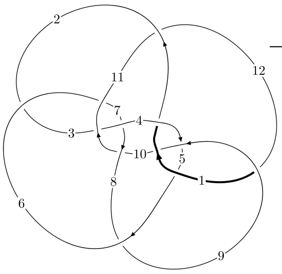
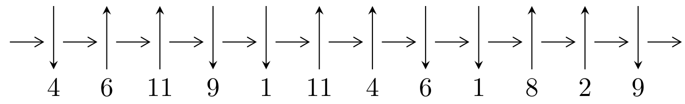
$12n_{0706}$ $(K12n_{0706})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u &= \langle u^3 + 2u^2 + 2b + u,\ -u^2 + 2a - 2u - 1,\ u^4 + 2u^3 + 2u^2 - 2u + 1\rangle \\
I_2^u &= \langle u^5 - u^4 - 2u^2 + 4b + 3u - 1,\ u^5 + u^4 - 2u^3 + 12a - 3u + 7,\ u^6 - 2u^5 + u^4 + 3u^2 - 2u + 3\rangle \\
I_3^u &= \langle u^5 - 2u^4 - u^3 + 5u^2 + 2b + 3u - 4,\ -2u^5 + 2u^4 + 3u^3 - 7u^2 + 6a - 6u + 3,\ u^6 - 2u^5 - u^4 + 6u^3 - 6u + 3\rangle \\
I_4^u &= \langle 2u^5 - u^4 - 5u^3 + 6u^2 + 6b + 9u - 6,\ -4u^5 + 5u^4 + 10u^3 - 21u^2 + 6a - 15u + 15, \\
&\qquad u^6 - 2u^5 - u^4 + 6u^3 - 6u + 3\rangle \\
I_5^u &= \langle -99u^5 - 258u^4 - 363u^3 - 295u^2 + 82b - 59u - 72, \\
&\qquad -81u^5 - 144u^4 - 174u^3 - 96u^2 + 82a - 11u - 85,\ 9u^6 + 27u^5 + 48u^4 + 51u^3 + 34u^2 + 16u + 8\rangle \\
I_6^u &= \langle b - a,\ a^2 + a - 1,\ u + 1\rangle \\
I_7^u &= \langle -a^2u^2 + au + b - a - u + 1,\ u^3a^2 + au + u^2 - u + 1\rangle
\end{aligned}
$$

* 6 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 representations.
* 1 irreducible components of $\dim_{\mathbb{C}} = 1$

[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. $\boldsymbol{I_1^u = \langle u^3 + 2u^2 + 2b + u,\ -u^2 + 2a - 2u - 1,\ u^4 + 2u^3 + 2u^2 - 2u + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 3u^3 + 9u^2 + 9u - 3$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.366025 + 0.366025I$ $a = 0.866025 + 0.500000I$ $b = -0.133975 - 0.500000I$	$-1.23808I$	$0. + 6.00000I$
$u = 0.366025 - 0.366025I$ $a = 0.866025 - 0.500000I$ $b = -0.133975 + 0.500000I$	$1.23808I$	$0. - 6.00000I$
$u = -1.36603 + 1.36603I$ $a = -0.866025 - 0.500000I$ $b = -1.86603 + 0.50000I$	$13.4174I$	$0. - 6.00000I$
$u = -1.36603 - 1.36603I$ $a = -0.866025 + 0.500000I$ $b = -1.86603 - 0.50000I$	$-13.4174I$	$0. + 6.00000I$

II. $\boldsymbol{I_2^u = \langle u^5 - u^4 - 2u^2 + 4b + 3u - 1,\ u^5 + u^4 - 2u^3 + 12a - 3u + 7,\ u^6 - 2u^5 + u^4 + 3u^2 - 2u + 3\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^5 - \frac{9}{2}u^4 + 3u^2 + 6u - \frac{3}{2}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8, c_{10} c_{11}	$y^6 - 2y^5 + 7y^4 + 4y^3 + 15y^2 + 14y + 9$
c_2, c_3, c_4 c_5, c_6, c_7 c_9, c_{12}	$y^6 - 5y^5 + 2y^4 + 15y^3 + 10y^2 + 3y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.319448 + 0.816851I$ $a = -0.649948 + 0.216712I$ $b = -0.384646 - 0.461682I$	$-3.01792I$	$0. + 8.67149I$
$u = 0.319448 - 0.816851I$ $a = -0.649948 - 0.216712I$ $b = -0.384646 + 0.461682I$	$3.01792I$	$0. - 8.67149I$
$u = -0.814644 + 0.831311I$ $a = -0.562136 + 0.513813I$ $b = 0.030802 - 0.885884I$	$9.18468 + 5.87764I$	$6.07806 - 4.16480I$
$u = -0.814644 - 0.831311I$ $a = -0.562136 - 0.513813I$ $b = 0.030802 + 0.885884I$	$9.18468 - 5.87764I$	$6.07806 + 4.16480I$
$u = 1.49520 + 0.80186I$ $a = 1.045420 - 0.362585I$ $b = 1.85384 + 0.29614I$	$-9.18468 - 5.87764I$	$-6.07806 + 4.16480I$
$u = 1.49520 - 0.80186I$ $a = 1.045420 + 0.362585I$ $b = 1.85384 - 0.29614I$	$-9.18468 + 5.87764I$	$-6.07806 - 4.16480I$

III. $I_3^u = \langle u^5 - 2u^4 - u^3 + 5u^2 + 2b + 3u - 4,\ -2u^5 + 2u^4 + 3u^3 - 7u^2 + 6a - 6u + 3,\ u^6 - 2u^5 - u^4 + 6u^3 - 6u + 3\rangle$

(i) Arc colorings

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

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

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

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

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

$$a_6 = \begin{pmatrix} -\frac{1}{2}u^5 + \frac{1}{2}u^4 + \cdots - \frac{7}{3}u + 2 \\ \frac{1}{3}u^5 - \frac{1}{6}u^4 + \cdots + \frac{3}{2}u - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{5}{6}u^5 - \frac{4}{3}u^4 + \cdots + \frac{5}{2}u - \frac{5}{2} \\ -\frac{1}{2}u^5 + u^4 + \cdots - \frac{3}{2}u + 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{5}{6}u^5 - \frac{7}{6}u^4 + \cdots + 2u - 2 \\ -u^5 + \frac{3}{2}u^4 + \frac{3}{2}u^3 - 4u^2 - \frac{5}{2}u + 3 \end{pmatrix}$$

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

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

$$a_7 = \begin{pmatrix} -\frac{5}{6}u^5 + \frac{7}{6}u^4 + \cdots - 2u + 2 \\ \frac{1}{2}u^5 - \frac{1}{2}u^4 + \cdots + 2u - \frac{3}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{1}{3}u^5 - \frac{2}{3}u^4 + \frac{4}{3}u^2 - \frac{1}{3}u \\ -\frac{1}{6}u^5 + \frac{1}{3}u^4 + \cdots + \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{10}{3}u^5 - 4u^4 - \frac{22}{3}u^3 + \frac{50}{3}u^2 + \frac{38}{3}u - 14$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8, c_{10} c_{11}	$y^6 - 6y^5 + 25y^4 - 54y^3 + 66y^2 - 36y + 9$
c_2, c_7, c_9 c_{12}	$y^6 - y^5 - 14y^4 + 7y^3 + 136y^2 + 176y + 64$
c_3, c_4, c_5 c_6	$9(9y^6 - 54y^5 + 93y^4 - 18y^3 + 10y^2 + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.696323 + 0.248902I$ $a = 0.555352 + 0.455182I$ $b = 0.077086 - 0.882809I$	$-1.15875I$	$0. + 5.94444I$
$u = 0.696323 - 0.248902I$ $a = 0.555352 - 0.455182I$ $b = 0.077086 + 0.882809I$	$1.15875I$	$0. - 5.94444I$
$u = -1.213080 + 0.431565I$ $a = 0.317354 + 0.363091I$ $b = 0.36468 - 1.56135I$	$7.57044 + 5.49399I$	$-0.42147 - 2.91709I$
$u = -1.213080 - 0.431565I$ $a = 0.317354 - 0.363091I$ $b = 0.36468 + 1.56135I$	$7.57044 - 5.49399I$	$-0.42147 + 2.91709I$
$u = 1.51676 + 1.00438I$ $a = -0.872706 + 0.406269I$ $b = -1.94177 - 0.43842I$	$-7.57044 - 5.49399I$	$0.42147 + 2.91709I$
$u = 1.51676 - 1.00438I$ $a = -0.872706 - 0.406269I$ $b = -1.94177 + 0.43842I$	$-7.57044 + 5.49399I$	$0.42147 - 2.91709I$

IV. $\boldsymbol{I_4^u = \langle 2u^5 - u^4 - 5u^3 + 6u^2 + 6b + 9u - 6,\ -4u^5 + 5u^4 + 10u^3 - 21u^2 + 6a - 15u + 15,\ u^6 - 2u^5 - u^4 + 6u^3 - 6u + 3\rangle}$

(i) Arc colorings

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

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

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

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

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

$$a_6 = \begin{pmatrix} -\frac{1}{2}u^5 + u^4 + \cdots - \frac{1}{2}u + 2 \\ \frac{1}{3}u^5 - \frac{1}{6}u^4 + \cdots + \frac{3}{2}u - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^5 - u^4 - \frac{5}{2}u^3 + \frac{9}{2}u^2 + 4u - \frac{7}{2} \\ -\frac{1}{3}u^5 + \frac{1}{6}u^4 + \cdots - \frac{3}{2}u + 1 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} \frac{1}{3}u^5 - \frac{1}{3}u^4 + \cdots + u - \frac{1}{2} \\ \frac{1}{3}u^4 - \frac{1}{6}u^3 - \frac{5}{6}u^2 + \frac{1}{2} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{5}{6}u^5 - \frac{7}{6}u^4 + \cdots + 2u - 2 \\ -\frac{1}{6}u^4 - \frac{1}{6}u^3 + \frac{2}{3}u^2 - \frac{1}{2}u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{1}{3}u^5 + \frac{1}{3}u^4 + u^3 - \frac{5}{3}u^2 - 2u + 2 \\ \frac{1}{3}u^5 - \frac{1}{3}u^4 + \cdots + \frac{1}{3}u - \frac{1}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{6}u^5 - \frac{1}{6}u^4 + \cdots - 2u + \frac{5}{2} \\ -\frac{1}{6}u^4 + \frac{1}{3}u^3 + \cdots - \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{10}{3}u^5 - 4u^4 - \frac{22}{3}u^3 + \frac{50}{3}u^2 + \frac{38}{3}u - 14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^6 + 2u^5 - u^4 - 6u^3 + 6u + 3$
c_2, c_6, c_7	$3(3u^6 + 12u^5 + 15u^4 + 6u^3 + 2u^2 + 2u + 1)$
c_3	$u^6 - 3u^5 + 4u^4 - 9u^3 + 12u^2 - 4u + 8$
c_4	$u^6 + 3u^5 + 4u^4 + 9u^3 + 12u^2 + 4u + 8$
c_5, c_9, c_{12}	$3(3u^6 - 12u^5 + 15u^4 - 6u^3 + 2u^2 - 2u + 1)$
c_8	$9(9u^6 - 27u^5 + 48u^4 - 51u^3 + 34u^2 - 16u + 8)$
c_{10}	$u^6 - 2u^5 - u^4 + 6u^3 - 6u + 3$
c_{11}	$9(9u^6 + 27u^5 + 48u^4 + 51u^3 + 34u^2 + 16u + 8)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^6 - 6y^5 + 25y^4 - 54y^3 + 66y^2 - 36y + 9$
c_2, c_5, c_6 c_7, c_9, c_{12}	$9(9y^6 - 54y^5 + 93y^4 - 18y^3 + 10y^2 + 1)$
c_3, c_4	$y^6 - y^5 - 14y^4 + 7y^3 + 136y^2 + 176y + 64$
c_8, c_{11}	$81(81y^6 + 135y^5 + 162y^4 - 57y^3 + 292y^2 + 288y + 64)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.696323 + 0.248902I$ $a = 0.303677 + 1.159270I$ $b = -0.273409 - 0.455182I$	$-1.15875I$	$0. + 5.94444I$
$u = 0.696323 - 0.248902I$ $a = 0.303677 - 1.159270I$ $b = -0.273409 + 0.455182I$	$1.15875I$	$0. - 5.94444I$
$u = -1.213080 + 0.431565I$ $a = 0.673303 - 1.047560I$ $b = 0.541674 + 0.303500I$	$7.57044 + 5.49399I$	$-0.42147 - 2.91709I$
$u = -1.213080 - 0.431565I$ $a = 0.673303 + 1.047560I$ $b = 0.541674 - 0.303500I$	$7.57044 - 5.49399I$	$-0.42147 + 2.91709I$
$u = 1.51676 + 1.00438I$ $a = 1.023020 - 0.388387I$ $b = 1.73174 + 0.26032I$	$-7.57044 - 5.49399I$	$0.42147 + 2.91709I$
$u = 1.51676 - 1.00438I$ $a = 1.023020 + 0.388387I$ $b = 1.73174 - 0.26032I$	$-7.57044 + 5.49399I$	$0.42147 - 2.91709I$

V. $\boldsymbol{I^u_5 = \langle -99u^5 - 258u^4 + \cdots + 82b - 72,\ -81u^5 - 144u^4 + \cdots + 82a - 85,\ 9u^6 + 27u^5 + 48u^4 + 51u^3 + 34u^2 + 16u + 8\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.987805u^5 + 1.75610u^4 + \cdots + 0.134146u + 1.03659 \\ 1.20732u^5 + 3.14634u^4 + \cdots + 0.719512u + 0.878049 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 2.41463u^5 + 5.54268u^4 + \cdots + 2.18902u + 1.75610 \\ 1.70122u^5 + 4.77439u^4 + \cdots + 3.53659u + 2.14634 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.713415u^5 + 0.768293u^4 + \cdots - 1.34756u - 0.390244 \\ 1.70122u^5 + 4.77439u^4 + \cdots + 3.53659u + 2.14634 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.219512u^5 - 1.39024u^4 + \cdots - 0.585366u + 0.158537 \\ 1.20732u^5 + 3.14634u^4 + \cdots + 0.719512u + 0.878049 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1.04268u^5 - 2.85366u^4 + \cdots - 0.530488u - 0.121951 \\ 1.26220u^5 + 1.99390u^4 + \cdots - 0.634146u - 0.536585 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -2.41463u^5 - 5.54268u^4 + \cdots - 2.18902u - 0.756098 \\ -1.70122u^5 - 4.77439u^4 + \cdots - 2.53659u - 2.14634 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -1.04268u^5 - 2.85366u^4 + \cdots - 0.530488u - 0.121951 \\ -0.457317u^5 - 0.896341u^4 + \cdots - 1.21951u - 0.878049 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1.04268u^5 + 2.85366u^4 + \cdots + 0.530488u + 0.121951 \\ -2.17683u^5 - 3.78659u^4 + \cdots + 0.195122u + 0.780488 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.466463u^5 + 1.45427u^4 + \cdots + 0.243902u + 0.475610 \\ -1.26220u^5 - 3.49390u^4 + \cdots - 0.865854u - 0.463415 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{69}{41}u^5 - \frac{27}{41}u^4 + \frac{116}{41}u^3 + \frac{433}{41}u^2 + \frac{390}{41}u + \frac{166}{41}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$9(9u^6 - 27u^5 + 48u^4 - 51u^3 + 34u^2 - 16u + 8)$
c_2, c_3, c_7	$3(3u^6 + 12u^5 + 15u^4 + 6u^3 + 2u^2 + 2u + 1)$
c_4, c_9, c_{12}	$3(3u^6 - 12u^5 + 15u^4 - 6u^3 + 2u^2 - 2u + 1)$
c_5	$u^6 + 3u^5 + 4u^4 + 9u^3 + 12u^2 + 4u + 8$
c_6	$u^6 - 3u^5 + 4u^4 - 9u^3 + 12u^2 - 4u + 8$
c_8	$u^6 + 2u^5 - u^4 - 6u^3 + 6u + 3$
c_{10}	$9(9u^6 + 27u^5 + 48u^4 + 51u^3 + 34u^2 + 16u + 8)$
c_{11}	$u^6 - 2u^5 - u^4 + 6u^3 - 6u + 3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$81(81y^6 + 135y^5 + 162y^4 - 57y^3 + 292y^2 + 288y + 64)$
c_2, c_3, c_4 c_7, c_9, c_{12}	$9(9y^6 - 54y^5 + 93y^4 - 18y^3 + 10y^2 + 1)$
c_5, c_6	$y^6 - y^5 - 14y^4 + 7y^3 + 136y^2 + 176y + 64$
c_8, c_{11}	$y^6 - 6y^5 + 25y^4 - 54y^3 + 66y^2 - 36y + 9$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.989374 + 0.463198I$ $a = 1.53670 + 0.45632I$ $b = 1.73174 - 0.26032I$	$-7.57044 + 5.49399I$	$0.42147 - 2.91709I$
$u = -0.989374 - 0.463198I$ $a = 1.53670 - 0.45632I$ $b = 1.73174 + 0.26032I$	$-7.57044 - 5.49399I$	$0.42147 + 2.91709I$
$u = -0.565978 + 1.232560I$ $a = -0.036697 + 0.456322I$ $b = 0.541674 + 0.303500I$	$7.57044 + 5.49399I$	$-0.42147 - 2.91709I$
$u = -0.565978 - 1.232560I$ $a = -0.036697 - 0.456322I$ $b = 0.541674 - 0.303500I$	$7.57044 - 5.49399I$	$-0.42147 + 2.91709I$
$u = 0.055352 + 0.633907I$ $a = 0.750000 - 0.365819I$ $b = -0.273409 - 0.455182I$	$-1.15875I$	$0. + 5.94444I$
$u = 0.055352 - 0.633907I$ $a = 0.750000 + 0.365819I$ $b = -0.273409 + 0.455182I$	$1.15875I$	$0. - 5.94444I$

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = \quad 0.618034$ $b = \quad 0.618034$	3.94784	0
$u = -1.00000$ $a = -1.61803$ $b = -1.61803$	−3.94784	0

VII. $I_7^u = \langle -a^2u^2 + au + b - a - u + 1,\ u^3a^2 + au + u^2 - u + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_7^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$	0	0

VIII. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$9(u-1)^2(u^4-2u^3+2u^2+2u+1)(u^6-2u^5+u^4+3u^2-2u+3)$ $\cdot(u^6+2u^5-u^4-6u^3+6u+3)^2$ $\cdot(9u^6-27u^5+48u^4-51u^3+34u^2-16u+8)$
c_2, c_6	$9(u^2-u-1)(u^4-4u^3+\cdots-2u+1)(u^6-3u^5+\cdots+u+1)$ $\cdot(u^6-3u^5+4u^4-9u^3+12u^2-4u+8)$ $\cdot(3u^6+12u^5+15u^4+6u^3+2u^2+2u+1)^2$
c_3, c_7	$9(u^2-u-1)(u^4-4u^3+5u^2-2u+1)$ $\cdot(u^6-3u^5+4u^4-9u^3+12u^2-4u+8)$ $\cdot(u^6+3u^5+2u^4+u^3+2u^2-u+1)$ $\cdot(3u^6+12u^5+15u^4+6u^3+2u^2+2u+1)^2$
c_4, c_9	$9(u^2+u-1)(u^4+4u^3+\cdots+2u+1)(u^6+3u^5+\cdots-u+1)$ $\cdot(u^6+3u^5+4u^4+9u^3+12u^2+4u+8)$ $\cdot(3u^6-12u^5+15u^4-6u^3+2u^2-2u+1)^2$
c_5, c_{12}	$9(u^2+u-1)(u^4+4u^3+\cdots+2u+1)(u^6-3u^5+\cdots+u+1)$ $\cdot(u^6+3u^5+4u^4+9u^3+12u^2+4u+8)$ $\cdot(3u^6-12u^5+15u^4-6u^3+2u^2-2u+1)^2$
c_8	$9(u-1)^2(u^4-2u^3+2u^2+2u+1)(u^6+2u^5-u^4-6u^3+6u+3)^2$ $\cdot(u^6+2u^5+u^4+3u^2+2u+3)$ $\cdot(9u^6-27u^5+48u^4-51u^3+34u^2-16u+8)$
c_{10}	$9(u+1)^2(u^4+2u^3+2u^2-2u+1)(u^6-2u^5-u^4+6u^3-6u+3)^2$ $\cdot(u^6-2u^5+u^4+3u^2-2u+3)$ $\cdot(9u^6+27u^5+48u^4+51u^3+34u^2+16u+8)$
c_{11}	$9(u+1)^2(u^4+2u^3+2u^2-2u+1)(u^6-2u^5-u^4+6u^3-6u+3)^2$ $\cdot(u^6+2u^5+u^4+3u^2+2u+3)$ $\cdot(9u^6+27u^5+48u^4+51u^3+34u^2+16u+8)$

IX. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_8, c_{10} c_{11}	$81(y-1)^2(y^4+14y^2+1)(y^6-6y^5+\cdots-36y+9)^2$ $\cdot(y^6-2y^5+7y^4+4y^3+15y^2+14y+9)$ $\cdot(81y^6+135y^5+162y^4-57y^3+292y^2+288y+64)$
c_2, c_3, c_4 c_5, c_6, c_7 c_9, c_{12}	$81(y^2-3y+1)(y^4-6y^3+11y^2+6y+1)$ $\cdot(y^6-5y^5+2y^4+15y^3+10y^2+3y+1)$ $\cdot(y^6-y^5-14y^4+7y^3+136y^2+176y+64)$ $\cdot(9y^6-54y^5+93y^4-18y^3+10y^2+1)^2$