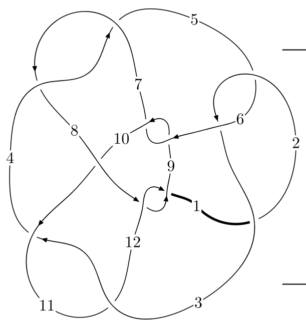
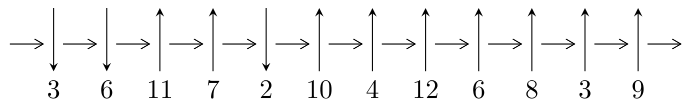
$12n_{0543}$ $(K12n_{0543})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -7700u^{17} + 5343u^{16} + \cdots + 94946b - 375396,\\
&\quad -208501u^{17} - 1574159u^{16} + \cdots + 189892a - 47374,\ u^{18} + 9u^{17} + \cdots - 32u - 8 \rangle\\
I_2^u &= \langle 2u^{15} - 8u^{14} + \cdots + 4b - 3,\ -3u^{15}a - u^{15} + \cdots + 4a - 5,\\
&\quad u^{16} - 5u^{15} + 13u^{14} - 20u^{13} + 20u^{12} - 13u^{11} + 7u^{10} - 4u^9 + 5u^8 - 6u^7 + 7u^6 + u^5 + u^3 + 2u^2 - 2u + 1 \rangle\\
I_3^u &= \langle u^5 - u^4 + 4u^2 + b - 3u + 1,\ u^6 + 4u^3 + u^2 + a + u,\ u^7 - 2u^6 + 2u^5 + 3u^4 - 7u^3 + 7u^2 - 4u + 1 \rangle\\
I_4^u &= \langle u^2 + b - 1,\ -u^2 + a + u,\ u^4 - u^2 + 1 \rangle\\
I_5^u &= \langle u^2 + b - 2u,\ -u^3 + 3u^2 + a - 2u - 1,\ u^4 - 4u^3 + 5u^2 - 2u + 1 \rangle\\
I_6^u &= \langle -u^3 + b + 1,\ u^2 + a,\ u^4 - u^2 + 1 \rangle
\end{aligned}$$

* 6 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 69 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. $\boldsymbol{I_1^u = \langle -7700u^{17} + 5343u^{16} + \cdots + 94946b - 375396,\ -2.09\times 10^5 u^{17} - 1.57\times 10^6 u^{16} + \cdots + 1.90\times 10^5 a - 4.74\times 10^4,\ u^{18} + 9u^{17} + \cdots - 32u - 8\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1.09800u^{17} + 8.28976u^{16} + \cdots - 15.7165u + 0.249479 \\ 0.0810987u^{17} - 0.0562741u^{16} + \cdots + 6.78168u + 3.95378 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -0.494223u^{17} - 4.52911u^{16} + \cdots + 19.6689u + 9.03346 \\ 0.806058u^{17} + 7.39600u^{16} + \cdots - 28.8365u - 8.13519 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -1.22543u^{17} - 10.2441u^{16} + \cdots + 36.7104u + 11.2034 \\ -0.156958u^{17} - 1.34093u^{16} + \cdots + 11.8068u + 6.16152 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1.55492u^{17} + 13.6648u^{16} + \cdots - 63.8250u - 22.6427 \\ 0.784725u^{17} + 6.89000u^{16} + \cdots - 28.0103u - 9.80343 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.770190u^{17} + 6.77476u^{16} + \cdots - 35.8147u - 12.8393 \\ 0.784725u^{17} + 6.89000u^{16} + \cdots - 28.0103u - 9.80343 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 0.290215u^{17} + 2.16110u^{16} + \cdots + 2.43279u + 1.45741 \\ -0.157274u^{17} - 1.91408u^{16} + \cdots + 16.4252u + 6.18248 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 2.34412u^{17} + 18.5078u^{16} + \cdots - 50.0957u - 13.4097 \\ -1.64756u^{17} - 13.1645u^{16} + \cdots + 21.7849u + 2.78798 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 2.10179u^{17} + 17.6337u^{16} + \cdots - 59.4695u - 17.2935 \\ -0.157274u^{17} - 1.91408u^{16} + \cdots + 16.4252u + 6.18248 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.321980u^{17} + 2.64919u^{16} + \cdots - 15.1353u - 5.98303 \\ -0.248631u^{17} - 1.59965u^{16} + \cdots + 4.32034u + 2.57584 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{296580}{47473}u^{17} - \frac{2538267}{47473}u^{16} + \cdots + \frac{10665772}{47473}u + \frac{3817158}{47473}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{18} + 13u^{17} + \cdots + 12928u + 256$
c_2, c_5	$u^{18} + 11u^{17} + \cdots - 32u + 16$
c_3, c_4, c_7 c_{11}	$u^{18} + u^{17} + \cdots - 6u + 1$
c_6, c_8, c_9 c_{12}	$u^{18} + u^{17} + \cdots - 3u - 1$
c_{10}	$u^{18} + 9u^{17} + \cdots - 32u - 8$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{18} - 25y^{17} + \cdots - 151904256y + 65536$
c_2, c_5	$y^{18} - 13y^{17} + \cdots - 12928y + 256$
c_3, c_4, c_7 c_{11}	$y^{18} + 17y^{17} + \cdots - 14y + 1$
c_6, c_8, c_9 c_{12}	$y^{18} + 3y^{17} + \cdots - y + 1$
c_{10}	$y^{18} - 5y^{17} + \cdots - 416y + 64$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.620829+0.451049I$ $a=-1.057030-0.908608I$ $b=-0.364836-0.513954I$	$-4.27022-1.76048I$	$4.57169+3.79716I$
$u=-0.620829-0.451049I$ $a=-1.057030+0.908608I$ $b=-0.364836+0.513954I$	$-4.27022+1.76048I$	$4.57169-3.79716I$
$u=\ \ 0.299337+0.584940I$ $a=-1.029310-0.829653I$ $b=-0.727675+1.001360I$	$-1.45016+2.06579I$	$-1.19192-3.00311I$
$u=\ \ 0.299337-0.584940I$ $a=-1.029310+0.829653I$ $b=-0.727675-1.001360I$	$-1.45016-2.06579I$	$-1.19192+3.00311I$
$u=-0.550550+0.319324I$ $a=\ \ 1.76918-0.57363I$ $b=\ \ 0.636691-0.143319I$	$0.60964-2.63332I$	$1.40533+10.85901I$
$u=-0.550550-0.319324I$ $a=\ \ 1.76918+0.57363I$ $b=\ \ 0.636691+0.143319I$	$0.60964+2.63332I$	$1.40533-10.85901I$
$u=\ \ 1.39562+0.46679I$ $a=\ \ 0.039259+0.359476I$ $b=\ \ 0.513460-1.193020I$	$1.25038+1.91482I$	$14.6915-3.0336I$
$u=\ \ 1.39562-0.46679I$ $a=\ \ 0.039259-0.359476I$ $b=\ \ 0.513460+1.193020I$	$1.25038-1.91482I$	$14.6915+3.0336I$
$u=-1.50565$ $a=\ \ 0.258519$ $b=-0.196820$	7.31535	30.1030
$u=\ \ 0.460925$ $a=-0.513715$ $b=\ \ 0.345924$	0.812221	12.1610

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.99486 + 1.19077I$ $a = -0.774071 + 0.517855I$ $b = -1.71185 - 0.17534I$	$-7.59215 - 0.44788I$	$1.54300 - 0.72825I$
$u = -0.99486 - 1.19077I$ $a = -0.774071 - 0.517855I$ $b = -1.71185 + 0.17534I$	$-7.59215 + 0.44788I$	$1.54300 + 0.72825I$
$u = -1.13905 + 1.08250I$ $a = 0.869148 - 0.562899I$ $b = 1.65960 + 0.63204I$	$-7.10236 - 7.75507I$	$1.99474 + 5.37139I$
$u = -1.13905 - 1.08250I$ $a = 0.869148 + 0.562899I$ $b = 1.65960 - 0.63204I$	$-7.10236 + 7.75507I$	$1.99474 - 5.37139I$
$u = -1.13411 + 1.20889I$ $a = -0.943992 + 0.426963I$ $b = -1.89059 - 0.88824I$	$-14.6094 - 14.6374I$	$2.41427 + 6.49796I$
$u = -1.13411 - 1.20889I$ $a = -0.943992 - 0.426963I$ $b = -1.89059 + 0.88824I$	$-14.6094 + 14.6374I$	$2.41427 - 6.49796I$
$u = -1.23320 + 1.28187I$ $a = 0.504423 - 0.599474I$ $b = 1.81064 + 0.13552I$	$-14.4902 + 5.6411I$	$1.43945 - 2.69512I$
$u = -1.23320 - 1.28187I$ $a = 0.504423 + 0.599474I$ $b = 1.81064 - 0.13552I$	$-14.4902 - 5.6411I$	$1.43945 + 2.69512I$

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle 2u^{15} - 8u^{14} + \cdots + 4b - 3,\ -3u^{15}a - u^{15} + \cdots + 4a - 5,\ u^{16} - 5u^{15} + \cdots - 2u + 1\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a \\ -\frac{1}{2}u^{15} + 2u^{14} + \cdots - \frac{1}{2}u + \frac{3}{4} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{1}{2}u^{15} - 2u^{14} + \cdots + a - \frac{3}{4} \\ -\frac{1}{2}u^{15} + \frac{9}{4}u^{14} + \cdots - u + \frac{5}{4} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{1}{2}u^{15}a - \frac{7}{4}u^{15} + \cdots + \frac{1}{2}a + 2 \\ \frac{1}{4}u^{15}a + \frac{3}{4}u^{15} + \cdots - \frac{1}{2}a - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -\frac{1}{2}u^{15}a - u^{15} + \cdots + \frac{3}{4}a + \frac{1}{4} \\ -\frac{1}{4}u^{14}a - \frac{3}{4}u^{15} + \cdots - \frac{1}{2}a + \frac{1}{4} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{2}u^{15}a - \frac{1}{4}u^{15} + \cdots + \frac{5}{4}a - \frac{3}{2}u \\ -\frac{1}{4}u^{14}a - \frac{3}{4}u^{15} + \cdots - \frac{1}{2}a + \frac{1}{4} \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{15}a + u^{15} + \cdots + \frac{3}{4}a - 1 \\ \frac{1}{4}u^{14}a - \frac{3}{4}u^{15} + \cdots + \frac{1}{4}a + \frac{5}{4} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{2}u^{15}a + \frac{5}{4}u^{15} + \cdots + \frac{1}{2}a - \frac{3}{2} \\ \frac{1}{2}u^{14}a - u^{15} + \cdots + \frac{1}{2}a + \frac{3}{2} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -\frac{3}{4}u^{15}a - \frac{1}{2}u^{15} + \cdots + \frac{7}{4}a + \frac{3}{4} \\ -\frac{1}{4}u^{14}a - \frac{1}{4}u^{15} + \cdots - \frac{1}{4}a + \frac{1}{2} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -\frac{1}{4}u^{15}a - u^{15} + \cdots + a + \frac{1}{2} \\ -\frac{1}{4}u^{12}a - \frac{1}{4}u^{12} + \cdots - \frac{1}{4}a - \frac{1}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2u^{15} + 10u^{14} - 24u^{13} + 30u^{12} - 14u^{11} - 14u^{10} + 26u^9 - 18u^8 + 4u^7 + 4u^6 - 4u^5 - 14u^4 + 14u^3 - 6u + 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{16}+22u^{15}+\cdots-46u+1)^2$
c_2, c_5	$(u^{16}-4u^{15}+\cdots-2u+1)^2$
c_3, c_4, c_7 c_{11}	$u^{32}+3u^{31}+\cdots+310u+25$
c_6, c_8, c_9 c_{12}	$u^{32}-u^{31}+\cdots-160u+31$
c_{10}	$(u^{16}-5u^{15}+\cdots-2u+1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{16} - 50y^{15} + \cdots - 1390y + 1)^2$
c_2, c_5	$(y^{16} - 22y^{15} + \cdots + 46y + 1)^2$
c_3, c_4, c_7 c_{11}	$y^{32} + 33y^{31} + \cdots - 34950y + 625$
c_6, c_8, c_9 c_{12}	$y^{32} + y^{31} + \cdots + 7570y + 961$
c_{10}	$(y^{16} + y^{15} + \cdots + 8y^2 + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.078548+0.995560I$ $a=\ \ 1.54698-0.54298I$ $b=\ \ 1.44017-0.27086I$	$-9.80009+4.24253I$	$-0.116479-1.317997I$
$u=-0.078548+0.995560I$ $a=-0.035239-0.166444I$ $b=-0.42773-1.75221I$	$-9.80009+4.24253I$	$-0.116479-1.317997I$
$u=-0.078548-0.995560I$ $a=\ \ 1.54698+0.54298I$ $b=\ \ 1.44017+0.27086I$	$-9.80009-4.24253I$	$-0.116479+1.317997I$
$u=-0.078548-0.995560I$ $a=-0.035239+0.166444I$ $b=-0.42773+1.75221I$	$-9.80009-4.24253I$	$-0.116479+1.317997I$
$u=-0.618832+0.582672I$ $a=-1.45203+0.63357I$ $b=-2.01398-0.36399I$	$-7.78284-7.28600I$	$5.19770+8.47550I$
$u=-0.618832+0.582672I$ $a=-1.96094-0.69795I$ $b=\ \ 0.059119-0.145681I$	$-7.78284-7.28600I$	$5.19770+8.47550I$
$u=-0.618832-0.582672I$ $a=-1.45203-0.63357I$ $b=-2.01398+0.36399I$	$-7.78284+7.28600I$	$5.19770-8.47550I$
$u=-0.618832-0.582672I$ $a=-1.96094+0.69795I$ $b=\ \ 0.059119+0.145681I$	$-7.78284+7.28600I$	$5.19770-8.47550I$
$u=\ \ 0.200052+0.779501I$ $a=-0.253970-0.886241I$ $b=-0.295454+0.605750I$	$-1.79763+1.95154I$	$0.19509-4.92419I$
$u=\ \ 0.200052+0.779501I$ $a=-1.277830-0.167455I$ $b=-1.41755+0.67875I$	$-1.79763+1.95154I$	$0.19509-4.92419I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.200052 - 0.779501I$ $a = -0.253970 + 0.886241I$ $b = -0.295454 - 0.605750I$	$-1.79763 - 1.95154I$	$0.19509 + 4.92419I$
$u = 0.200052 - 0.779501I$ $a = -1.277830 + 0.167455I$ $b = -1.41755 - 0.67875I$	$-1.79763 - 1.95154I$	$0.19509 + 4.92419I$
$u = -0.707768 + 0.273164I$ $a = 0.773361 - 0.731696I$ $b = 0.540678 - 1.129560I$	$1.12133 - 2.90012I$	$15.0799 + 9.1644I$
$u = -0.707768 + 0.273164I$ $a = 1.54847 - 1.86155I$ $b = 0.407161 + 0.663234I$	$1.12133 - 2.90012I$	$15.0799 + 9.1644I$
$u = -0.707768 - 0.273164I$ $a = 0.773361 + 0.731696I$ $b = 0.540678 + 1.129560I$	$1.12133 + 2.90012I$	$15.0799 - 9.1644I$
$u = -0.707768 - 0.273164I$ $a = 1.54847 + 1.86155I$ $b = 0.407161 - 0.663234I$	$1.12133 + 2.90012I$	$15.0799 - 9.1644I$
$u = 0.450330 + 0.346781I$ $a = 0.81562 + 1.35279I$ $b = 1.246660 + 0.174676I$	$0.284266 + 0.252535I$	$7.69503 - 0.47605I$
$u = 0.450330 + 0.346781I$ $a = -1.82349 + 0.20268I$ $b = 0.315640 - 0.339236I$	$0.284266 + 0.252535I$	$7.69503 - 0.47605I$
$u = 0.450330 - 0.346781I$ $a = 0.81562 - 1.35279I$ $b = 1.246660 - 0.174676I$	$0.284266 - 0.252535I$	$7.69503 + 0.47605I$
$u = 0.450330 - 0.346781I$ $a = -1.82349 - 0.20268I$ $b = 0.315640 + 0.339236I$	$0.284266 - 0.252535I$	$7.69503 + 0.47605I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.33361 + 0.53567I$ $a = -0.290025 - 0.940647I$ $b = -0.793311 + 0.827022I$	$-2.00097 + 1.60825I$	$1.16219 - 1.27845I$
$u = 1.33361 + 0.53567I$ $a = 0.180629 + 0.670081I$ $b = 0.570864 + 0.152271I$	$-2.00097 + 1.60825I$	$1.16219 - 1.27845I$
$u = 1.33361 - 0.53567I$ $a = -0.290025 + 0.940647I$ $b = -0.793311 - 0.827022I$	$-2.00097 - 1.60825I$	$1.16219 + 1.27845I$
$u = 1.33361 - 0.53567I$ $a = 0.180629 - 0.670081I$ $b = 0.570864 - 0.152271I$	$-2.00097 - 1.60825I$	$1.16219 + 1.27845I$
$u = 1.06623 + 1.07345I$ $a = -0.678241 - 0.653893I$ $b = -1.89910 - 0.26915I$	$-14.8835 + 3.9428I$	$1.33663 - 2.55221I$
$u = 1.06623 + 1.07345I$ $a = 1.032010 + 0.660075I$ $b = 1.54815 - 0.92691I$	$-14.8835 + 3.9428I$	$1.33663 - 2.55221I$
$u = 1.06623 - 1.07345I$ $a = -0.678241 + 0.653893I$ $b = -1.89910 + 0.26915I$	$-14.8835 - 3.9428I$	$1.33663 + 2.55221I$
$u = 1.06623 - 1.07345I$ $a = 1.032010 - 0.660075I$ $b = 1.54815 + 0.92691I$	$-14.8835 - 3.9428I$	$1.33663 + 2.55221I$
$u = 0.85493 + 1.30642I$ $a = -0.924256 - 0.154538I$ $b = -1.64201 + 0.68143I$	$-4.61900 + 6.08853I$	$1.44994 - 2.95702I$
$u = 0.85493 + 1.30642I$ $a = 0.798966 + 0.220587I$ $b = 1.86069 - 0.22989I$	$-4.61900 + 6.08853I$	$1.44994 - 2.95702I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.85493 - 1.30642I$ $a = -0.924256 + 0.154538I$ $b = -1.64201 - 0.68143I$	$-4.61900 - 6.08853I$	$1.44994 + 2.95702I$
$u = 0.85493 - 1.30642I$ $a = 0.798966 - 0.220587I$ $b = 1.86069 + 0.22989I$	$-4.61900 - 6.08853I$	$1.44994 + 2.95702I$

III. $\boldsymbol{I_3^u = \langle u^5 - u^4 + 4u^2 + b - 3u + 1,\ u^6 + 4u^3 + u^2 + a + u,\ u^7 - 2u^6 + 2u^5 + 3u^4 - 7u^3 + 7u^2 - 4u + 1\rangle}$

(i) Arc colorings

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

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

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

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

$$a_3 = \begin{pmatrix} u^6 - 2u^5 + u^4 + 4u^3 - 7u^2 + 3u - 1 \\ -u^6 + u^5 - u^4 - 4u^3 + 3u^2 - 3u + 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -3u^6 + 5u^5 - 4u^4 - 11u^3 + 18u^2 - 14u + 5 \\ -2u^6 + 3u^5 - 3u^4 - 7u^3 + 10u^2 - 10u + 4 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -5u^6 + 8u^5 - 7u^4 - 18u^3 + 28u^2 - 25u + 9 \\ -u^6 + 2u^5 - 2u^4 - 3u^3 + 7u^2 - 7u + 3 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -4u^6 + 6u^5 - 5u^4 - 15u^3 + 21u^2 - 18u + 6 \\ -u^6 + 2u^5 - 2u^4 - 3u^3 + 7u^2 - 7u + 3 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} -4u^6 + 7u^5 - 5u^4 - 15u^3 + 25u^2 - 16u + 5 \\ -2u^6 + 4u^5 - 4u^4 - 7u^3 + 15u^2 - 14u + 5 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -7u^6 + 9u^5 - 6u^4 - 27u^3 + 30u^2 - 21u + 8 \\ -u^6 + u^5 - 4u^3 + 3u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -2u^6 + 2u^5 - u^4 - 8u^3 + 6u^2 - 3u + 1 \\ -2u^6 + 3u^5 - 2u^4 - 8u^3 + 11u^2 - 7u + 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 8u^6 - 6u^5 + 3u^4 + 33u^3 - 21u^2 + 14u + 1$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^7 - 6u^6 + 11u^5 - 9u^4 + 17u^3 - 21u^2 + 7u - 1$
c_2	$u^7 + 2u^6 - u^5 - u^4 + 3u^3 - u^2 - 3u - 1$
c_3, c_7	$u^7 - u^6 + 3u^5 - 2u^4 + 6u^3 - 5u^2 + 6u - 1$
c_4, c_{11}	$u^7 + u^6 + 3u^5 + 2u^4 + 6u^3 + 5u^2 + 6u + 1$
c_5	$u^7 - 2u^6 - u^5 + u^4 + 3u^3 + u^2 - 3u + 1$
c_6, c_8	$u^7 - 3u^6 + 4u^5 - 3u^4 + u - 1$
c_9, c_{12}	$u^7 + 3u^6 + 4u^5 + 3u^4 + u + 1$
c_{10}	$u^7 - 2u^6 + 2u^5 + 3u^4 - 7u^3 + 7u^2 - 4u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^7 - 14y^6 + 47y^5 + 55y^4 + 53y^3 - 221y^2 + 7y - 1$
c_2, c_5	$y^7 - 6y^6 + 11y^5 - 9y^4 + 17y^3 - 21y^2 + 7y - 1$
c_3, c_4, c_7 c_{11}	$y^7 + 5y^6 + 17y^5 + 34y^4 + 50y^3 + 43y^2 + 26y - 1$
c_6, c_8, c_9 c_{12}	$y^7 - y^6 - 2y^5 - 7y^4 + 2y^3 - 6y^2 + y - 1$
c_{10}	$y^7 + 2y^5 - 17y^4 - 5y^3 + y^2 + 2y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.275997 + 0.735389I$ $a = 1.76625 - 0.41875I$ $b = 1.44608 + 0.27177I$	$-8.98016 + 6.30105I$	$-0.02240 - 4.97171I$
$u = 0.275997 - 0.735389I$ $a = 1.76625 + 0.41875I$ $b = 1.44608 - 0.27177I$	$-8.98016 - 6.30105I$	$-0.02240 + 4.97171I$
$u = 0.596254 + 0.178118I$ $a = -1.53109 - 1.18504I$ $b = -0.457796 - 0.270377I$	$0.78802 + 2.21063I$	$7.70396 + 4.43025I$
$u = 0.596254 - 0.178118I$ $a = -1.53109 + 1.18504I$ $b = -0.457796 + 0.270377I$	$0.78802 - 2.21063I$	$7.70396 - 4.43025I$
$u = -1.55196$ $a = 0.122596$ $b = -0.485549$	7.12086	-11.4550
$u = 0.90373 + 1.37120I$ $a = -0.796458 - 0.161416I$ $b = -1.74551 + 0.56429I$	$-3.59296 + 6.79923I$	$8.04613 - 7.57361I$
$u = 0.90373 - 1.37120I$ $a = -0.796458 + 0.161416I$ $b = -1.74551 - 0.56429I$	$-3.59296 - 6.79923I$	$8.04613 + 7.57361I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^2 + 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = -0.366025 + 0.366025I$ $b = 0.500000 - 0.866025I$	$2.02988I$	$6.00000 - 3.46410I$
$u = 0.866025 - 0.500000I$ $a = -0.366025 - 0.366025I$ $b = 0.500000 + 0.866025I$	$-2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 + 0.500000I$ $a = 1.36603 - 1.36603I$ $b = 0.500000 + 0.866025I$	$-2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 - 0.500000I$ $a = 1.36603 + 1.36603I$ $b = 0.500000 - 0.866025I$	$2.02988I$	$6.00000 - 3.46410I$

V. $\boldsymbol{I_5^u = \langle u^2 + b - 2u,\ -u^3 + 3u^2 + a - 2u - 1,\ u^4 - 4u^3 + 5u^2 - 2u + 1\rangle}$

(i) Arc colorings

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

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

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

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

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

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

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

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

$$a_2 = \begin{pmatrix} u^3 - 4u^2 + 4u \\ u^3 - 2u^2 + u - 1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 0 \\ -u^3 + 2u^2 - u + 1 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^2 + 8u + 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=$	$0.133975+0.500000I$		
$a=$	$1.86603+0.50000I$	$-2.02988I$	$6.00000+3.46410I$
$b=$	$0.500000+0.866025I$		
$u=$	$0.133975-0.500000I$		
$a=$	$1.86603-0.50000I$	$2.02988I$	$6.00000-3.46410I$
$b=$	$0.500000-0.866025I$		
$u=$	$1.86603+0.50000I$		
$a=$	$0.133975+0.500000I$	$2.02988I$	$6.00000-3.46410I$
$b=$	$0.500000-0.866025I$		
$u=$	$1.86603-0.50000I$		
$a=$	$0.133975-0.500000I$	$-2.02988I$	$6.00000+3.46410I$
$b=$	$0.500000+0.866025I$		

VI. $I_6^u = \langle -u^3 + b + 1,\ u^2 + a,\ u^4 - u^2 + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^2 + 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = -0.500000 - 0.866025I$ $b = -1.00000 + 1.00000I$	$2.02988I$	$6.00000 - 3.46410I$
$u = 0.866025 - 0.500000I$ $a = -0.500000 + 0.866025I$ $b = -1.00000 - 1.00000I$	$-2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 + 0.500000I$ $a = -0.500000 + 0.866025I$ $b = -1.00000 + 1.00000I$	$-2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 - 0.500000I$ $a = -0.500000 - 0.866025I$ $b = -1.00000 - 1.00000I$	$2.02988I$	$6.00000 - 3.46410I$

VII. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)^6(u^7-6u^6+11u^5-9u^4+17u^3-21u^2+7u-1)$ $\cdot((u^{16}+22u^{15}+\cdots-46u+1)^2)(u^{18}+13u^{17}+\cdots+12928u+256)$
c_2	$(u^4-u^2+1)^3(u^7+2u^6-u^5-u^4+3u^3-u^2-3u-1)$ $\cdot((u^{16}-4u^{15}+\cdots-2u+1)^2)(u^{18}+11u^{17}+\cdots-32u+16)$
c_3, c_7	$(u^2+1)^4(u^4-2u^3+5u^2-4u+1)$ $\cdot(u^7-u^6+\cdots+6u-1)(u^{18}+u^{17}+\cdots-6u+1)$ $\cdot(u^{32}+3u^{31}+\cdots+310u+25)$
c_4, c_{11}	$(u^2+1)^4(u^4+2u^3+5u^2+4u+1)$ $\cdot(u^7+u^6+\cdots+6u+1)(u^{18}+u^{17}+\cdots-6u+1)$ $\cdot(u^{32}+3u^{31}+\cdots+310u+25)$
c_5	$(u^4-u^2+1)^3(u^7-2u^6-u^5+u^4+3u^3+u^2-3u+1)$ $\cdot((u^{16}-4u^{15}+\cdots-2u+1)^2)(u^{18}+11u^{17}+\cdots-32u+16)$
c_6, c_8	$(u+1)^8(u^4-4u^3+5u^2-2u+1)(u^7-3u^6+4u^5-3u^4+u-1)$ $\cdot(u^{18}+u^{17}+\cdots-3u-1)(u^{32}-u^{31}+\cdots-160u+31)$
c_9, c_{12}	$(u-1)^8(u^4+4u^3+5u^2+2u+1)(u^7+3u^6+4u^5+3u^4+u+1)$ $\cdot(u^{18}+u^{17}+\cdots-3u-1)(u^{32}-u^{31}+\cdots-160u+31)$
c_{10}	$(u^4-u^2+1)^2(u^4-4u^3+5u^2-2u+1)$ $\cdot(u^7-2u^6+2u^5+3u^4-7u^3+7u^2-4u+1)$ $\cdot((u^{16}-5u^{15}+\cdots-2u+1)^2)(u^{18}+9u^{17}+\cdots-32u-8)$

VIII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^2+y+1)^6(y^7-14y^6+47y^5+55y^4+53y^3-221y^2+7y-1)$ $\cdot(y^{16}-50y^{15}+\cdots-1390y+1)^2$ $\cdot(y^{18}-25y^{17}+\cdots-151904256y+65536)$
c_2, c_5	$(y^2-y+1)^6(y^7-6y^6+11y^5-9y^4+17y^3-21y^2+7y-1)$ $\cdot((y^{16}-22y^{15}+\cdots+46y+1)^2)(y^{18}-13y^{17}+\cdots-12928y+256)$
c_3, c_4, c_7 c_{11}	$(y+1)^8(y^4+6y^3+11y^2-6y+1)$ $\cdot(y^7+5y^6+17y^5+34y^4+50y^3+43y^2+26y-1)$ $\cdot(y^{18}+17y^{17}+\cdots-14y+1)(y^{32}+33y^{31}+\cdots-34950y+625)$
c_6, c_8, c_9 c_{12}	$(y-1)^8(y^4-6y^3+11y^2+6y+1)$ $\cdot(y^7-y^6+\cdots+y-1)(y^{18}+3y^{17}+\cdots-y+1)$ $\cdot(y^{32}+y^{31}+\cdots+7570y+961)$
c_{10}	$(y^2-y+1)^4(y^4-6y^3+11y^2+6y+1)$ $\cdot(y^7+2y^5+\cdots+2y-1)(y^{16}+y^{15}+\cdots+8y^2+1)^2$ $\cdot(y^{18}-5y^{17}+\cdots-416y+64)$