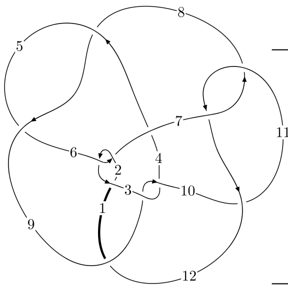
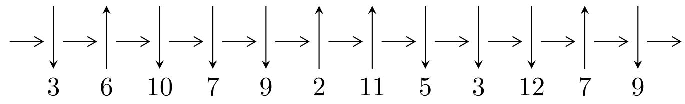
$12n_{0509}$ ($K12n_{0509}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -u^6 + 3u^5 - 6u^4 + 7u^3 - 6u^2 + b + 3u - 1,\ u^6 - 3u^5 + 6u^4 - 7u^3 + 5u^2 + a - 3u, \\
&\quad u^7 - 3u^6 + 7u^5 - 10u^4 + 10u^3 - 8u^2 + 3u - 1\rangle \\
I_2^u &= \langle -3u^{13} + 14u^{12} + \cdots + 4b + 4,\ u^{13} - 8u^{12} + \cdots + 8a - 4,\ u^{14} - 6u^{13} + \cdots - 28u + 8\rangle \\
I_3^u &= \langle -u^2 + b + a - 1,\ a^2 + au + 2u^2 - a + u,\ u^3 + u^2 + 2u + 1\rangle \\
I_4^u &= \langle -u^6 - u^5 - 2u^4 - u^3 - 2u^2 + b - u - 1,\ u^6 + u^5 + 2u^4 + u^3 + 3u^2 + a + u + 2, \\
&\quad u^7 + u^6 + 3u^5 + 2u^4 + 4u^3 + 2u^2 + 3u + 1\rangle \\
I_5^u &= \langle -2u^2a - au - 2u^2 + b - 2a - u - 4,\ 2u^2a + a^2 + 2u^2 + 3a + 2u + 4,\ u^3 + u^2 + 2u + 1\rangle \\
I_6^u &= \langle -u^2a + 2u^2 + 2b + u + 3,\ a^2 + 3u^2 + 3u + 2,\ u^3 + u^2 + 2u + 1\rangle \\
I_7^u &= \langle u^6 + u^5 + 2u^4 + u^3 + u^2 + b + u + 1,\ -2u^7 - 2u^6 - 5u^5 - 3u^4 - 3u^3 - 3u^2 + a - 4u - 1, \\
&\quad u^8 + u^7 + 3u^6 + 2u^5 + 3u^4 + 2u^3 + 3u^2 + u + 1\rangle
\end{aligned}$$

* 7 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 54 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. $\boldsymbol{I_1^u = \langle -u^6+3u^5-6u^4+7u^3-6u^2+b+3u-1,\ u^6-3u^5+6u^4-7u^3+5u^2+a-3u,\ u^7-3u^6+7u^5-10u^4+10u^3-8u^2+3u-1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} u \\ u^3+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^6+3u^5-6u^4+7u^3-5u^2+3u \\ u^6-3u^5+6u^4-7u^3+6u^2-3u+1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^6+2u^5-4u^4+4u^3-3u^2+2u \\ -u^3-u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^3 \\ u^5+u^3+u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^5+2u^4-3u^3+3u^2-u+1 \\ -u^6+3u^5-6u^4+7u^3-6u^2+3u-1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^6+2u^5-4u^4+4u^3-3u^2+2u \\ -u^6+3u^5-6u^4+7u^3-6u^2+3u-1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^6+2u^5-4u^4+4u^3-u^2+u+1 \\ -u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^5-2u^4+4u^3-4u^2+2u-1 \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^5-2u^4+4u^3-4u^2+u-1 \\ u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^6-8u^5+20u^4-32u^3+36u^2-30u+5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^7+5u^6+9u^5-2u^4-24u^3-24u^2-7u-1$
c_2, c_6, c_7 c_{11}	$u^7-3u^6+7u^5-10u^4+10u^3-8u^2+3u-1$
c_3, c_5, c_8 c_9	$u^7+5u^6+8u^5+4u^4+2u^3+5u^2+3u+1$
c_4, c_{12}	$u^7-u^6-8u^5+5u^4+21u^3+14u^2+4u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^7 - 7y^6 + 53y^5 - 210y^4 + 364y^3 - 244y^2 + y - 1$
c_2, c_6, c_7 c_{11}	$y^7 + 5y^6 + 9y^5 - 2y^4 - 24y^3 - 24y^2 - 7y - 1$
c_3, c_5, c_8 c_9	$y^7 - 9y^6 + 28y^5 - 28y^4 + 2y^3 - 21y^2 - y - 1$
c_4, c_{12}	$y^7 - 17y^6 + 116y^5 - 325y^4 + 239y^3 - 38y^2 - 12y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.136302 + 1.137730I$ $a = -1.052660 + 0.165088I$ $b = 0.776815 + 0.145062I$	$-4.44698 + 2.33074I$	$-9.82174 - 3.80507I$
$u = 0.136302 - 1.137730I$ $a = -1.052660 - 0.165088I$ $b = 0.776815 - 0.145062I$	$-4.44698 - 2.33074I$	$-9.82174 + 3.80507I$
$u = 1.24390$ $a = 0.333091$ $b = 2.21419$	-11.4456	-6.73760
$u = 0.194340 + 0.463986I$ $a = 0.726250 + 0.493271I$ $b = 0.096235 - 0.312929I$	$-0.189704 + 0.962753I$	$-3.67202 - 7.06800I$
$u = 0.194340 - 0.463986I$ $a = 0.726250 - 0.493271I$ $b = 0.096235 + 0.312929I$	$-0.189704 - 0.962753I$	$-3.67202 + 7.06800I$
$u = 0.54741 + 1.45600I$ $a = 1.65987 + 0.82195I$ $b = -2.48014 + 0.77211I$	$18.5842 + 12.7630I$	$-10.63743 - 5.46514I$
$u = 0.54741 - 1.45600I$ $a = 1.65987 - 0.82195I$ $b = -2.48014 - 0.77211I$	$18.5842 - 12.7630I$	$-10.63743 + 5.46514I$

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle -3u^{13}+14u^{12}+\cdots+4b+4,\ u^{13}-8u^{12}+\cdots+8a-4,\ u^{14}-6u^{13}+\cdots-28u+8\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3+u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -\frac{1}{8}u^{13}+u^{12}+\cdots-\frac{3}{4}u+\frac{1}{2} \\ \frac{3}{4}u^{13}-\frac{7}{2}u^{12}+\cdots+5u-1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -\frac{1}{8}u^{13}+\frac{3}{4}u^{11}+\cdots+\frac{21}{4}u-\frac{3}{2} \\ -\frac{5}{4}u^{13}+\frac{13}{2}u^{12}+\cdots-17u+5 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3 \\ u^5+u^3+u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{1}{8}u^{13}-u^{12}+\cdots+\frac{21}{4}u-1 \\ \frac{1}{4}u^{13}-u^{12}+\cdots+\frac{13}{2}u-3 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{3}{8}u^{13}-2u^{12}+\cdots+\frac{47}{4}u-4 \\ \frac{1}{4}u^{13}-u^{12}+\cdots+\frac{13}{2}u-3 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{5}{8}u^{13}-\frac{13}{4}u^{12}+\cdots+7u-1 \\ -\frac{1}{2}u^{13}+\frac{5}{2}u^{12}+\cdots-\frac{13}{2}u+3 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{1}{8}u^{13}+u^{12}+\cdots-\frac{17}{4}u+1 \\ \frac{3}{4}u^{13}-4u^{12}+\cdots+\frac{31}{2}u-5 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -\frac{7}{8}u^{13}+5u^{12}+\cdots-\frac{79}{4}u+6 \\ \frac{3}{4}u^{13}-4u^{12}+\cdots+\frac{31}{2}u-5 \end{pmatrix}$$

(ii) Obstruction class $=-1$

(iii) Cusp Shapes $=-2u^{13}+12u^{12}-43u^{11}+105u^{10}-196u^9+295u^8-375u^7+414u^6-395u^5+319u^4-217u^3+130u^2-70u+18$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{14} + 8u^{13} + \cdots + 240u + 64$
c_2, c_6, c_7 c_{11}	$u^{14} - 6u^{13} + \cdots - 28u + 8$
c_3, c_5, c_8 c_9	$(u^7 - 2u^6 - 3u^5 + 7u^4 - 3u^2 + 1)^2$
c_4, c_{12}	$u^{14} - 2u^{13} + \cdots + 15u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{14} + 72y^{12} + \cdots + 13056y + 4096$
c_2, c_6, c_7 c_{11}	$y^{14} + 8y^{13} + \cdots + 240y + 64$
c_3, c_5, c_8 c_9	$(y^7 - 10y^6 + 37y^5 - 61y^4 + 46y^3 - 23y^2 + 6y - 1)^2$
c_4, c_{12}	$y^{14} - 24y^{13} + \cdots - 53y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.625244 + 0.634655I$ $a = 0.339092 + 0.351980I$ $b = 0.233020 - 0.022062I$	$0.091886 + 0.891330I$	$-6.03895 - 5.74662I$
$u = 0.625244 - 0.634655I$ $a = 0.339092 - 0.351980I$ $b = 0.233020 + 0.022062I$	$0.091886 - 0.891330I$	$-6.03895 + 5.74662I$
$u = -0.378126 + 1.062500I$ $a = -1.121480 - 0.077660I$ $b = 0.404958 + 1.328870I$	$-1.03722 - 4.17104I$	$-10.56067 + 2.18298I$
$u = -0.378126 - 1.062500I$ $a = -1.121480 + 0.077660I$ $b = 0.404958 - 1.328870I$	$-1.03722 + 4.17104I$	$-10.56067 - 2.18298I$
$u = 0.643460 + 1.009790I$ $a = -0.104502 - 0.643158I$ $b = 0.260752 - 0.097466I$	$-1.03722 + 4.17104I$	$-10.56067 - 2.18298I$
$u = 0.643460 - 1.009790I$ $a = -0.104502 + 0.643158I$ $b = 0.260752 + 0.097466I$	$-1.03722 - 4.17104I$	$-10.56067 + 2.18298I$
$u = 1.204680 + 0.069237I$ $a = -0.311651 - 0.047691I$ $b = -2.19150 + 0.08443I$	$-16.0632 + 6.5463I$	$-8.56192 - 3.00206I$
$u = 1.204680 - 0.069237I$ $a = -0.311651 + 0.047691I$ $b = -2.19150 - 0.08443I$	$-16.0632 - 6.5463I$	$-8.56192 + 3.00206I$
$u = -0.321436 + 0.722211I$ $a = 1.113680 + 0.162158I$ $b = 0.125852 - 0.871897I$	$0.091886 + 0.891330I$	$-6.03895 - 5.74662I$
$u = -0.321436 - 0.722211I$ $a = 1.113680 - 0.162158I$ $b = 0.125852 + 0.871897I$	$0.091886 - 0.891330I$	$-6.03895 + 5.74662I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.63252 + 1.42544I$ $a = 1.28836 + 1.02059I$ $b = -2.20148 + 0.65782I$	19.2127	$-10.67691 + 0.I$
$u = 0.63252 - 1.42544I$ $a = 1.28836 - 1.02059I$ $b = -2.20148 - 0.65782I$	19.2127	$-10.67691 + 0.I$
$u = 0.59366 + 1.46472I$ $a = -1.45351 - 0.86882I$ $b = 2.36839 - 0.76461I$	$-16.0632 + 6.5463I$	$-8.56192 - 3.00206I$
$u = 0.59366 - 1.46472I$ $a = -1.45351 + 0.86882I$ $b = 2.36839 + 0.76461I$	$-16.0632 - 6.5463I$	$-8.56192 + 3.00206I$

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 8u^2 + 8u + 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^3 + 3u^2 + 2u - 1)^2$
c_2, c_6, c_7 c_{11}	$(u^3 + u^2 + 2u + 1)^2$
c_3, c_5, c_8 c_9	$u^6 + u^5 - 2u^4 + 5u^3 + 14u^2 - 8$
c_4, c_{12}	$u^6 - 4u^5 - 3u^4 + 14u^3 + 14u^2 + 2u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^3 - 5y^2 + 10y - 1)^2$
c_2, c_6, c_7 c_{11}	$(y^3 + 3y^2 + 2y - 1)^2$
c_3, c_5, c_8 c_9	$y^6 - 5y^5 + 22y^4 - 97y^3 + 228y^2 - 224y + 64$
c_4, c_{12}	$y^6 - 22y^5 + 149y^4 - 266y^3 + 146y^2 - 32y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = -1.276330 - 0.394337I$ $b = \ \ 0.613967 - 0.167943I$	$-10.98310 - 5.65624I$	$-13.0195 + 5.9589I$
$u = -0.215080 + 1.307140I$ $a = \ \ 2.49141 - 0.91280I$ $b = -3.15376 + 0.35052I$	$-10.98310 - 5.65624I$	$-13.0195 + 5.9589I$
$u = -0.215080 - 1.307140I$ $a = -1.276330 + 0.394337I$ $b = \ \ 0.613967 + 0.167943I$	$-10.98310 + 5.65624I$	$-13.0195 - 5.9589I$
$u = -0.215080 - 1.307140I$ $a = \ \ 2.49141 + 0.91280I$ $b = -3.15376 - 0.35052I$	$-10.98310 + 5.65624I$	$-13.0195 - 5.9589I$
$u = -0.569840$ $a = \ \ 1.51738$ $b = -0.192667$	-2.70789	0.0390210
$u = -0.569840$ $a = \ \ 0.0524558$ $b = \ \ 1.27226$	-2.70789	0.0390210

IV. $\boldsymbol{I_4^u = \langle -u^6 - u^5 - 2u^4 - u^3 - 2u^2 + b - u - 1,\ u^6 + u^5 + 2u^4 + u^3 + 3u^2 + a + u + 2,\ u^7 + u^6 + 3u^5 + 2u^4 + 4u^3 + 2u^2 + 3u + 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^6 - u^5 - 2u^4 - u^3 - 3u^2 - u - 2 \\ u^6 + u^5 + 2u^4 + u^3 + 2u^2 + u + 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^6 - 2u^4 - 3u^2 - 2 \\ -u^3 - u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 2u^6 + u^5 + 4u^4 + u^3 + 5u^2 + u + 3 \\ -u^6 - u^5 - 2u^4 - u^3 - 2u^2 - u - 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^6 + 2u^4 + 3u^2 + 2 \\ -u^6 - u^5 - 2u^4 - u^3 - 2u^2 - u - 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^6 + 2u^4 + 3u^2 - u + 1 \\ -u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u^5 + 2u^3 + 2u - 1 \\ -u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^5 + 2u^3 + 3u - 1 \\ -u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2u^6 - 4u^3 - 4u^2 - 2u - 11$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^7 - 5u^6 + 13u^5 - 22u^4 + 24u^3 - 16u^2 + 5u + 1$
c_2, c_7	$u^7 - u^6 + 3u^5 - 2u^4 + 4u^3 - 2u^2 + 3u - 1$
c_3, c_8	$u^7 + u^6 - 4u^5 - 4u^4 + 6u^3 + 3u^2 - 3u + 1$
c_4	$u^7 + u^6 - u^4 + 3u^3 - 4u^2 + 2u - 1$
c_5, c_9	$u^7 - u^6 - 4u^5 + 4u^4 + 6u^3 - 3u^2 - 3u - 1$
c_6, c_{11}	$u^7 + u^6 + 3u^5 + 2u^4 + 4u^3 + 2u^2 + 3u + 1$
c_{12}	$u^7 - u^6 + u^4 + 3u^3 + 4u^2 + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^7 + y^6 - 3y^5 - 10y^4 + 12y^3 + 28y^2 + 57y - 1$
c_2, c_6, c_7 c_{11}	$y^7 + 5y^6 + 13y^5 + 22y^4 + 24y^3 + 16y^2 + 5y - 1$
c_3, c_5, c_8 c_9	$y^7 - 9y^6 + 36y^5 - 76y^4 + 82y^3 - 37y^2 + 3y - 1$
c_4, c_{12}	$y^7 - y^6 + 8y^5 + 11y^4 + 3y^3 - 6y^2 - 4y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.537424 + 0.962927I$ $a = -0.662429 - 0.173919I$ $b = 0.300834 - 0.861081I$	$-0.10098 + 4.46523I$	$-0.57946 - 5.51833I$
$u = 0.537424 - 0.962927I$ $a = -0.662429 + 0.173919I$ $b = 0.300834 + 0.861081I$	$-0.10098 - 4.46523I$	$-0.57946 + 5.51833I$
$u = -0.132251 + 1.213860I$ $a = 1.92214 - 0.71131I$ $b = -1.46616 + 1.03238I$	$-10.69670 - 3.59676I$	$-12.51315 + 1.73858I$
$u = -0.132251 - 1.213860I$ $a = 1.92214 + 0.71131I$ $b = -1.46616 - 1.03238I$	$-10.69670 + 3.59676I$	$-12.51315 - 1.73858I$
$u = -0.723592 + 0.997572I$ $a = -0.752025 + 0.832832I$ $b = 0.223589 + 0.610838I$	$-3.82765 - 5.64420I$	$-9.10487 + 5.57424I$
$u = -0.723592 - 0.997572I$ $a = -0.752025 - 0.832832I$ $b = 0.223589 - 0.610838I$	$-3.82765 + 5.64420I$	$-9.10487 - 5.57424I$
$u = -0.363162$ $a = -2.01537$ $b = 0.883481$	-3.64806	-10.6050

V. $\boldsymbol{I_5^u =}$
$\boldsymbol{\langle -2u^2a-au-2u^2+b-2a-u-4,\ 2u^2a+a^2+2u^2+3a+2u+4,\ u^3+u^2+2u+1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ -u^2-u-1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a \\ 2u^2a+au+2u^2+2a+u+4 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^2a+au-u^2+a-1 \\ u^2a+au+u^2+2a+2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2-2u-1 \\ u^2+2u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^2a+4u^2+2a+2u+7 \\ -u^2a-2u^2-2a-2u-4 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 2u^2+3 \\ -u^2a-2u^2-2a-2u-4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 4u^2a+2au+8u^2+8a+3u+14 \\ u^2a+2u^2+a+u+4 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u^2a+u^2+2a+1 \\ 2u^2a+au+3u^2+3a+u+5 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^2a-au-2u^2-a-u-4 \\ 2u^2a+au+3u^2+3a+u+5 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^2a+4au+8u^2+8a+4u+6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^3 + 3u^2 + 2u - 1)^2$
c_2, c_6, c_7 c_{11}	$(u^3 + u^2 + 2u + 1)^2$
c_3, c_9, c_{12}	$(u^3 - u^2 - 4u + 5)^2$
c_4	$u^6 + u^5 + 6u^4 - 3u^3 + 10u^2 + 8$
c_5, c_8	$(u^3 + u^2 - 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^3 - 5y^2 + 10y - 1)^2$
c_2, c_6, c_7 c_{11}	$(y^3 + 3y^2 + 2y - 1)^2$
c_3, c_9, c_{12}	$(y^3 - 9y^2 + 26y - 25)^2$
c_4	$y^6 + 11y^5 + 62y^4 + 127y^3 + 196y^2 + 160y + 64$
c_5, c_8	$(y^3 - y^2 + 2y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.215080+1.307140I$ $a=\ \ 0.824718-0.424452I$ $b=-0.732199+0.986732I$	$-6.84548-2.82812I$	$-6.49024+2.97945I$
$u=-0.215080+1.307140I$ $a=-0.50000+1.54901I$ $b=\ \ 0.94728-2.29387I$	-10.9831	$-13.01951+0.I$
$u=-0.215080-1.307140I$ $a=\ \ 0.824718+0.424452I$ $b=-0.732199-0.986732I$	$-6.84548+2.82812I$	$-6.49024-2.97945I$
$u=-0.215080-1.307140I$ $a=-0.50000-1.54901I$ $b=\ \ 0.94728+2.29387I$	-10.9831	$-13.01951+0.I$
$u=-0.569840$ $a=-1.82472+0.42445I$ $b=\ \ 0.284920+0.882689I$	$-6.84548-2.82812I$	$-6.49024+2.97945I$
$u=-0.569840$ $a=-1.82472-0.42445I$ $b=\ \ 0.284920-0.882689I$	$-6.84548+2.82812I$	$-6.49024-2.97945I$

VI. $\boldsymbol{I_6^u = \langle -u^2a + 2u^2 + 2b + u + 3,\ a^2 + 3u^2 + 3u + 2,\ u^3 + u^2 + 2u + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^2a + 2u^2 + 2a + 2u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^3+3u^2+2u-1)^2$
c_2, c_6, c_7 c_{11}	$(u^3+u^2+2u+1)^2$
c_3, c_9	$(u^3+u^2-1)^2$
c_4, c_5, c_8	$(u^3-u^2-4u+5)^2$
c_{12}	$u^6+u^5+6u^4-3u^3+10u^2+8$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^3 - 5y^2 + 10y - 1)^2$
c_2, c_6, c_7 c_{11}	$(y^3 + 3y^2 + 2y - 1)^2$
c_3, c_9	$(y^3 - y^2 + 2y - 1)^2$
c_4, c_5, c_8	$(y^3 - 9y^2 + 26y - 25)^2$
c_{12}	$y^6 + 11y^5 + 62y^4 + 127y^3 + 196y^2 + 160y + 64$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.215080+1.307140I$ $a=\ \ 1.98708-0.56228I$ $b=-1.53980-0.18258I$	-10.9831	$-13.01951+0.I$
$u=-0.215080+1.307140I$ $a=-1.98708+0.56228I$ $b=\ \ 2.07960$	$-6.84548-2.82812I$	$-6.49024+2.97945I$
$u=-0.215080-1.307140I$ $a=\ \ 1.98708+0.56228I$ $b=-1.53980+0.18258I$	-10.9831	$-13.01951+0.I$
$u=-0.215080-1.307140I$ $a=-1.98708-0.56228I$ $b=\ \ 2.07960$	$-6.84548+2.82812I$	$-6.49024-2.97945I$
$u=-0.569840$ $a=\ \ 1.124560I$ $b=-1.53980+0.18258I$	$-6.84548-2.82812I$	$-6.49024+2.97945I$
$u=-0.569840$ $a=\ \ -1.124560I$ $b=-1.53980-0.18258I$	$-6.84548+2.82812I$	$-6.49024-2.97945I$

VII. $\boldsymbol{I^u_7 = \langle u^6 + u^5 + 2u^4 + u^3 + u^2 + b + u + 1,\ -2u^7 - 2u^6 + \cdots + a - 1,\ u^8 + u^7 + 3u^6 + 2u^5 + 3u^4 + 2u^3 + 3u^2 + u + 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 2u^7 + 2u^6 + 5u^5 + 3u^4 + 3u^3 + 3u^2 + 4u + 1 \\ -u^6 - u^5 - 2u^4 - u^3 - u^2 - u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^7 + u^6 + 2u^5 + u^4 + u^3 + u^2 + 2u \\ -u^7 - 2u^6 - 3u^5 - 4u^4 - 2u^3 - 3u^2 - 2u - 2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 2u^7 + 3u^6 + 6u^5 + 5u^4 + 5u^3 + 4u^2 + 6u + 3 \\ -u^6 - u^5 - 2u^4 - u^3 - u^2 - u - 2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 2u^7 + 2u^6 + 5u^5 + 3u^4 + 4u^3 + 3u^2 + 5u + 1 \\ -u^6 - u^5 - 2u^4 - u^3 - u^2 - u - 2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -3u^6 - 2u^5 - 7u^4 - 3u^3 - 5u^2 - 3u - 5 \\ -u^7 - 2u^5 + u^4 - u^3 + u^2 - u + 2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -2u^7 - u^6 - 4u^5 - u^4 - 2u^3 - u^2 - 3u + 1 \\ u^7 + u^6 + 3u^5 + 2u^4 + 3u^3 + 2u^2 + 3u + 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -3u^7 - 2u^6 - 7u^5 - 3u^4 - 5u^3 - 3u^2 - 6u \\ u^7 + u^6 + 3u^5 + 2u^4 + 3u^3 + 2u^2 + 3u + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u^7 - 4u^6 - 5u^5 - 10u^4 - 7u^3 - 7u^2 - 5u - 14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^8 - 5u^7 + 11u^6 - 16u^5 + 19u^4 - 16u^3 + 11u^2 - 5u + 1$
c_2, c_7	$u^8 - u^7 + 3u^6 - 2u^5 + 3u^4 - 2u^3 + 3u^2 - u + 1$
c_3, c_8	$(u^4 - u^3 - 2u^2 + 2u + 1)^2$
c_4	$u^8 - 4u^7 + 5u^6 - u^5 - u^4 - u^3 + 4u^2 - 3u + 1$
c_5, c_9	$(u^4 + u^3 - 2u^2 - 2u + 1)^2$
c_6, c_{11}	$u^8 + u^7 + 3u^6 + 2u^5 + 3u^4 + 2u^3 + 3u^2 + u + 1$
c_{12}	$u^8 + 4u^7 + 5u^6 + u^5 - u^4 + u^3 + 4u^2 + 3u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^8 - 3y^7 - y^6 + 24y^5 + 43y^4 + 24y^3 - y^2 - 3y + 1$
c_2, c_6, c_7 c_{11}	$y^8 + 5y^7 + 11y^6 + 16y^5 + 19y^4 + 16y^3 + 11y^2 + 5y + 1$
c_3, c_5, c_8 c_9	$(y^4 - 5y^3 + 10y^2 - 8y + 1)^2$
c_4, c_{12}	$y^8 - 6y^7 + 15y^6 - 11y^5 + 17y^4 - 5y^3 + 8y^2 - y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_7^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.589362 + 0.807869I$ $a = 0.618883 - 0.314577I$ $b = 0.500000 + 0.685376I$	0.398187	$-4.14403 + 0.I$
$u = 0.589362 - 0.807869I$ $a = 0.618883 + 0.314577I$ $b = 0.500000 - 0.685376I$	0.398187	$-4.14403 + 0.I$
$u = -0.756438 + 0.654065I$ $a = 0.313901 - 0.842956I$ $b = 0.500000 - 0.432332I$	-2.83064	$-8.01125 + 0.I$
$u = -0.756438 - 0.654065I$ $a = 0.313901 + 0.842956I$ $b = 0.500000 + 0.432332I$	-2.83064	$-8.01125 + 0.I$
$u = -0.112930 + 0.707515I$ $a = -0.42892 + 2.19402I$ $b = -0.779254 - 0.555127I$	$-8.65338 + 2.52742I$	$-12.42236 - 1.86858I$
$u = -0.112930 - 0.707515I$ $a = -0.42892 - 2.19402I$ $b = -0.779254 + 0.555127I$	$-8.65338 - 2.52742I$	$-12.42236 + 1.86858I$
$u = -0.219994 + 1.378280I$ $a = -1.50387 + 0.55124I$ $b = 1.77925 - 0.55513I$	$-8.65338 - 2.52742I$	$-12.42236 + 1.86858I$
$u = -0.219994 - 1.378280I$ $a = -1.50387 - 0.55124I$ $b = 1.77925 + 0.55513I$	$-8.65338 + 2.52742I$	$-12.42236 - 1.86858I$

VIII. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$((u^3+3u^2+2u-1)^6)(u^7-5u^6+\cdots+5u+1)$ $\cdot(u^7+5u^6+9u^5-2u^4-24u^3-24u^2-7u-1)$ $\cdot(u^8-5u^7+11u^6-16u^5+19u^4-16u^3+11u^2-5u+1)$ $\cdot(u^{14}+8u^{13}+\cdots+240u+64)$
c_2, c_7	$(u^3+u^2+2u+1)^6(u^7-3u^6+7u^5-10u^4+10u^3-8u^2+3u-1)$ $\cdot(u^7-u^6+3u^5-2u^4+4u^3-2u^2+3u-1)$ $\cdot(u^8-u^7+3u^6-2u^5+3u^4-2u^3+3u^2-u+1)$ $\cdot(u^{14}-6u^{13}+\cdots-28u+8)$
c_3, c_8	$(u^3-u^2-4u+5)^2(u^3+u^2-1)^2(u^4-u^3-2u^2+2u+1)^2$ $\cdot(u^6+u^5-2u^4+5u^3+14u^2-8)(u^7-2u^6-3u^5+7u^4-3u^2+1)^2$ $\cdot(u^7+u^6-4u^5-4u^4+6u^3+3u^2-3u+1)$ $\cdot(u^7+5u^6+8u^5+4u^4+2u^3+5u^2+3u+1)$
c_4	$(u^3-u^2-4u+5)^2(u^6-4u^5-3u^4+14u^3+14u^2+2u-1)$ $\cdot(u^6+u^5+6u^4-3u^3+10u^2+8)$ $\cdot(u^7-u^6-8u^5+5u^4+21u^3+14u^2+4u+1)$ $\cdot(u^7+u^6-u^4+3u^3-4u^2+2u-1)$ $\cdot(u^8-4u^7+5u^6-u^5-u^4-u^3+4u^2-3u+1)$ $\cdot(u^{14}-2u^{13}+\cdots+15u+1)$
c_5, c_9	$(u^3-u^2-4u+5)^2(u^3+u^2-1)^2(u^4+u^3-2u^2-2u+1)^2$ $\cdot(u^6+u^5-2u^4+5u^3+14u^2-8)(u^7-2u^6-3u^5+7u^4-3u^2+1)^2$ $\cdot(u^7-u^6-4u^5+4u^4+6u^3-3u^2-3u-1)$ $\cdot(u^7+5u^6+8u^5+4u^4+2u^3+5u^2+3u+1)$
c_6, c_{11}	$(u^3+u^2+2u+1)^6(u^7-3u^6+7u^5-10u^4+10u^3-8u^2+3u-1)$ $\cdot(u^7+u^6+3u^5+2u^4+4u^3+2u^2+3u+1)$ $\cdot(u^8+u^7+3u^6+2u^5+3u^4+2u^3+3u^2+u+1)$ $\cdot(u^{14}-6u^{13}+\cdots-28u+8)$
c_{12}	$(u^3-u^2-4u+5)^2(u^6-4u^5-3u^4+14u^3+14u^2+2u-1)$ $\cdot(u^6+u^5+6u^4-3u^3+10u^2+8)(u^7-u^6+u^4+3u^3+4u^2+2u+1)$ $\cdot(u^7-u^6-8u^5+5u^4+21u^3+14u^2+4u+1)$ $\cdot(u^8+4u^7+5u^6+u^5-u^4+u^3+4u^2+3u+1)$ $\cdot(u^{14}-2u^{13}+\cdots+15u+1)$

IX. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^3 - 5y^2 + 10y - 1)^6$ $\cdot (y^7 - 7y^6 + 53y^5 - 210y^4 + 364y^3 - 244y^2 + y - 1)$ $\cdot (y^7 + y^6 - 3y^5 - 10y^4 + 12y^3 + 28y^2 + 57y - 1)$ $\cdot (y^8 - 3y^7 - y^6 + 24y^5 + 43y^4 + 24y^3 - y^2 - 3y + 1)$ $\cdot (y^{14} + 72y^{12} + \cdots + 13056y + 4096)$
c_2, c_6, c_7 c_{11}	$(y^3 + 3y^2 + 2y - 1)^6(y^7 + 5y^6 + 9y^5 - 2y^4 - 24y^3 - 24y^2 - 7y - 1)$ $\cdot (y^7 + 5y^6 + 13y^5 + 22y^4 + 24y^3 + 16y^2 + 5y - 1)$ $\cdot (y^8 + 5y^7 + 11y^6 + 16y^5 + 19y^4 + 16y^3 + 11y^2 + 5y + 1)$ $\cdot (y^{14} + 8y^{13} + \cdots + 240y + 64)$
c_3, c_5, c_8 c_9	$(y^3 - 9y^2 + 26y - 25)^2(y^3 - y^2 + 2y - 1)^2$ $\cdot (y^4 - 5y^3 + 10y^2 - 8y + 1)^2$ $\cdot (y^6 - 5y^5 + 22y^4 - 97y^3 + 228y^2 - 224y + 64)$ $\cdot (y^7 - 10y^6 + 37y^5 - 61y^4 + 46y^3 - 23y^2 + 6y - 1)^2$ $\cdot (y^7 - 9y^6 + 28y^5 - 28y^4 + 2y^3 - 21y^2 - y - 1)$ $\cdot (y^7 - 9y^6 + 36y^5 - 76y^4 + 82y^3 - 37y^2 + 3y - 1)$
c_4, c_{12}	$(y^3 - 9y^2 + 26y - 25)^2$ $\cdot (y^6 - 22y^5 + 149y^4 - 266y^3 + 146y^2 - 32y + 1)$ $\cdot (y^6 + 11y^5 + 62y^4 + 127y^3 + 196y^2 + 160y + 64)$ $\cdot (y^7 - 17y^6 + 116y^5 - 325y^4 + 239y^3 - 38y^2 - 12y - 1)$ $\cdot (y^7 - y^6 + 8y^5 + 11y^4 + 3y^3 - 6y^2 - 4y - 1)$ $\cdot (y^8 - 6y^7 + 15y^6 - 11y^5 + 17y^4 - 5y^3 + 8y^2 - y + 1)$ $\cdot (y^{14} - 24y^{13} + \cdots - 53y + 1)$