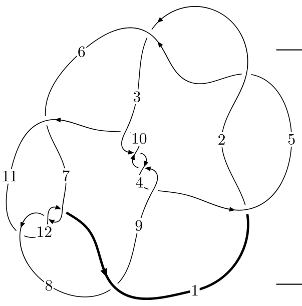
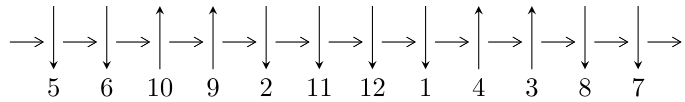
$12a_{1243}$ $(K12a_{1243})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$8,11 \xrightarrow[c_{11}]{} 12 \xrightarrow[c_7]{} 7 \xrightarrow[c_{12}]{} 1 \xrightarrow[c_8]{} 9 \xrightarrow[c_6]{} 3,6 \xrightarrow[c_2]{} 2 \xrightarrow[c_5]{} 5 \xrightarrow[c_{10}]{} 10 \xrightarrow[c_3]{} 4 \twoheadrightarrow c_1, c_4, c_9$

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

$$I_1^u = \langle 5.47710 \times 10^{15} u^{50} + 1.14235 \times 10^{16} u^{49} + \cdots + 3.64380 \times 10^{16} b - 9.84918 \times 10^{15},$$
$$1.63458 \times 10^{16} u^{50} + 1.13811 \times 10^{16} u^{49} + \cdots + 1.09314 \times 10^{17} a - 5.47544 \times 10^{16},\ u^{51} + 2u^{50} + \cdots - 3u - 3$$
$$I_2^u = \langle -au - u^2 + b + u - 1,\ 2u^2 a + a^2 + 5u^2 + 2a - 3u + 8,\ u^3 - u^2 + 2u - 1 \rangle$$
$$I_3^u = \langle b,\ u^2 + a + 1,\ u^3 + u^2 + 2u + 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 60 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.

$\boldsymbol{I_1^u = \langle 5.48\times10^{15}u^{50} + 1.14\times10^{16}u^{49} + \cdots + 3.64\times10^{16}b - 9.85\times10^{15},\ 1.63\times10^{16}u^{50} + 1.14\times10^{16}u^{49} + \cdots + 1.09\times10^{17}a - 5.48\times10^{16},\ u^{51} + 2u^{50} + \cdots - 3u - 3\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^5 - 2u^3 - u \\ -u^7 - 3u^5 - 2u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -0.149530u^{50} - 0.104114u^{49} + \cdots + 4.89363u + 0.500892 \\ -0.150313u^{50} - 0.313505u^{49} + \cdots + 0.630080u + 0.270300 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^3 + 2u \\ u^3 + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.00864236u^{50} - 0.150838u^{49} + \cdots + 4.04860u + 0.105532 \\ -0.210594u^{50} - 0.927821u^{49} + \cdots + 0.757201u + 0.320503 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.106834u^{50} - 0.00307520u^{49} + \cdots + 3.67017u - 0.436697 \\ 0.133553u^{50} - 0.167686u^{49} + \cdots - 0.0796052u + 0.0259271 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.440680u^{50} + 0.784124u^{49} + \cdots - 2.10894u + 0.0232897 \\ -0.114496u^{50} - 0.354107u^{49} + \cdots + 1.06838u + 0.0329283 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.0918724u^{50} + 0.0332380u^{49} + \cdots + 3.96964u - 0.414486 \\ 0.0811430u^{50} - 0.353168u^{49} + \cdots + 0.231766u + 0.517111 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{7943644690210290}{18218984011570829}u^{50} - \frac{5242160220330023}{18218984011570829}u^{49} + \cdots - \frac{743451738995570890}{18218984011570829}u - \frac{576014829492005222}{18218984011570829}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5	$u^{51} + 4u^{50} + \cdots + 44u - 17$
c_3, c_4, c_9 c_{10}	$u^{51} + u^{50} + \cdots - 124u^3 - 8$
c_6, c_8	$u^{51} - 2u^{50} + \cdots - 231u - 87$
c_7, c_{11}, c_{12}	$u^{51} + 2u^{50} + \cdots - 3u - 3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$y^{51} - 56y^{50} + \cdots + 3092y - 289$
c_3, c_4, c_9 c_{10}	$y^{51} + 65y^{50} + \cdots + 4352y^2 - 64$
c_6, c_8	$y^{51} - 46y^{50} + \cdots - 73311y - 7569$
c_7, c_{11}, c_{12}	$y^{51} + 42y^{50} + \cdots + 57y - 9$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.907928 + 0.131274I$ $a = -0.85159 + 2.57553I$ $b = 0.17354 + 1.71169I$	$18.9001 + 8.0570I$	$-13.49826 - 3.74079I$
$u = -0.907928 - 0.131274I$ $a = -0.85159 - 2.57553I$ $b = 0.17354 - 1.71169I$	$18.9001 - 8.0570I$	$-13.49826 + 3.74079I$
$u = 0.049806 + 1.119400I$ $a = -1.65276 - 0.63158I$ $b = 0.14103 - 1.43819I$	$-4.53961 - 0.47932I$	$-9.08978 - 0.54111I$
$u = 0.049806 - 1.119400I$ $a = -1.65276 + 0.63158I$ $b = 0.14103 + 1.43819I$	$-4.53961 + 0.47932I$	$-9.08978 + 0.54111I$
$u = 0.870747 + 0.070256I$ $a = -0.10989 - 1.48062I$ $b = 0.608525 - 0.958375I$	$-11.35660 - 4.92570I$	$-12.66557 + 4.02206I$
$u = 0.870747 - 0.070256I$ $a = -0.10989 + 1.48062I$ $b = 0.608525 + 0.958375I$	$-11.35660 + 4.92570I$	$-12.66557 - 4.02206I$
$u = -0.866790 + 0.044839I$ $a = 0.44024 - 3.22463I$ $b = -0.05531 - 1.67384I$	$-13.05010 + 3.20345I$	$-12.09771 - 2.59432I$
$u = -0.866790 - 0.044839I$ $a = 0.44024 + 3.22463I$ $b = -0.05531 + 1.67384I$	$-13.05010 - 3.20345I$	$-12.09771 + 2.59432I$
$u = -0.853858$ $a = 0.332469$ $b = 0.869508$	-8.45310	-10.4770
$u = 0.645538 + 0.554017I$ $a = 1.09788 + 1.43143I$ $b = -0.02763 + 1.69086I$	$-14.2712 - 2.2782I$	$-11.91209 + 2.93097I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.645538 - 0.554017I$ $a = 1.09788 - 1.43143I$ $b = -0.02763 - 1.69086I$	$-14.2712 + 2.2782I$	$-11.91209 - 2.93097I$
$u = 0.098307 + 1.231160I$ $a = -1.087560 + 0.607902I$ $b = 0.422786 + 0.380273I$	$1.39334 - 1.58061I$	$-4.00000 + 0.I$
$u = 0.098307 - 1.231160I$ $a = -1.087560 - 0.607902I$ $b = 0.422786 - 0.380273I$	$1.39334 + 1.58061I$	$-4.00000 + 0.I$
$u = 0.761889 + 0.030162I$ $a = 0.14348 + 1.84705I$ $b = -0.227333 + 0.836438I$	$-4.19077 - 2.14878I$	$-11.40445 + 4.59039I$
$u = 0.761889 - 0.030162I$ $a = 0.14348 - 1.84705I$ $b = -0.227333 - 0.836438I$	$-4.19077 + 2.14878I$	$-11.40445 - 4.59039I$
$u = -0.488015 + 1.149550I$ $a = -0.480142 + 1.284100I$ $b = -0.14196 + 1.72564I$	$-17.4585 - 3.1002I$	0
$u = -0.488015 - 1.149550I$ $a = -0.480142 - 1.284100I$ $b = -0.14196 - 1.72564I$	$-17.4585 + 3.1002I$	0
$u = 0.303333 + 1.240150I$ $a = 0.481754 + 0.904540I$ $b = 0.082101 + 0.850538I$	$-0.47130 - 1.69507I$	0
$u = 0.303333 - 1.240150I$ $a = 0.481754 - 0.904540I$ $b = 0.082101 - 0.850538I$	$-0.47130 + 1.69507I$	0
$u = 0.418137 + 1.207070I$ $a = -0.181479 - 0.248186I$ $b = -0.556081 - 1.021520I$	$-7.85706 + 0.30900I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.418137 - 1.207070I$ $a = -0.181479 + 0.248186I$ $b = -0.556081 + 1.021520I$	$-7.85706 - 0.30900I$	0
$u = -0.052017 + 1.294910I$ $a = 0.953642 - 0.051833I$ $b = -0.447473 - 0.419214I$	$4.49060 + 1.57458I$	0
$u = -0.052017 - 1.294910I$ $a = 0.953642 + 0.051833I$ $b = -0.447473 + 0.419214I$	$4.49060 - 1.57458I$	0
$u = -0.410167 + 1.234410I$ $a = 0.96089 - 1.81167I$ $b = 0.01537 - 1.67225I$	$-9.37724 + 1.37166I$	0
$u = -0.410167 - 1.234410I$ $a = 0.96089 + 1.81167I$ $b = 0.01537 + 1.67225I$	$-9.37724 - 1.37166I$	0
$u = -0.259573 + 1.277840I$ $a = -0.313273 + 0.355431I$ $b = 0.450243 - 0.039258I$	$2.27192 + 3.32252I$	0
$u = -0.259573 - 1.277840I$ $a = -0.313273 - 0.355431I$ $b = 0.450243 + 0.039258I$	$2.27192 - 3.32252I$	0
$u = 0.332771 + 1.284440I$ $a = -1.05807 - 1.05291I$ $b = 0.338435 - 0.828395I$	$-0.09882 - 6.10554I$	0
$u = 0.332771 - 1.284440I$ $a = -1.05807 + 1.05291I$ $b = 0.338435 + 0.828395I$	$-0.09882 + 6.10554I$	0
$u = -0.393305 + 1.273120I$ $a = 0.441102 - 0.573712I$ $b = -0.865536 + 0.073675I$	$-4.49930 + 4.47398I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.393305 - 1.273120I$ $a = 0.441102 + 0.573712I$ $b = -0.865536 - 0.073675I$	$-4.49930 - 4.47398I$	0
$u = -0.660643$ $a = -0.232662$ $b = -0.401553$	-1.71027	-3.43300
$u = 0.148769 + 1.331880I$ $a = 1.213820 - 0.003770I$ $b = -0.05720 + 1.47291I$	$-1.60931 - 3.17982I$	0
$u = 0.148769 - 1.331880I$ $a = 1.213820 + 0.003770I$ $b = -0.05720 - 1.47291I$	$-1.60931 + 3.17982I$	0
$u = -0.487213 + 0.407368I$ $a = 0.952102 - 0.113234I$ $b = -0.144630 - 0.903505I$	$-5.05412 + 1.66912I$	$-10.97373 - 4.62737I$
$u = -0.487213 - 0.407368I$ $a = 0.952102 + 0.113234I$ $b = -0.144630 + 0.903505I$	$-5.05412 - 1.66912I$	$-10.97373 + 4.62737I$
$u = -0.397349 + 1.308030I$ $a = -1.65562 + 1.61052I$ $b = 0.08962 + 1.66718I$	$-8.82655 + 7.73768I$	0
$u = -0.397349 - 1.308030I$ $a = -1.65562 - 1.61052I$ $b = 0.08962 - 1.66718I$	$-8.82655 - 7.73768I$	0
$u = 0.396413 + 1.325070I$ $a = 1.20491 + 0.91251I$ $b = -0.640552 + 0.900828I$	$-6.99006 - 9.47255I$	0
$u = 0.396413 - 1.325070I$ $a = 1.20491 - 0.91251I$ $b = -0.640552 - 0.900828I$	$-6.99006 + 9.47255I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.153785 + 1.383640I$ $a = -0.828540 - 0.587282I$ $b = 0.236607 + 0.683213I$	$0.58476 + 3.87146I$	0
$u = -0.153785 - 1.383640I$ $a = -0.828540 + 0.587282I$ $b = 0.236607 - 0.683213I$	$0.58476 - 3.87146I$	0
$u = -0.40573 + 1.36865I$ $a = 1.84188 - 1.07241I$ $b = -0.19235 - 1.69170I$	$-15.8596 + 12.7667I$	0
$u = -0.40573 - 1.36865I$ $a = 1.84188 + 1.07241I$ $b = -0.19235 + 1.69170I$	$-15.8596 - 12.7667I$	0
$u = 0.15668 + 1.46609I$ $a = -0.952170 + 0.297878I$ $b = 0.06047 - 1.64270I$	$-7.63888 - 4.94907I$	0
$u = 0.15668 - 1.46609I$ $a = -0.952170 - 0.297878I$ $b = 0.06047 + 1.64270I$	$-7.63888 + 4.94907I$	0
$u = 0.424316 + 0.265115I$ $a = -1.41012 - 2.43053I$ $b = -0.00144 - 1.49759I$	$-6.57052 - 1.14577I$	$-8.04300 + 6.02810I$
$u = 0.424316 - 0.265115I$ $a = -1.41012 + 2.43053I$ $b = -0.00144 + 1.49759I$	$-6.57052 + 1.14577I$	$-8.04300 - 6.02810I$
$u = 0.351513$ $a = 2.15459$ $b = -0.342179$	-2.23327	1.33350
$u = -0.203339 + 0.264461I$ $a = -0.777669 + 0.662838I$ $b = 0.175873 + 0.407856I$	$-0.158036 + 0.749712I$	$-4.84555 - 9.27744I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.203339 - 0.264461I$		
$a = -0.777669 - 0.662838I$	$-0.158036 - 0.749712I$	$-4.84555 + 9.27744I$
$b = 0.175873 - 0.407856I$		

II.

$$\boldsymbol{I^u_2 = \langle -au - u^2 + b + u - 1,\ 2u^2a + a^2 + 5u^2 + 2a - 3u + 8,\ u^3 - u^2 + 2u - 1\rangle}$$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ u^2 - u + 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 - u + 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} a \\ au + u^2 - u + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^2 + 1 \\ u^2 - u + 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^2 + a + 1 \\ au + 2u^2 - 2u + 2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -a \\ -au - u^2 + u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2a + au - 2u^2 - a + 2u - 4 \\ -2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} au + u^2 - a - u + 1 \\ -au - u^2 + u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^2 + 4u - 16$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u+1)^6$
c_3, c_4, c_9 c_{10}	$(u^2+2)^3$
c_5	$(u-1)^6$
c_6, c_8	$(u^3-u^2+1)^2$
c_7	$(u^3+u^2+2u+1)^2$
c_{11}, c_{12}	$(u^3-u^2+2u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$(y-1)^6$
c_3, c_4, c_9 c_{10}	$(y+2)^6$
c_6, c_8	$(y^3 - y^2 + 2y - 1)^2$
c_7, c_{11}, c_{12}	$(y^3 + 3y^2 + 2y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.215080 + 1.307140I$ $a = -0.391035 - 0.735607I$ $b = -1.414210I$	$-3.55561 - 2.82812I$	$-8.49024 + 2.97945I$
$u = 0.215080 + 1.307140I$ $a = 1.71575 - 0.38895I$ $b = 1.414210I$	$-3.55561 - 2.82812I$	$-8.49024 + 2.97945I$
$u = 0.215080 - 1.307140I$ $a = -0.391035 + 0.735607I$ $b = 1.414210I$	$-3.55561 + 2.82812I$	$-8.49024 - 2.97945I$
$u = 0.215080 - 1.307140I$ $a = 1.71575 + 0.38895I$ $b = -1.414210I$	$-3.55561 + 2.82812I$	$-8.49024 - 2.97945I$
$u = 0.569840$ $a = -1.32472 + 2.48177I$ $b = 1.414210I$	-7.69319	-15.0200
$u = 0.569840$ $a = -1.32472 - 2.48177I$ $b = -1.414210I$	-7.69319	-15.0200

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

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 + u + 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^2 - 1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^2 - 1 \\ -u^2 - u - 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0 \\ u^2 + u + 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^2 - 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^2 - 1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6u^2 - 4u - 16$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^3$
c_3, c_4, c_9 c_{10}	u^3
c_5	$(u+1)^3$
c_6, c_8	$u^3 + u^2 - 1$
c_7	$u^3 - u^2 + 2u - 1$
c_{11}, c_{12}	$u^3 + u^2 + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$(y-1)^3$
c_3, c_4, c_9 c_{10}	y^3
c_6, c_8	$y^3 - y^2 + 2y - 1$
c_7, c_{11}, c_{12}	$y^3 + 3y^2 + 2y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = 0.662359 + 0.562280I$ $b = 0$	$1.37919 + 2.82812I$	$-5.16553 - 1.85489I$
$u = -0.215080 - 1.307140I$ $a = 0.662359 - 0.562280I$ $b = 0$	$1.37919 - 2.82812I$	$-5.16553 + 1.85489I$
$u = -0.569840$ $a = -1.32472$ $b = 0$	-2.75839	-15.6690

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^3)(u+1)^6(u^{51}+4u^{50}+\cdots+44u-17)$
c_3, c_4, c_9 c_{10}	$u^3(u^2+2)^3(u^{51}+u^{50}+\cdots-124u^3-8)$
c_5	$((u-1)^6)(u+1)^3(u^{51}+4u^{50}+\cdots+44u-17)$
c_6, c_8	$((u^3-u^2+1)^2)(u^3+u^2-1)(u^{51}-2u^{50}+\cdots-231u-87)$
c_7	$(u^3-u^2+2u-1)(u^3+u^2+2u+1)^2(u^{51}+2u^{50}+\cdots-3u-3)$
c_{11}, c_{12}	$((u^3-u^2+2u-1)^2)(u^3+u^2+2u+1)(u^{51}+2u^{50}+\cdots-3u-3)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$((y-1)^9)(y^{51} - 56y^{50} + \cdots + 3092y - 289)$
c_3, c_4, c_9 c_{10}	$y^3(y+2)^6(y^{51} + 65y^{50} + \cdots + 4352y^2 - 64)$
c_6, c_8	$((y^3 - y^2 + 2y - 1)^3)(y^{51} - 46y^{50} + \cdots - 73311y - 7569)$
c_7, c_{11}, c_{12}	$((y^3 + 3y^2 + 2y - 1)^3)(y^{51} + 42y^{50} + \cdots + 57y - 9)$