80256I$
$b=-0.573770-1.100590I$		
$u=-0.214521-0.842165I$		
$a=\ \ 2.14112-0.49356I$	$0.00579-8.62980I$	$-6.60829+7.80256I$
$b=-0.573770+1.100590I$		
$u=-0.174468+0.788088I$		
$a=\ \ 1.39685-0.95450I$	$2.09675+3.65224I$	$-3.04639-3.74887I$
$b=-0.731729+0.388434I$		
$u=-0.174468-0.788088I$		
$a=\ \ 1.39685+0.95450I$	$2.09675-3.65224I$	$-3.04639+3.74887I$
$b=-0.731729-0.388434I$		

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.317784 + 0.691757I$ $a = 0.058360 - 0.565761I$ $b = -0.214760 + 1.058960I$	$-2.35641 + 1.43399I$	$-10.35352 - 2.88902I$
$u = -0.317784 - 0.691757I$ $a = 0.058360 + 0.565761I$ $b = -0.214760 - 1.058960I$	$-2.35641 - 1.43399I$	$-10.35352 + 2.88902I$
$u = 1.251800 + 0.201783I$ $a = -0.999363 - 0.281232I$ $b = 0.652278 + 0.954226I$	$-2.15443 + 0.39089I$	$-9.84825 + 1.14697I$
$u = 1.251800 - 0.201783I$ $a = -0.999363 + 0.281232I$ $b = 0.652278 - 0.954226I$	$-2.15443 - 0.39089I$	$-9.84825 - 1.14697I$
$u = -1.260340 + 0.253559I$ $a = -0.003037 + 0.946509I$ $b = 0.662945 - 0.361405I$	$-1.02515 + 1.90334I$	$-5.81979 - 1.07076I$
$u = -1.260340 - 0.253559I$ $a = -0.003037 - 0.946509I$ $b = 0.662945 + 0.361405I$	$-1.02515 - 1.90334I$	$-5.81979 + 1.07076I$
$u = 1.284790 + 0.261207I$ $a = -1.278000 + 0.104536I$ $b = 0.731652 - 0.644131I$	$-1.23963 - 4.86305I$	$-7.46881 + 6.13263I$
$u = 1.284790 - 0.261207I$ $a = -1.278000 - 0.104536I$ $b = 0.731652 + 0.644131I$	$-1.23963 + 4.86305I$	$-7.46881 - 6.13263I$
$u = -0.016707 + 0.678781I$ $a = -1.38023 - 1.35662I$ $b = 0.666801 + 0.530991I$	$2.80379 + 1.46931I$	$-1.12935 - 3.08473I$
$u = -0.016707 - 0.678781I$ $a = -1.38023 + 1.35662I$ $b = 0.666801 - 0.530991I$	$2.80379 - 1.46931I$	$-1.12935 + 3.08473I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.315510 + 0.121395I$ $a = 0.61655 - 1.44009I$ $b = 0.291142 - 1.061280I$	$-4.89567 - 0.49664I$	$-12.27278 + 1.11503I$
$u = -1.315510 - 0.121395I$ $a = 0.61655 + 1.44009I$ $b = 0.291142 + 1.061280I$	$-4.89567 + 0.49664I$	$-12.27278 - 1.11503I$
$u = -1.329280 + 0.259672I$ $a = -1.99856 + 1.39234I$ $b = 0.547737 + 1.093970I$	$-3.13917 + 6.61979I$	$-9.45062 - 5.39938I$
$u = -1.329280 - 0.259672I$ $a = -1.99856 - 1.39234I$ $b = 0.547737 - 1.093970I$	$-3.13917 - 6.61979I$	$-9.45062 + 5.39938I$
$u = 0.091958 + 0.636482I$ $a = -2.64958 + 0.37806I$ $b = 0.571517 - 1.023410I$	$1.34864 - 3.34557I$	$-3.46602 + 2.94107I$
$u = 0.091958 - 0.636482I$ $a = -2.64958 - 0.37806I$ $b = 0.571517 + 1.023410I$	$1.34864 + 3.34557I$	$-3.46602 - 2.94107I$
$u = 1.372870 + 0.330158I$ $a = 0.451776 + 0.876637I$ $b = -0.811572 - 0.358412I$	$-2.79986 - 7.69321I$	0
$u = 1.372870 - 0.330158I$ $a = 0.451776 - 0.876637I$ $b = -0.811572 + 0.358412I$	$-2.79986 + 7.69321I$	0
$u = -0.582954$ $a = 0.891810$ $b = -0.340706$	-0.970134	-9.92360
$u = 1.42045$ $a = 0.242047$ $b = -0.758415$	-7.33419	-11.4900

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.40646+0.27352I$ $a = -0.517124-0.625628I$ $b = -0.183991-1.166970I$	$-7.80695-4.93169I$	0
$u = 1.40646-0.27352I$ $a = -0.517124+0.625628I$ $b = -0.183991+1.166970I$	$-7.80695+4.93169I$	0
$u = 1.39814+0.35135I$ $a = 1.96262+0.82883I$ $b = -0.591496+1.133850I$	$-5.10692-12.92960I$	0
$u = 1.39814-0.35135I$ $a = 1.96262-0.82883I$ $b = -0.591496-1.133850I$	$-5.10692+12.92960I$	0
$u = 1.47061+0.05198I$ $a = 0.671770+1.172880I$ $b = -0.422515+1.169490I$	$-10.78740-4.17106I$	0
$u = 1.47061-0.05198I$ $a = 0.671770-1.172880I$ $b = -0.422515-1.169490I$	$-10.78740+4.17106I$	0
$u = 0.215436+0.157466I$ $a = 1.56623+0.67273I$ $b = 0.415410+0.878457I$	$-0.33342+1.74546I$	$-2.32569-3.49934I$
$u = 0.215436-0.157466I$ $a = 1.56623-0.67273I$ $b = 0.415410-0.878457I$	$-0.33342-1.74546I$	$-2.32569+3.49934I$

II. $I_2^u = \langle b^2 - b + 1,\ a + 1,\ u - 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4b - 7$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.00000$ $b = 0.500000 + 0.866025I$	$-1.64493 + 2.02988I$	$-9.00000 - 3.46410I$
$u = 1.00000$ $a = -1.00000$ $b = 0.500000 - 0.866025I$	$-1.64493 - 2.02988I$	$-9.00000 + 3.46410I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)(u^{38}+2u^{37}+\cdots+5u+1)$
c_2, c_3	$((u-1)^2)(u^{38}-3u^{37}+\cdots+2u-1)$
c_4, c_9	$u^2(u^{38}-u^{37}+\cdots-4u-4)$
c_5	$u^2(u^{38}+15u^{37}+\cdots+72u+16)$
c_6	$((u+1)^2)(u^{38}-3u^{37}+\cdots+2u-1)$
c_7	$(u^2-u+1)(u^{38}-2u^{37}+\cdots-37u+17)$
c_8	$(u^2+u+1)(u^{38}+2u^{37}+\cdots+5u+1)$
c_{10}	$(u^2-u+1)(u^{38}+18u^{37}+\cdots-5u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_8	$(y^2+y+1)(y^{38}+18y^{37}+\cdots-5y+1)$
c_2, c_3, c_6	$((y-1)^2)(y^{38}-33y^{37}+\cdots-8y+1)$
c_4, c_9	$y^2(y^{38}-15y^{37}+\cdots-72y+16)$
c_5	$y^2(y^{38}+13y^{37}+\cdots-2848y+256)$
c_7	$(y^2+y+1)(y^{38}-6y^{37}+\cdots-6333y+289)$
c_{10}	$(y^2+y+1)(y^{38}+6y^{37}+\cdots-61y+1)$