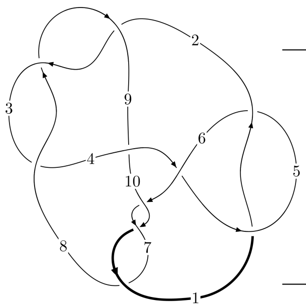
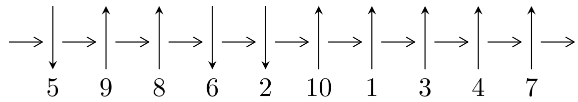
10_{65} $(K10a_{42})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -2u^{24} + 2u^{23} + \cdots + 4b + 2,\ 2u^{24} - u^{23} + \cdots + 4a - 6,\ u^{25} - 2u^{24} + \cdots - 4u + 2\rangle$$
$$I_2^u = \langle -a^2u^2 + u^2a + 2au + b + 2a + 2u,\ -2a^2u^2 + a^3 + 2u^2a - 2a^2 + 3au + 5a + u + 1,\ u^3 + u^2 + 2u + 1\rangle$$
$$I_3^u = \langle b + 1,\ 2a + u + 2,\ u^2 + 2\rangle$$

$$I_1^v = \langle a,\ b - 1,\ v - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 37 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.

$$\boldsymbol{I_1^u = \langle -2u^{24}+2u^{23}+\cdots+4b+2,\ 2u^{24}-u^{23}+\cdots+4a-6,\ u^{25}-2u^{24}+\cdots-4u+2\rangle}$$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-\frac{1}{2}u^{24}+\frac{1}{4}u^{23}+\cdots-2u+\frac{3}{2}\\ \frac{1}{2}u^{24}-\frac{1}{2}u^{23}+\cdots+\frac{3}{2}u-\frac{1}{2}\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-\frac{1}{4}u^{23}-\frac{5}{2}u^{21}+\cdots-\frac{1}{2}u+1\\ \frac{1}{2}u^{24}-\frac{1}{2}u^{23}+\cdots+\frac{3}{2}u-\frac{1}{2}\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-\frac{1}{2}u^{24}+u^{23}+\cdots-3u+\frac{3}{2}\\ \frac{1}{4}u^{22}-\frac{1}{4}u^{21}+\cdots-\frac{1}{2}u-1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u\\u^3+u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}u^2+1\\-u^4-2u^2\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^5+2u^3+u\\-u^7-3u^5-2u^3+u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}\frac{1}{4}u^{18}+2u^{16}+\cdots-\frac{3}{2}u+\frac{1}{2}\\ \frac{1}{2}u^{11}+\frac{5}{2}u^9+\cdots-u^2+u\end{pmatrix}$$

(ii) Obstruction class $=-1$

(iii) Cusp Shapes $=-2u^{24}+4u^{23}-26u^{22}+40u^{21}-138u^{20}+164u^{19}-384u^{18}+346u^{17}-584u^{16}+380u^{15}-430u^{14}+186u^{13}-50u^{12}+32u^{11}+80u^{10}+56u^9-74u^8+110u^7-178u^6+100u^5-82u^4+18u^3+24u^2-14u+8$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{25} + 2u^{24} + \cdots - u - 3$
c_2, c_3, c_8	$u^{25} + 2u^{24} + \cdots - 4u - 2$
c_4	$u^{25} + 10u^{24} + \cdots + 97u + 9$
c_6, c_7, c_{10}	$u^{25} - 2u^{24} + \cdots - 5u - 3$
c_9	$u^{25} - 2u^{24} + \cdots + 56u - 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{25} - 10y^{24} + \cdots + 97y - 9$
c_2, c_3, c_8	$y^{25} + 22y^{24} + \cdots + 8y - 4$
c_4	$y^{25} + 14y^{24} + \cdots + 1561y - 81$
c_6, c_7, c_{10}	$y^{25} - 26y^{24} + \cdots - 47y - 9$
c_9	$y^{25} - 2y^{24} + \cdots - 2624y - 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.498082+0.831864I$ $a=-0.210637+0.234020I$ $b=0.969881-0.673526I$	$4.11705+3.30443I$	$6.15585-1.80924I$
$u=-0.498082-0.831864I$ $a=-0.210637-0.234020I$ $b=0.969881+0.673526I$	$4.11705-3.30443I$	$6.15585+1.80924I$
$u=0.404191+1.026880I$ $a=0.433491+0.988124I$ $b=0.686093-0.799024I$	$4.98459+2.21818I$	$7.23817-3.39990I$
$u=0.404191-1.026880I$ $a=0.433491-0.988124I$ $b=0.686093+0.799024I$	$4.98459-2.21818I$	$7.23817+3.39990I$
$u=-0.814894+0.282583I$ $a=0.16059+1.77022I$ $b=-1.096790-0.679709I$	$5.88761-7.92352I$	$7.71863+6.25521I$
$u=-0.814894-0.282583I$ $a=0.16059-1.77022I$ $b=-1.096790+0.679709I$	$5.88761+7.92352I$	$7.71863-6.25521I$
$u=0.045104+1.169880I$ $a=-0.509198-0.822038I$ $b=0.611097+0.519026I$	$-2.09053-1.42730I$	$3.69318+4.01748I$
$u=0.045104-1.169880I$ $a=-0.509198+0.822038I$ $b=0.611097-0.519026I$	$-2.09053+1.42730I$	$3.69318-4.01748I$
$u=0.809668+0.163514I$ $a=0.706041+1.184160I$ $b=-0.516228-0.881834I$	$7.64625+2.15851I$	$10.42476-1.29245I$
$u=0.809668-0.163514I$ $a=0.706041-1.184160I$ $b=-0.516228+0.881834I$	$7.64625-2.15851I$	$10.42476+1.29245I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.678633 + 0.221561I$ $a = 0.45061 - 2.11636I$ $b = -0.976768 + 0.540770I$	$0.03499 + 4.24383I$	$4.60496 - 6.78537I$
$u = 0.678633 - 0.221561I$ $a = 0.45061 + 2.11636I$ $b = -0.976768 - 0.540770I$	$0.03499 - 4.24383I$	$4.60496 + 6.78537I$
$u = 0.339400 + 1.358960I$ $a = -0.547153 - 0.230670I$ $b = 0.378354 + 0.934639I$	$2.85055 + 6.29490I$	$6.20266 - 3.49250I$
$u = 0.339400 - 1.358960I$ $a = -0.547153 + 0.230670I$ $b = 0.378354 - 0.934639I$	$2.85055 - 6.29490I$	$6.20266 + 3.49250I$
$u = 0.276880 + 1.384380I$ $a = 0.88077 + 1.63584I$ $b = 1.090160 - 0.576724I$	$-5.06500 + 7.73599I$	$-0.26723 - 6.67404I$
$u = 0.276880 - 1.384380I$ $a = 0.88077 - 1.63584I$ $b = 1.090160 + 0.576724I$	$-5.06500 - 7.73599I$	$-0.26723 + 6.67404I$
$u = 0.11000 + 1.41509I$ $a = -0.998644 - 0.147362I$ $b = -1.121400 - 0.226598I$	$-7.43417 + 0.37131I$	$-4.72924 + 0.01538I$
$u = 0.11000 - 1.41509I$ $a = -0.998644 + 0.147362I$ $b = -1.121400 + 0.226598I$	$-7.43417 - 0.37131I$	$-4.72924 - 0.01538I$
$u = 0.245363 + 0.498558I$ $a = 0.003216 - 0.172185I$ $b = 0.901860 + 0.293308I$	$-1.52585 - 1.04428I$	$-1.27127 + 1.42914I$
$u = 0.245363 - 0.498558I$ $a = 0.003216 + 0.172185I$ $b = 0.901860 - 0.293308I$	$-1.52585 + 1.04428I$	$-1.27127 - 1.42914I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.33191 + 1.42709I$ $a = \quad 1.00745 - 1.40966I$ $b = \quad 1.172920 + 0.648513I$	$0.44144 - 12.07650I$	$3.42339 + 7.22441I$
$u = -0.33191 - 1.42709I$ $a = \quad 1.00745 + 1.40966I$ $b = \quad 1.172920 - 0.648513I$	$0.44144 + 12.07650I$	$3.42339 - 7.22441I$
$u = -0.06236 + 1.52702I$ $a = -0.863474 + 0.102113I$ $b = -0.881284 + 0.447818I$	$-3.72172 + 1.83282I$	$3.75932 - 4.01286I$
$u = -0.06236 - 1.52702I$ $a = -0.863474 - 0.102113I$ $b = -0.881284 - 0.447818I$	$-3.72172 - 1.83282I$	$3.75932 + 4.01286I$
$u = -0.403977$ $a = \quad 1.97386$ $b = -0.435793$	0.909052	12.0940

II. $I^u_2 =$
$\langle -a^2u^2+u^2a+2au+b+2a+2u,\ -2a^2u^2+2u^2a+\cdots+5a+1,\ u^3+u^2+2u+1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} a \\ a^2u^2 - u^2a - 2au - 2a - 2u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} a^2u^2 - u^2a - 2au - a - 2u \\ a^2u^2 - u^2a - 2au - 2a - 2u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} a^2u^2 - a^2u - u^2a - a^2 - 4au - 2u^2 - a - 4u - 2 \\ -a^2u - u^2a - a^2 - 2au - 2u^2 - 2u - 2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u \\ -u^2 - u - 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^2 + 1 \\ -u^2 - u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a^2u^2 - u^2a - 2au - a - 2u \\ a^2u^2 - u^2a - 2au - 2a - 2u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^2 + 4u + 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_6 c_7, c_{10}	$u^9 - 3u^7 - u^6 + 3u^5 + 2u^4 - u^3 - u^2 + 1$
c_2, c_3, c_8	$(u^3 - u^2 + 2u - 1)^3$
c_4	$u^9 + 6u^8 + 15u^7 + 21u^6 + 19u^5 + 12u^4 + 7u^3 + 5u^2 + 2u + 1$
c_9	$(u^3 + u^2 - 1)^3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_6 c_7, c_{10}	$y^9 - 6y^8 + 15y^7 - 21y^6 + 19y^5 - 12y^4 + 7y^3 - 5y^2 + 2y - 1$
c_2, c_3, c_8	$(y^3 + 3y^2 + 2y - 1)^3$
c_4	$y^9 - 6y^8 + 11y^7 - y^6 + 11y^5 - 40y^4 - 37y^3 - 21y^2 - 6y - 1$
c_9	$(y^3 - y^2 + 2y - 1)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_2	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = -1.110710 + 0.304480I$ $b = -1.324820 + 0.175904I$	$-3.02413 - 2.82812I$	$2.49024 + 2.97945I$
$u = -0.215080 + 1.307140I$ $a = -0.633796 + 0.350292I$ $b = 0.376870 - 0.700062I$	$-3.02413 - 2.82812I$	$2.49024 + 2.97945I$
$u = -0.215080 + 1.307140I$ $a = 0.41979 - 1.77933I$ $b = 0.947946 + 0.524157I$	$-3.02413 - 2.82812I$	$2.49024 + 2.97945I$
$u = -0.215080 - 1.307140I$ $a = -1.110710 - 0.304480I$ $b = -1.324820 - 0.175904I$	$-3.02413 + 2.82812I$	$2.49024 - 2.97945I$
$u = -0.215080 - 1.307140I$ $a = -0.633796 - 0.350292I$ $b = 0.376870 + 0.700062I$	$-3.02413 + 2.82812I$	$2.49024 - 2.97945I$
$u = -0.215080 - 1.307140I$ $a = 0.41979 + 1.77933I$ $b = 0.947946 - 0.524157I$	$-3.02413 + 2.82812I$	$2.49024 - 2.97945I$
$u = -0.569840$ $a = -0.101925$ $b = 1.26384$	1.11345	9.01950
$u = -0.569840$ $a = 1.37568 + 1.52573I$ $b = -0.631920 - 0.444935I$	1.11345	9.01950
$u = -0.569840$ $a = 1.37568 - 1.52573I$ $b = -0.631920 + 0.444935I$	1.11345	9.01950

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.414210I$ $a = -1.000000 - 0.707107I$ $b = -1.00000$	-4.93480	0
$u = -1.414210I$ $a = -1.000000 + 0.707107I$ $b = -1.00000$	-4.93480	0

IV. $I_1^v = \langle a,\ b-1,\ v-1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	1.00000		
$a =$	0	0	0
$b =$	1.00000		

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)(u+1)^2(u^9-3u^7-u^6+3u^5+2u^4-u^3-u^2+1)$ $\cdot(u^{25}+2u^{24}+\cdots-u-3)$
c_2, c_3, c_8	$u(u^2+2)(u^3-u^2+2u-1)^3(u^{25}+2u^{24}+\cdots-4u-2)$
c_4	$((u-1)^3)(u^9+6u^8+\cdots+2u+1)$ $\cdot(u^{25}+10u^{24}+\cdots+97u+9)$
c_5	$(u-1)^2(u+1)(u^9-3u^7-u^6+3u^5+2u^4-u^3-u^2+1)$ $\cdot(u^{25}+2u^{24}+\cdots-u-3)$
c_6, c_7	$(u-1)^2(u+1)(u^9-3u^7-u^6+3u^5+2u^4-u^3-u^2+1)$ $\cdot(u^{25}-2u^{24}+\cdots-5u-3)$
c_9	$u(u^2+2)(u^3+u^2-1)^3(u^{25}-2u^{24}+\cdots+56u-16)$
c_{10}	$(u-1)(u+1)^2(u^9-3u^7-u^6+3u^5+2u^4-u^3-u^2+1)$ $\cdot(u^{25}-2u^{24}+\cdots-5u-3)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$((y-1)^3)(y^9-6y^8+\cdots+2y-1)$ $\cdot\,(y^{25}-10y^{24}+\cdots+97y-9)$
c_2, c_3, c_8	$y(y+2)^2(y^3+3y^2+2y-1)^3(y^{25}+22y^{24}+\cdots+8y-4)$
c_4	$((y-1)^3)(y^9-6y^8+\cdots-6y-1)$ $\cdot\,(y^{25}+14y^{24}+\cdots+1561y-81)$
c_6, c_7, c_{10}	$((y-1)^3)(y^9-6y^8+\cdots+2y-1)$ $\cdot\,(y^{25}-26y^{24}+\cdots-47y-9)$
c_9	$y(y+2)^2(y^3-y^2+2y-1)^3(y^{25}-2y^{24}+\cdots-2624y-256)$