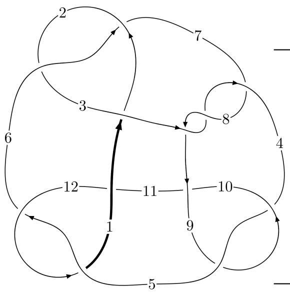
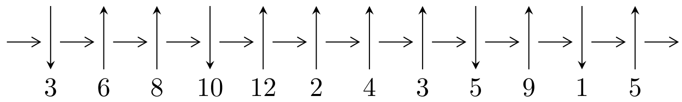
$12n_{0554}$ ($K12n_{0554}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$5{,}9 \underset{c_9}{\to} 10 \underset{c_4}{\to} 3{,}4 \underset{c_8}{\to} 1{,}8 \underset{c_{12}}{\to} 12 \underset{c_5}{\to} 6 \underset{c_2}{\longrightarrow} 2 \underset{c_6}{\longrightarrow} 7 \underset{c_{11}}{\to} 11 \longrightarrow\!\!\!\!\to c_1, c_3, c_7, c_{10}$$

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

$$\begin{aligned}
I_1^u = \langle & -u^5 - u^4 - 5u^3 - 5u^2 + 6d - 4u - 2,\ u^5 + u^4 - u^3 - u^2 + 12c - 8u - 4, \\
& -u^5 - 4u^4 - 5u^3 - 8u^2 + 6b - 4u - 2,\ u^5 + u^4 + 5u^3 - u^2 + 12a - 2u - 4, \\
& u^6 + 3u^5 + 7u^4 + 9u^3 + 8u^2 + 4u + 4\rangle \\
I_2^u = \langle & -u^3 + u^2 + 2d - 3u - 1,\ c + 1,\ b + u,\ u^3 - u^2 + 2a + 5u - 1,\ u^4 + 4u^2 + 2u + 1\rangle \\
I_3^u = \langle & -u^3 + u^2 + 2d - 3u - 1,\ c + 1,\ -u^3 - u^2 + 2b - 5u - 5,\ -u^3 + u^2 + 2a - 5u + 3,\ u^4 + 4u^2 + 2u + 1\rangle \\
I_4^u = \langle & u^3 - u^2 + 2d + 5u + 1,\ 5u^3 - u^2 + 2c + 19u + 5,\ b + u,\ u^3 - u^2 + 2a + 5u - 1,\ u^4 + 4u^2 + 2u + 1\rangle \\
I_5^u = \langle & d + 1,\ 2c - u - 1,\ b,\ a - 1,\ u^2 - u + 2\rangle \\
I_6^u = \langle & d + 1,\ 2c - u - 1,\ b - u + 1,\ 2a - u + 1,\ u^2 - u + 2\rangle \\
I_7^u = \langle & d - u,\ c,\ b - u + 1,\ 2a - u + 1,\ u^2 - u + 2\rangle \\
I_8^u = \langle & d + 1,\ c,\ b,\ a - 1,\ u + 1\rangle \\
I_9^u = \langle & d,\ c - u,\ b - u,\ a - 1,\ u^2 + 1\rangle \\
I_{10}^u = \langle & d - u,\ c - 1,\ b + 1,\ a,\ u^2 + 1\rangle
\end{aligned}$$

[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`).

$$I^u_{11} = \langle d-u,\ c-1,\ b-u,\ a-1,\ u^2+1\rangle$$
$$I^u_{12} = \langle d-u,\ cb-u+1,\ a-1,\ u^2+1\rangle$$

$$I^v_1 = \langle a,\ d-v,\ -av+c+1,\ b-1,\ v^2+1\rangle$$

* 12 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 33 representations.
* 1 irreducible components of $\dim_{\mathbb{C}} = 1$

[2] All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I. $\boldsymbol{I_1^u = \langle -u^5 - u^4 + \cdots + 6d - 2,\ u^5 + u^4 + \cdots + 12c - 4,\ -u^5 - 4u^4 + \cdots + 6b - 2,\ u^5 + u^4 + \cdots + 12a - 4,\ u^6 + 3u^5 + \cdots + 4u + 4\rangle}$

(i) Arc colorings

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

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

$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{12}u^5 - \frac{1}{12}u^4 + \cdots + \frac{2}{3}u + \frac{1}{3} \\ \frac{1}{6}u^5 + \frac{1}{6}u^4 + \cdots + \frac{2}{3}u + \frac{1}{3} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -\frac{1}{12}u^5 - \frac{1}{12}u^4 + \cdots + \frac{1}{6}u + \frac{1}{3} \\ \frac{1}{6}u^5 + \frac{2}{3}u^4 + \cdots + \frac{2}{3}u + \frac{1}{3} \end{pmatrix}$$

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

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

$$a_6 = \begin{pmatrix} \frac{1}{12}u^5 + \frac{7}{12}u^4 + \cdots + \frac{1}{3}u + \frac{2}{3} \\ -\frac{2}{3}u^5 - \frac{7}{6}u^4 + \cdots - \frac{2}{3}u - \frac{1}{3} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u^3 + u^2 + \frac{1}{2}u + 1 \\ \frac{1}{3}u^5 + \frac{5}{6}u^4 + \cdots + \frac{1}{3}u + \frac{2}{3} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{7}{12}u^5 + \frac{13}{12}u^4 + \cdots + \frac{5}{6}u + \frac{2}{3} \\ \frac{1}{3}u^5 + \frac{7}{3}u^4 + \cdots + \frac{4}{3}u + \frac{11}{3} \end{pmatrix}$$

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

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{11}	$u^6 + 2u^5 + 11u^4 + 8u^3 + 35u^2 + 6u + 1$
c_2, c_3, c_5 c_6, c_7, c_8 c_{12}	$u^6 + u^4 + 2u^3 + 5u^2 - 2u + 1$
c_4, c_9	$u^6 - 3u^5 + 7u^4 - 9u^3 + 8u^2 - 4u + 4$
c_{10}	$u^6 - 5u^5 + 11u^4 - 15u^3 + 48u^2 - 48u + 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{11}	$y^6 + 18y^5 + 159y^4 + 684y^3 + 1151y^2 + 34y + 1$
c_2, c_3, c_5 c_6, c_7, c_8 c_{12}	$y^6 + 2y^5 + 11y^4 + 8y^3 + 35y^2 + 6y + 1$
c_4, c_9	$y^6 + 5y^5 + 11y^4 + 15y^3 + 48y^2 + 48y + 16$
c_{10}	$y^6 - 3y^5 + 67y^4 + 383y^3 + 1216y^2 - 768y + 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.161386 + 0.788818I$ $a = 0.386240 + 0.341797I$ $b = -0.360068 + 0.335344I$ $c = 0.318404 + 0.521609I$ $d = -0.207282 + 0.359834I$	$0.555934 - 1.031130I$	$7.70744 + 6.55849I$
$u = 0.161386 - 0.788818I$ $a = 0.386240 - 0.341797I$ $b = -0.360068 - 0.335344I$ $c = 0.318404 - 0.521609I$ $d = -0.207282 - 0.359834I$	$0.555934 + 1.031130I$	$7.70744 - 6.55849I$
$u = -1.161390 + 0.788818I$ $a = -0.263365 - 0.996502I$ $b = 0.040620 - 1.297830I$ $c = -0.543326 + 0.748451I$ $d = 1.09193 + 0.94958I$	$3.25859 + 6.90945I$	$3.50627 - 5.32738I$
$u = -1.161390 - 0.788818I$ $a = -0.263365 + 0.996502I$ $b = 0.040620 + 1.297830I$ $c = -0.543326 - 0.748451I$ $d = 1.09193 - 0.94958I$	$3.25859 - 6.90945I$	$3.50627 + 5.32738I$
$u = -0.50000 + 1.69717I$ $a = -0.622875 + 0.704751I$ $b = -0.18055 + 2.20615I$ $c = 1.224920 - 0.254488I$ $d = -0.88465 - 1.40950I$	$10.9899 + 13.3339I$	$2.78630 - 6.00559I$
$u = -0.50000 - 1.69717I$ $a = -0.622875 - 0.704751I$ $b = -0.18055 - 2.20615I$ $c = 1.224920 + 0.254488I$ $d = -0.88465 + 1.40950I$	$10.9899 - 13.3339I$	$2.78630 + 6.00559I$

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3 - 14u - 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^4 - u^3 + 16u + 16$
c_2, c_6	$u^4 - 3u^3 + 4u^2 - 4u + 4$
c_3, c_5, c_7 c_8, c_{12}	$u^4 + 3u^3 + 5u^2 + 3u + 2$
c_4, c_9	$u^4 + 4u^2 - 2u + 1$
c_{10}	$u^4 - 8u^3 + 18u^2 - 4u + 1$
c_{11}	$u^4 + u^3 + 11u^2 + 11u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^4 - y^3 + 64y^2 - 256y + 256$
c_2, c_6	$y^4 - y^3 + 16y + 16$
c_3, c_5, c_7 c_8, c_{12}	$y^4 + y^3 + 11y^2 + 11y + 4$
c_4, c_9	$y^4 + 8y^3 + 18y^2 + 4y + 1$
c_{10}	$y^4 - 28y^3 + 262y^2 + 20y + 1$
c_{11}	$y^4 + 21y^3 + 107y^2 - 33y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.264316+0.422125I$ $a=\ \ 1.04521-1.17351I$ $b=\ \ 0.264316-0.422125I$ $c=-1.00000$ $d=\ \ 0.219104+0.751390I$	$-3.71660+1.17563I$	$-0.79089-5.96277I$
$u=-0.264316-0.422125I$ $a=\ \ 1.04521+1.17351I$ $b=\ \ 0.264316+0.422125I$ $c=-1.00000$ $d=\ \ 0.219104-0.751390I$	$-3.71660-1.17563I$	$-0.79089+5.96277I$
$u=\ \ 0.26432+1.99036I$ $a=-0.545213-0.715953I$ $b=-0.26432-1.99036I$ $c=-1.00000$ $d=\ \ 1.28090-1.27441I$	$13.5862-4.7517I$	$4.79089+2.00586I$
$u=\ \ 0.26432-1.99036I$ $a=-0.545213+0.715953I$ $b=-0.26432+1.99036I$ $c=-1.00000$ $d=\ \ 1.28090+1.27441I$	$13.5862+4.7517I$	$4.79089-2.00586I$

III. $I_3^u = \langle -u^3+u^2+2d-3u-1,\ c+1,\ -u^3-u^2+2b-5u-5,\ -u^3+u^2+2a-5u+3,\ u^4+4u^2+2u+1\rangle$

(i) Arc colorings

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

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

$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{5}{2}u - \frac{3}{2} \\ \frac{1}{2}u^3 + \frac{1}{2}u^2 + \frac{5}{2}u + \frac{5}{2} \end{pmatrix}$$

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

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

$$a_6 = \begin{pmatrix} \frac{3}{2}u^3 - \frac{1}{2}u^2 + \frac{11}{2}u + \frac{5}{2} \\ -\frac{3}{2}u^3 + \frac{3}{2}u^2 - \frac{9}{2}u + \frac{1}{2} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} u^3 - u^2 + 3u - 2 \\ 3u + 3 \end{pmatrix}$$

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

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3 - 14u - 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^4 + u^3 + 11u^2 + 11u + 4$
c_2, c_3, c_6 c_7, c_8	$u^4 + 3u^3 + 5u^2 + 3u + 2$
c_4, c_9	$u^4 + 4u^2 - 2u + 1$
c_5, c_{12}	$u^4 - 3u^3 + 4u^2 - 4u + 4$
c_{10}	$u^4 - 8u^3 + 18u^2 - 4u + 1$
c_{11}	$u^4 - u^3 + 16u + 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^4 + 21y^3 + 107y^2 - 33y + 16$
c_2, c_3, c_6 c_7, c_8	$y^4 + y^3 + 11y^2 + 11y + 4$
c_4, c_9	$y^4 + 8y^3 + 18y^2 + 4y + 1$
c_5, c_{12}	$y^4 - y^3 + 16y + 16$
c_{10}	$y^4 - 28y^3 + 262y^2 + 20y + 1$
c_{11}	$y^4 - y^3 + 64y^2 - 256y + 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.264316 + 0.422125I$ $a = -2.04521 + 1.17351I$ $b = 1.84646 + 0.95037I$ $c = -1.00000$ $d = 0.219104 + 0.751390I$	$-3.71660 + 1.17563I$	$-0.79089 - 5.96277I$
$u = -0.264316 - 0.422125I$ $a = -2.04521 - 1.17351I$ $b = 1.84646 - 0.95037I$ $c = -1.00000$ $d = 0.219104 - 0.751390I$	$-3.71660 - 1.17563I$	$-0.79089 + 5.96277I$
$u = 0.26432 + 1.99036I$ $a = -0.454787 + 0.715953I$ $b = -0.34646 + 1.76812I$ $c = -1.00000$ $d = 1.28090 - 1.27441I$	$13.5862 - 4.7517I$	$4.79089 + 2.00586I$
$u = 0.26432 - 1.99036I$ $a = -0.454787 - 0.715953I$ $b = -0.34646 - 1.76812I$ $c = -1.00000$ $d = 1.28090 + 1.27441I$	$13.5862 + 4.7517I$	$4.79089 - 2.00586I$

IV. $I^u_4 = \langle u^3 - u^2 + 2d + 5u + 1,\ 5u^3 - u^2 + 2c + 19u + 5,\ b + u,\ u^3 - u^2 + 2a + 5u - 1,\ u^4 + 4u^2 + 2u + 1\rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -\frac{5}{2}u^3 + \frac{1}{2}u^2 - \frac{19}{2}u - \frac{5}{2} \\ -\frac{1}{2}u^3 + \frac{1}{2}u^2 - \frac{5}{2}u - \frac{1}{2} \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{2}u^3 + \frac{1}{2}u^2 - \frac{5}{2}u + \frac{1}{2} \\ -u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^2 - 4 \\ -\frac{1}{2}u^3 - \frac{1}{2}u^2 - \frac{1}{2}u - \frac{3}{2} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{1}{2}u^3 + \frac{1}{2}u^2 - \frac{5}{2}u + \frac{1}{2} \\ -\frac{1}{2}u^3 - \frac{1}{2}u^2 - \frac{3}{2}u - \frac{1}{2} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} \frac{1}{2}u^3 + \frac{1}{2}u^2 + \frac{3}{2}u + \frac{3}{2} \\ -u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -2u^3 + u^2 - 7u - 2 \\ -u^2 - 3u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -\frac{1}{2}u^3 + \frac{3}{2}u^2 - \frac{1}{2}u + \frac{7}{2} \\ \frac{3}{2}u^3 - \frac{1}{2}u^2 - \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3 - 14u - 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{11}	$u^4 + u^3 + 11u^2 + 11u + 4$
c_2, c_5, c_6 c_{12}	$u^4 + 3u^3 + 5u^2 + 3u + 2$
c_3, c_7, c_8	$u^4 - 3u^3 + 4u^2 - 4u + 4$
c_4, c_9	$u^4 + 4u^2 - 2u + 1$
c_{10}	$u^4 - 8u^3 + 18u^2 - 4u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{11}	$y^4 + 21y^3 + 107y^2 - 33y + 16$
c_2, c_5, c_6 c_{12}	$y^4 + y^3 + 11y^2 + 11y + 4$
c_3, c_7, c_8	$y^4 - y^3 + 16y + 16$
c_4, c_9	$y^4 + 8y^3 + 18y^2 + 4y + 1$
c_{10}	$y^4 - 28y^3 + 262y^2 + 20y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.264316 + 0.422125I$ $a = \quad 1.04521 - 1.17351I$ $b = \quad 0.264316 - 0.422125I$ $c = -0.35023 - 4.15490I$ $d = \quad 0.045213 - 1.173520I$	$-3.71660 + 1.17563I$	$-0.79089 - 5.96277I$
$u = -0.264316 - 0.422125I$ $a = \quad 1.04521 + 1.17351I$ $b = \quad 0.264316 + 0.422125I$ $c = -0.35023 + 4.15490I$ $d = \quad 0.045213 + 1.173520I$	$-3.71660 - 1.17563I$	$-0.79089 + 5.96277I$
$u = \quad 0.26432 + 1.99036I$ $a = -0.545213 - 0.715953I$ $b = -0.26432 - 1.99036I$ $c = \quad 0.850232 + 0.286979I$ $d = -1.54521 - 0.71595I$	$13.5862 - 4.7517I$	$4.79089 + 2.00586I$
$u = \quad 0.26432 - 1.99036I$ $a = -0.545213 + 0.715953I$ $b = -0.26432 + 1.99036I$ $c = \quad 0.850232 - 0.286979I$ $d = -1.54521 + 0.71595I$	$13.5862 + 4.7517I$	$4.79089 - 2.00586I$

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.50000 + 1.32288I$ $a = 1.00000$ $b = 0$ $c = 0.750000 + 0.661438I$ $d = -1.00000$	1.64493	6.00000
$u = 0.50000 - 1.32288I$ $a = 1.00000$ $b = 0$ $c = 0.750000 - 0.661438I$ $d = -1.00000$	1.64493	6.00000

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.50000 + 1.32288I$ $a = -0.250000 + 0.661438I$ $b = -0.50000 + 1.32288I$ $c = \quad 0.750000 + 0.661438I$ $d = -1.00000$	1.64493	6.00000
$u = \quad 0.50000 - 1.32288I$ $a = -0.250000 - 0.661438I$ $b = -0.50000 - 1.32288I$ $c = \quad 0.750000 - 0.661438I$ $d = -1.00000$	1.64493	6.00000

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

(i) Arc colorings

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

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

$$a_{10} = \begin{pmatrix} 1 \\ u-2 \end{pmatrix}$$

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

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

$$a_1 = \begin{pmatrix} \frac{1}{2}u - \frac{1}{2} \\ u-1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u-2 \end{pmatrix}$$

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

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

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

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

$$a_{11} = \begin{pmatrix} u-1 \\ u-2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_7^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.50000 + 1.32288I$ $a = -0.250000 + 0.661438I$ $b = -0.50000 + 1.32288I$ $c = 0$ $d = 0.50000 + 1.32288I$	1.64493	6.00000
$u = 0.50000 - 1.32288I$ $a = -0.250000 - 0.661438I$ $b = -0.50000 - 1.32288I$ $c = 0$ $d = 0.50000 - 1.32288I$	1.64493	6.00000

VIII. $I_8^u = \langle d+1,\ c,\ b,\ a-1,\ u+1 \rangle$

(i) Arc colorings

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

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

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

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

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

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

$$a_8 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

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

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

$$a_7 = \begin{pmatrix} -2 \\ -3 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_8^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = 1.00000$ $b = 0$ $c = 0$ $d = -1.00000$	1.64493	6.00000

IX. $I_9^u = \langle d,\ c-u,\ b-u,\ a-1,\ u^2+1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_9^u		$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u =$	$1.000000I$		
$a =$	1.00000		
$b =$	$1.000000I$	-1.64493	4.00000
$c =$	$1.000000I$		
$d =$	0		
$u =$	$-1.000000I$		
$a =$	1.00000		
$b =$	$-1.000000I$	-1.64493	4.00000
$c =$	$-1.000000I$		
$d =$	0		

X. $I^u_{10} = \langle d - u,\ c - 1,\ b + 1,\ a,\ u^2 + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_{10}^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = 0$ $b = -1.00000$ $c = 1.00000$ $d = 1.000000I$	-1.64493	4.00000
$u = -1.000000I$ $a = 0$ $b = -1.00000$ $c = 1.00000$ $d = -1.000000I$	-1.64493	4.00000

XI. $I_{11}^u = \langle d - u,\ c - 1,\ b - u,\ a - 1,\ u^2 + 1 \rangle$

(i) Arc colorings

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

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

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

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

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

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

$$a_8 = \begin{pmatrix} u + 1 \\ -1 \end{pmatrix}$$

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

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_{11}		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$1.000000I$		
$a =$	1.00000		
$b =$	$1.000000I$	-1.64493	4.00000
$c =$	1.00000		
$d =$	$1.000000I$		
$u =$	$-1.000000I$		
$a =$	1.00000		
$b =$	$-1.000000I$	-1.64493	4.00000
$c =$	1.00000		
$d =$	$-1.000000I$		

XII. $I^u_{12} = \langle d - u,\ cb - u + 1,\ a - 1,\ u^2 + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2$

(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_{12}^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$ $c = \cdots$ $d = \cdots$	-3.28987	-2.00000

XIII. $I_1^v = \langle a,\ d - v,\ -av + c + 1,\ b - 1,\ v^2 + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 1.000000I$ $a = 0$ $b = 1.00000$ $c = -1.00000$ $d = 1.000000I$	-4.93480	-8.00000
$v = -1.000000I$ $a = 0$ $b = 1.00000$ $c = -1.00000$ $d = -1.000000I$	-4.93480	-8.00000

XIV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_{11}	$u^2(u-1)^{11}(u^2+3u+4)(u^4-u^3+16u+16)$ $\cdot((u^4+u^3+11u^2+11u+4)^2)(u^6+2u^5+\cdots+6u+1)$
c_2, c_3, c_5 c_6, c_7, c_8 c_{12}	$u^2(u-1)^5(u^2+1)^3(u^2+u+2)(u^4-3u^3+4u^2-4u+4)$ $\cdot(u^4+3u^3+5u^2+3u+2)^2(u^6+u^4+2u^3+5u^2-2u+1)$
c_4, c_9	$u^2(u-1)(u^2+1)^3(u^2+u+2)^3(u^4+4u^2-2u+1)^3$ $\cdot(u^6-3u^5+7u^4-9u^3+8u^2-4u+4)$
c_{10}	$u^2(u-1)^6(u+1)(u^2-3u+4)^3(u^4-8u^3+18u^2-4u+1)^3$ $\cdot(u^6-5u^5+11u^4-15u^3+48u^2-48u+16)$

XV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_{11}	$y^2(y-1)^{11}(y^2-y+16)(y^4-y^3+64y^2-256y+256)$ $\cdot(y^4+21y^3+107y^2-33y+16)^2$ $\cdot(y^6+18y^5+159y^4+684y^3+1151y^2+34y+1)$
c_2, c_3, c_5 c_6, c_7, c_8 c_{12}	$y^2(y-1)^5(y+1)^6(y^2+3y+4)(y^4-y^3+16y+16)$ $\cdot((y^4+y^3+11y^2+11y+4)^2)(y^6+2y^5+\cdots+6y+1)$
c_4, c_9	$y^2(y-1)(y+1)^6(y^2+3y+4)^3(y^4+8y^3+18y^2+4y+1)^3$ $\cdot(y^6+5y^5+11y^4+15y^3+48y^2+48y+16)$
c_{10}	$y^2(y-1)^7(y^2-y+16)^3(y^4-28y^3+262y^2+20y+1)^3$ $\cdot(y^6-3y^5+67y^4+383y^3+1216y^2-768y+256)$