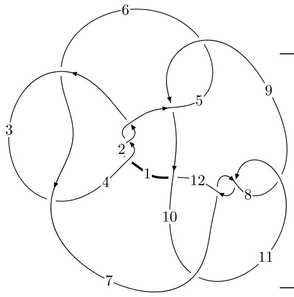
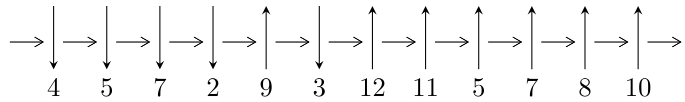
$12n_{0676}$ $(K12n_{0676})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -16813289u^{16} - 180512824u^{15} + \cdots + 3759358808b + 173269993, \\
&\quad 296972219u^{16} + 3308940840u^{15} + \cdots + 1127807424a - 11385348987, \\
&\quad u^{17} + 11u^{16} + \cdots - 24u + 1 \rangle \\
I_2^u &= \langle a^2 + b + a + 2,\ a^3 + 2a - 1,\ u - 1 \rangle \\
I_3^u &= \langle b^3 + b^2u + b^2 - 2u - 3,\ a,\ u^2 + u - 1 \rangle \\
I_4^u &= \langle -a^3 - a^2 + b - a - 2,\ a^4 + a^3 + 2a^2 + 2a + 1,\ u - 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 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.

$\boldsymbol{I_1^u = \langle -1.68 \times 10^7 u^{16} - 1.81 \times 10^8 u^{15} + \cdots + 3.76 \times 10^8 b + 1.73 \times 10^8,\ 2.97 \times 10^8 u^{16} + 3.31 \times 10^9 u^{15} + \cdots + 1.13 \times 10^9 a - 1.14 \times 10^{10},\ u^{17} + 11u^{16} + \cdots - 24u + 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.263318u^{16} - 2.93396u^{15} + \cdots + 47.5834u + 10.0951 \\ 0.0447238u^{16} + 0.480169u^{15} + \cdots - 1.76545u - 0.460903 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.263318u^{16} - 2.93396u^{15} + \cdots + 47.5834u + 10.0951 \\ 0.0407732u^{16} + 0.444464u^{15} + \cdots - 2.40115u - 0.423444 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.192384u^{16} - 2.10577u^{15} + \cdots + 12.3045u + 4.41593 \\ -0.00859093u^{16} - 0.0907645u^{15} + \cdots - 0.527045u - 0.177073 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.183793u^{16} - 2.01500u^{15} + \cdots + 12.8316u + 4.59300 \\ -0.00859093u^{16} - 0.0907645u^{15} + \cdots - 0.527045u - 0.177073 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -0.115128u^{16} - 1.29525u^{15} + \cdots + 24.3045u + 7.93474 \\ 0.0334181u^{16} + 0.371617u^{15} + \cdots - 3.22037u - 0.304091 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.157121u^{16} - 1.73385u^{15} + \cdots + 10.9663u + 7.16044 \\ 0.0206240u^{16} + 0.231250u^{15} + \cdots - 4.03477u - 0.167498 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0.183793u^{16} + 2.01500u^{15} + \cdots - 12.8316u - 4.59300 \\ -0.00282593u^{16} - 0.0405560u^{15} + \cdots + 3.13714u + 0.174058 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{69994879}{187967904}u^{16} - \frac{2321600843}{563903712}u^{15} + \cdots + \frac{17938178839}{563903712}u + \frac{1576601201}{140975928}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{17} - 11u^{16} + \cdots - 24u - 1$
c_3, c_6	$u^{17} + 4u^{16} + \cdots - 832u + 128$
c_5, c_9	$u^{17} - 2u^{16} + \cdots + 224u + 64$
c_7, c_8, c_{11}	$u^{17} + 4u^{16} + \cdots - 6u + 1$
c_{10}	$u^{17} - 4u^{16} + \cdots - 228u + 36$
c_{12}	$u^{17} + 10u^{16} + \cdots + 4024u - 209$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{17} - 15y^{16} + \cdots + 798y - 1$
c_3, c_6	$y^{17} + 36y^{16} + \cdots + 487424y - 16384$
c_5, c_9	$y^{17} - 28y^{16} + \cdots + 50176y - 4096$
c_7, c_8, c_{11}	$y^{17} + 14y^{16} + \cdots + 46y - 1$
c_{10}	$y^{17} - 26y^{16} + \cdots + 52488y - 1296$
c_{12}	$y^{17} - 42y^{16} + \cdots + 23042342y - 43681$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.770740 + 0.671347I$ $a = -0.997689 + 0.128313I$ $b = 0.36849 + 1.84869I$	$-1.47635 + 0.05755I$	$-2.53546 - 1.02432I$
$u = 0.770740 - 0.671347I$ $a = -0.997689 - 0.128313I$ $b = 0.36849 - 1.84869I$	$-1.47635 - 0.05755I$	$-2.53546 + 1.02432I$
$u = 1.020510 + 0.262233I$ $a = 0.189037 + 0.622417I$ $b = 0.31322 + 1.67490I$	$-4.25199 + 2.42274I$	$-9.52858 - 5.40161I$
$u = 1.020510 - 0.262233I$ $a = 0.189037 - 0.622417I$ $b = 0.31322 - 1.67490I$	$-4.25199 - 2.42274I$	$-9.52858 + 5.40161I$
$u = 0.820811$ $a = -0.456752$ $b = 1.11676$	-1.14452	-10.7900
$u = -1.51389 + 0.34866I$ $a = 0.676735 - 0.602259I$ $b = -0.66800 + 1.79459I$	$-11.88260 - 4.06700I$	$-5.53941 + 2.68623I$
$u = -1.51389 - 0.34866I$ $a = 0.676735 + 0.602259I$ $b = -0.66800 - 1.79459I$	$-11.88260 + 4.06700I$	$-5.53941 - 2.68623I$
$u = -0.125776 + 0.182671I$ $a = 0.73842 + 3.45151I$ $b = 0.252663 + 0.770640I$	$-3.46734 + 2.21457I$	$2.76869 - 2.41313I$
$u = -0.125776 - 0.182671I$ $a = 0.73842 - 3.45151I$ $b = 0.252663 - 0.770640I$	$-3.46734 - 2.21457I$	$2.76869 + 2.41313I$
$u = -1.87471$ $a = -0.672225$ $b = 2.12731$	-7.11600	2.44290

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.0351827$ $a = 11.8728$ $b = -0.547681$	0.826037	12.4770
$u = -1.73829 + 1.01976I$ $a = -0.446194 - 1.097630I$ $b = 5.09465 - 1.32883I$	$7.23703 + 11.70460I$	$-2.64244 - 4.71416I$
$u = -1.73829 - 1.01976I$ $a = -0.446194 + 1.097630I$ $b = 5.09465 + 1.32883I$	$7.23703 - 11.70460I$	$-2.64244 + 4.71416I$
$u = -1.85948 + 1.35841I$ $a = 0.410440 + 1.181970I$ $b = -6.80560 + 2.10743I$	$12.6875 + 6.3547I$	$0.47634 - 2.59876I$
$u = -1.85948 - 1.35841I$ $a = 0.410440 - 1.181970I$ $b = -6.80560 - 2.10743I$	$12.6875 - 6.3547I$	$0.47634 + 2.59876I$
$u = -1.54446 + 1.96036I$ $a = -0.442677 - 1.276270I$ $b = 7.09639 - 6.41609I$	$9.80581 + 0.01769I$	$-1.064012 + 0.845538I$
$u = -1.54446 - 1.96036I$ $a = -0.442677 + 1.276270I$ $b = 7.09639 + 6.41609I$	$9.80581 - 0.01769I$	$-1.064012 - 0.845538I$

II. $I_2^u = \langle a^2 + b + a + 2,\ a^3 + 2a - 1,\ u - 1 \rangle$

(i) Arc colorings

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

$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} a \\ -a^2 - a - 2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} a \\ -a^2 - 2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} a^2 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} a^2 \\ 0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -a^2 - a + 1 \\ -a^2 - a - 2 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} a^2 \\ -a^2 - 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 11a^2 + 9a + 22$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^3$
c_3, c_6	u^3
c_4	$(u+1)^3$
c_5, c_7, c_8	u^3+2u+1
c_9, c_{11}, c_{12}	u^3+2u-1
c_{10}	u^3-3u^2+5u-2

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^3$
c_3, c_6	y^3
c_5, c_7, c_8 c_9, c_{11}, c_{12}	$y^3 + 4y^2 + 4y - 1$
c_{10}	$y^3 + y^2 + 13y - 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -0.22670 + 1.46771I$ $b = 0.329484 - 0.802255I$	$-11.08570 - 5.13794I$	$-3.17092 + 5.88938I$
$u = 1.00000$ $a = -0.22670 - 1.46771I$ $b = 0.329484 + 0.802255I$	$-11.08570 + 5.13794I$	$-3.17092 - 5.88938I$
$u = 1.00000$ $a = 0.453398$ $b = -2.65897$	-0.857735	28.3420

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -b^2u - 2b^2 - bu + 3b + 3u - 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = 0$ $b = 1.22142$	0.126494	-3.14230
$u = 0.618034$ $a = 0$ $b = -1.41973 + 1.20521I$	$-4.01109 - 2.82812I$	$-7.00182 + 11.83005I$
$u = 0.618034$ $a = 0$ $b = -1.41973 - 1.20521I$	$-4.01109 + 2.82812I$	$-7.00182 - 11.83005I$
$u = -1.61803$ $a = 0$ $b = 0.542287 + 0.460350I$	$-11.90680 + 2.82812I$	$-6.38118 + 1.93520I$
$u = -1.61803$ $a = 0$ $b = 0.542287 - 0.460350I$	$-11.90680 - 2.82812I$	$-6.38118 - 1.93520I$
$u = -1.61803$ $a = 0$ $b = -0.466540$	-7.76919	-11.0920

IV. $\boldsymbol{I_4^u = \langle -a^3 - a^2 + b - a - 2,\ a^4 + a^3 + 2a^2 + 2a + 1,\ u - 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a \\ a^3 + a^2 + a + 2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a \\ a^3 + a^2 + 2a + 2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} a^2 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a^2 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -1 \\ a^3 + a^2 + a + 2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -a^3 - a - 1 \\ 3a^3 + a^2 + 5a + 3 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} a^2 \\ -a^2 - 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4a^3 - 3a^2 + 4a - 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^4$
c_3, c_6	u^4
c_4	$(u+1)^4$
c_5, c_7, c_8	$u^4 - u^3 + 2u^2 - 2u + 1$
c_9, c_{11}, c_{12}	$u^4 + u^3 + 2u^2 + 2u + 1$
c_{10}	$(u^2 + u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^4$
c_3, c_6	y^4
c_5, c_7, c_8 c_9, c_{11}, c_{12}	$y^4 + 3y^3 + 2y^2 + 1$
c_{10}	$(y^2 + y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -0.621744 + 0.440597I$ $b = 1.69244 + 0.31815I$	$-4.93480 - 2.02988I$	$-6.57732 + 5.10773I$
$u = 1.00000$ $a = -0.621744 - 0.440597I$ $b = 1.69244 - 0.31815I$	$-4.93480 + 2.02988I$	$-6.57732 - 5.10773I$
$u = 1.00000$ $a = 0.121744 + 1.306620I$ $b = -0.192440 - 0.547877I$	$-4.93480 + 2.02988I$	$-0.92268 - 4.41855I$
$u = 1.00000$ $a = 0.121744 - 1.306620I$ $b = -0.192440 + 0.547877I$	$-4.93480 - 2.02988I$	$-0.92268 + 4.41855I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^7)(u^2+u-1)^3(u^{17}-11u^{16}+\cdots-24u-1)$
c_3	$u^7(u^2+u-1)^3(u^{17}+4u^{16}+\cdots-832u+128)$
c_4	$((u+1)^7)(u^2-u-1)^3(u^{17}-11u^{16}+\cdots-24u-1)$
c_5	$u^6(u^3+2u+1)(u^4-u^3+\cdots-2u+1)(u^{17}-2u^{16}+\cdots+224u+64)$
c_6	$u^7(u^2-u-1)^3(u^{17}+4u^{16}+\cdots-832u+128)$
c_7, c_8	$(u^3+2u+1)(u^3+u^2+2u+1)^2(u^4-u^3+2u^2-2u+1)$ $\cdot(u^{17}+4u^{16}+\cdots-6u+1)$
c_9	$u^6(u^3+2u-1)(u^4+u^3+\cdots+2u+1)(u^{17}-2u^{16}+\cdots+224u+64)$
c_{10}	$(u^2+u+1)^2(u^3-3u^2+5u-2)(u^3+u^2-1)^2$ $\cdot(u^{17}-4u^{16}+\cdots-228u+36)$
c_{11}	$(u^3+2u-1)(u^3-u^2+2u-1)^2(u^4+u^3+2u^2+2u+1)$ $\cdot(u^{17}+4u^{16}+\cdots-6u+1)$
c_{12}	$(u^3+2u-1)(u^3+u^2-1)^2(u^4+u^3+2u^2+2u+1)$ $\cdot(u^{17}+10u^{16}+\cdots+4024u-209)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y-1)^7)(y^2-3y+1)^3(y^{17}-15y^{16}+\cdots+798y-1)$
c_3, c_6	$y^7(y^2-3y+1)^3(y^{17}+36y^{16}+\cdots+487424y-16384)$
c_5, c_9	$y^6(y^3+4y^2+4y-1)(y^4+3y^3+2y^2+1)$ $\cdot\,(y^{17}-28y^{16}+\cdots+50176y-4096)$
c_7, c_8, c_{11}	$(y^3+3y^2+2y-1)^2(y^3+4y^2+4y-1)(y^4+3y^3+2y^2+1)$ $\cdot\,(y^{17}+14y^{16}+\cdots+46y-1)$
c_{10}	$(y^2+y+1)^2(y^3-y^2+2y-1)^2(y^3+y^2+13y-4)$ $\cdot\,(y^{17}-26y^{16}+\cdots+52488y-1296)$
c_{12}	$(y^3-y^2+2y-1)^2(y^3+4y^2+4y-1)(y^4+3y^3+2y^2+1)$ $\cdot\,(y^{17}-42y^{16}+\cdots+23042342y-43681)$