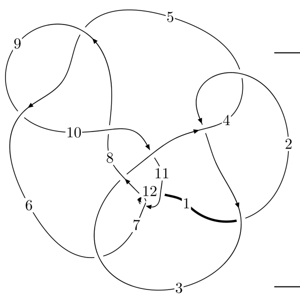
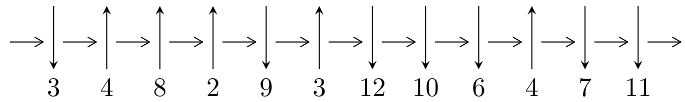
$12n_{0147}$ ($K12n_{0147}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u &= \langle -3u^{15} - 5u^{14} + \cdots + 4b - 5,\ -3u^{15} - 3u^{14} + \cdots + 2a - 4,\\
&\quad u^{16} + u^{15} - 5u^{14} - 5u^{13} + 11u^{12} + 12u^{11} - 8u^{10} - 13u^9 - 8u^8 + 2u^7 + 18u^6 + 11u^5 - 7u^4 - 9u^3 - u^2 + 2u -\\
I_2^u &= \langle 1404675088u^{27} + 680434033u^{26} + \cdots + 5440114508b + 183536430,\\
&\quad 4259487893u^{27} + 5117778300u^{26} + \cdots + 10880229016a - 10842072870,\\
&\quad u^{28} + 2u^{27} + \cdots + 12u + 4\rangle\\
I_3^u &= \langle u^3 + b + u + 1,\ -u^2 + a + 2u + 1,\ u^4 - u^2 + 1\rangle\\
I_4^u &= \langle -u^3 + b - u + 1,\ -u^2 + a - u + 1,\ u^4 - u^2 + 1\rangle\\
I_5^u &= \langle -u^3 + u^2 + b - u - 1,\ u^2 + a - u,\ u^4 - u^2 + 1\rangle\\
I_6^u &= \langle u^3 - u^2 + b + u,\ a + 2u - 1,\ u^4 - u^2 + 1\rangle\\
I_7^u &= \langle -u^3 + b - u,\ a - u,\ u^4 + u^3 + 1\rangle\\
I_8^u &= \langle a^3 + 2a^2 + b + 3a + 1,\ a^4 + 3a^3 + 6a^2 + 4a + 1,\ u - 1\rangle\\
I_9^u &= \langle b - 2,\ a - 1,\ u - 1\rangle
\end{aligned}
$$

* 9 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. $I_1^u =$ $\langle -3u^{15}-5u^{14}+\cdots+4b-5,\ -3u^{15}-3u^{14}+\cdots+2a-4,\ u^{16}+u^{15}+\cdots+2u+1\rangle$

(i) Arc colorings

$$a_7 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}\frac{3}{2}u^{15}+\frac{3}{2}u^{14}+\cdots+\frac{5}{2}u+2\\ \frac{3}{4}u^{15}+\frac{5}{4}u^{14}+\cdots+\frac{1}{2}u+\frac{5}{4}\end{pmatrix}$$
$$a_8 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}\frac{1}{4}u^{15}+\frac{3}{4}u^{14}+\cdots+\frac{1}{2}u+\frac{3}{4}\\ \frac{1}{2}u^{15}+\frac{3}{4}u^{14}+\cdots+\frac{3}{4}u+\frac{3}{4}\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-\frac{11}{4}u^{15}-u^{14}+\cdots-\frac{17}{4}u-\frac{7}{2}\\ -u^{15}-\frac{1}{2}u^{14}+\cdots-\frac{1}{2}u-\frac{3}{2}\end{pmatrix}$$
$$a_5 = \begin{pmatrix}\frac{5}{2}u^{15}+u^{14}+\cdots+\frac{9}{2}u+2\\ u^{15}+\frac{1}{2}u^{14}+\cdots+\frac{3}{2}u+\frac{3}{2}\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-2u^{15}-\frac{3}{4}u^{14}+\cdots-\frac{13}{4}u-\frac{5}{4}\\ -\frac{3}{4}u^{15}-\frac{1}{4}u^{14}+\cdots-\frac{3}{2}u-\frac{5}{4}\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-2u^{15}-\frac{3}{4}u^{14}+\cdots-\frac{13}{4}u-\frac{9}{4}\\ -\frac{3}{4}u^{15}-\frac{1}{4}u^{14}+\cdots-\frac{1}{2}u-\frac{5}{4}\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-\frac{3}{4}u^{15}-\frac{1}{4}u^{14}+\cdots-\frac{1}{2}u-\frac{1}{4}\\ -\frac{1}{4}u^{15}+\frac{3}{2}u^{13}+\cdots-\frac{1}{4}u-\frac{1}{2}\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6u^{15}-\frac{1}{2}u^{14}+32u^{13}+u^{12}-\frac{151}{2}u^{11}-4u^{10}+\frac{147}{2}u^9+\frac{29}{2}u^8+\frac{21}{2}u^7-30u^6-\frac{159}{2}u^5+\frac{41}{2}u^4+\frac{103}{2}u^3+\frac{5}{2}u^2-\frac{35}{2}u-\frac{13}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{16} + 16u^{15} + \cdots + 1760u + 256$
c_2, c_4	$u^{16} - 4u^{15} + \cdots - 56u + 16$
c_3	$u^{16} + 4u^{15} + \cdots + 12u + 4$
c_5, c_7, c_9 c_{11}	$u^{16} - u^{15} + \cdots - 2u + 1$
c_6, c_{10}	$u^{16} - u^{15} + \cdots + 64u + 16$
c_8, c_{12}	$u^{16} + 11u^{15} + \cdots + 6u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{16} - 24y^{15} + \cdots - 508416y + 65536$
c_2, c_4	$y^{16} + 16y^{15} + \cdots + 1760y + 256$
c_3	$y^{16} - 4y^{15} + \cdots - 56y + 16$
c_5, c_7, c_9 c_{11}	$y^{16} - 11y^{15} + \cdots - 6y + 1$
c_6, c_{10}	$y^{16} + 25y^{15} + \cdots + 256y + 256$
c_8, c_{12}	$y^{16} - 7y^{15} + \cdots + 10y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.053870 + 0.977866I$ $a = 1.287840 - 0.220850I$ $b = -0.321900 - 0.803375I$	$-5.56822 - 3.25567I$	$-1.25924 + 2.26983I$
$u = -0.053870 - 0.977866I$ $a = 1.287840 + 0.220850I$ $b = -0.321900 + 0.803375I$	$-5.56822 + 3.25567I$	$-1.25924 - 2.26983I$
$u = 1.201500 + 0.360870I$ $a = -1.62412 - 1.03706I$ $b = -2.42883 - 2.34865I$	$-3.59239 - 7.60004I$	$-5.70207 + 6.90528I$
$u = 1.201500 - 0.360870I$ $a = -1.62412 + 1.03706I$ $b = -2.42883 + 2.34865I$	$-3.59239 + 7.60004I$	$-5.70207 - 6.90528I$
$u = -0.670764 + 0.317932I$ $a = 2.23583 - 1.40717I$ $b = 1.14025 - 0.90622I$	$-0.26009 + 4.34202I$	$-3.06611 - 5.18312I$
$u = -0.670764 - 0.317932I$ $a = 2.23583 + 1.40717I$ $b = 1.14025 + 0.90622I$	$-0.26009 - 4.34202I$	$-3.06611 + 5.18312I$
$u = 0.703515 + 0.140913I$ $a = 0.003040 + 0.299544I$ $b = 0.501025 + 0.546651I$	$-1.337230 - 0.185301I$	$-7.62381 + 0.24647I$
$u = 0.703515 - 0.140913I$ $a = 0.003040 - 0.299544I$ $b = 0.501025 - 0.546651I$	$-1.337230 + 0.185301I$	$-7.62381 - 0.24647I$
$u = -1.280950 + 0.212067I$ $a = 0.273114 - 0.087546I$ $b = 0.130376 + 0.667731I$	$-6.90379 + 2.57028I$	$-9.79223 - 1.93561I$
$u = -1.280950 - 0.212067I$ $a = 0.273114 + 0.087546I$ $b = 0.130376 - 0.667731I$	$-6.90379 - 2.57028I$	$-9.79223 + 1.93561I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.29321 + 0.59629I$ $a = 1.59347 + 1.06533I$ $b = 1.53873 + 2.99555I$	$-12.8610 - 14.5081I$	$-5.76542 + 7.91129I$
$u = 1.29321 - 0.59629I$ $a = 1.59347 - 1.06533I$ $b = 1.53873 - 2.99555I$	$-12.8610 + 14.5081I$	$-5.76542 - 7.91129I$
$u = -0.358572 + 0.446053I$ $a = -2.09650 + 0.59301I$ $b = -0.541243 + 0.861918I$	$1.55250 - 0.72268I$	$4.27343 + 0.90071I$
$u = -0.358572 - 0.446053I$ $a = -2.09650 - 0.59301I$ $b = -0.541243 - 0.861918I$	$1.55250 + 0.72268I$	$4.27343 - 0.90071I$
$u = -1.33407 + 0.55318I$ $a = -0.172674 - 0.381772I$ $b = -0.018408 - 1.337270I$	$-13.7981 + 7.5953I$	$-7.06455 - 3.46610I$
$u = -1.33407 - 0.55318I$ $a = -0.172674 + 0.381772I$ $b = -0.018408 + 1.337270I$	$-13.7981 - 7.5953I$	$-7.06455 + 3.46610I$

II. $\boldsymbol{I_2^u = \langle 1.40\times10^9u^{27}+6.80\times10^8u^{26}+\cdots+5.44\times10^9b+1.84\times10^8,\ 4.26\times10^9u^{27}+5.12\times10^9u^{26}+\cdots+1.09\times10^{10}a-1.08\times10^{10},\ u^{28}+2u^{27}+\cdots+12u+4\rangle}$

(i) Arc colorings

$$a_7 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-0.391489u^{27}-0.470374u^{26}+\cdots-3.81459u+0.996493\\-0.258207u^{27}-0.125077u^{26}+\cdots-0.732283u-0.0337376\end{pmatrix}$$
$$a_8 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.413924u^{27}-0.597145u^{26}+\cdots-5.26760u-0.220183\\-0.0582121u^{27}-0.0675302u^{26}+\cdots+0.340267u+0.293866\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-0.477856u^{27}-0.996708u^{26}+\cdots-13.3082u-4.41263\\-0.112376u^{27}-0.407794u^{26}+\cdots-2.58251u-1.23931\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0.954572u^{27}+1.16393u^{26}+\cdots+13.8778u+5.23994\\0.578242u^{27}+0.838640u^{26}+\cdots+6.12426u+2.98085\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-0.553377u^{27}-0.805395u^{26}+\cdots-4.19380u-0.220141\\-0.289887u^{27}-0.549598u^{26}+\cdots-2.44368u-1.38590\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^3\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-0.344773u^{27}-0.559849u^{26}+\cdots-12.5913u-2.43833\\-0.107385u^{27}-0.0325593u^{26}+\cdots-1.42978u-0.191489\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0.122884u^{27}+0.0337522u^{26}+\cdots-7.99636u-2.60537\\-0.0118276u^{27}+0.0954702u^{26}+\cdots-1.56095u-0.292717\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{38649811188}{1360028627}u^{27}-\frac{4406004267}{1360028627}u^{26}+\cdots-\frac{49326955058}{1360028627}u-\frac{19445189018}{1360028627}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{14} + 21u^{13} + \cdots - 66u + 1)^2$
c_2, c_4	$(u^{14} - 3u^{13} + \cdots - 14u + 1)^2$
c_3	$(u^{14} - u^{13} + \cdots - 2u + 1)^2$
c_5, c_7, c_9 c_{11}	$u^{28} - 2u^{27} + \cdots - 12u + 4$
c_6, c_{10}	$u^{28} + 5u^{27} + \cdots + 251482u + 48331$
c_8, c_{12}	$u^{28} + 16u^{27} + \cdots - 104u + 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{14} - 59y^{13} + \cdots - 3858y + 1)^2$
c_2, c_4	$(y^{14} + 21y^{13} + \cdots - 66y + 1)^2$
c_3	$(y^{14} - 3y^{13} + \cdots - 14y + 1)^2$
c_5, c_7, c_9 c_{11}	$y^{28} - 16y^{27} + \cdots + 104y + 16$
c_6, c_{10}	$y^{28} + 29y^{27} + \cdots + 1236737368y + 2335885561$
c_8, c_{12}	$y^{28} - 8y^{27} + \cdots - 14112y + 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.944960 + 0.389379I$ $a = 1.68750 - 1.23439I$ $b = 1.31224 - 1.71461I$	$-0.06814 + 4.27159I$	$-1.66019 - 6.67920I$
$u = -0.944960 - 0.389379I$ $a = 1.68750 + 1.23439I$ $b = 1.31224 + 1.71461I$	$-0.06814 - 4.27159I$	$-1.66019 + 6.67920I$
$u = 0.167349 + 1.046550I$ $a = -1.56673 - 0.27072I$ $b = 0.750716 - 1.143810I$	$-9.38462 + 8.62895I$	$-3.88181 - 4.95064I$
$u = 0.167349 - 1.046550I$ $a = -1.56673 + 0.27072I$ $b = 0.750716 + 1.143810I$	$-9.38462 - 8.62895I$	$-3.88181 + 4.95064I$
$u = -0.071840 + 1.060620I$ $a = -1.156110 - 0.491907I$ $b = 0.349038 - 0.236829I$	$-9.86399 - 1.83809I$	$-4.68358 + 0.51446I$
$u = -0.071840 - 1.060620I$ $a = -1.156110 + 0.491907I$ $b = 0.349038 + 0.236829I$	$-9.86399 + 1.83809I$	$-4.68358 - 0.51446I$
$u = 0.930250 + 0.540185I$ $a = -0.39656 - 1.39984I$ $b = 0.82318 - 1.20145I$	0.178509	$-1.66494 + 0.I$
$u = 0.930250 - 0.540185I$ $a = -0.39656 + 1.39984I$ $b = 0.82318 + 1.20145I$	0.178509	$-1.66494 + 0.I$
$u = -0.967293 + 0.545264I$ $a = 1.19253 - 1.46190I$ $b = -0.09011 - 2.03761I$	$0.97692 + 4.37418I$	$1.48632 - 5.65859I$
$u = -0.967293 - 0.545264I$ $a = 1.19253 + 1.46190I$ $b = -0.09011 + 2.03761I$	$0.97692 - 4.37418I$	$1.48632 + 5.65859I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.120270+0.185451I$ $a=\ 0.336290+0.781567I$ $b=\ 0.0603554+0.0344181I$	$-2.83422+5.28701I$	$-7.29071-5.64998I$
$u=-1.120270-0.185451I$ $a=\ 0.336290-0.781567I$ $b=\ 0.0603554-0.0344181I$	$-2.83422-5.28701I$	$-7.29071+5.64998I$
$u=\ 0.661296+0.516335I$ $a=\ 1.39638-1.24212I$ $b=\ 1.77737+0.58800I$	$0.97692-4.37418I$	$1.48632+5.65859I$
$u=\ 0.661296-0.516335I$ $a=\ 1.39638+1.24212I$ $b=\ 1.77737-0.58800I$	$0.97692+4.37418I$	$1.48632-5.65859I$
$u=\ 0.986837+0.702176I$ $a=-1.43243-0.29298I$ $b=-0.95756-1.34618I$	$-2.83422-5.28701I$	$-7.29071+5.64998I$
$u=\ 0.986837-0.702176I$ $a=-1.43243+0.29298I$ $b=-0.95756+1.34618I$	$-2.83422+5.28701I$	$-7.29071-5.64998I$
$u=-0.576536+0.519983I$ $a=-1.80604-0.49276I$ $b=-1.20129+1.05231I$	2.08354	$4.91356+0.I$
$u=-0.576536-0.519983I$ $a=-1.80604+0.49276I$ $b=-1.20129-1.05231I$	2.08354	$4.91356+0.I$
$u=-1.296330+0.525251I$ $a=-1.29110+1.10158I$ $b=-1.32954+2.42151I$	$-9.38462+8.62895I$	$-3.88181-4.95064I$
$u=-1.296330-0.525251I$ $a=-1.29110-1.10158I$ $b=-1.32954-2.42151I$	$-9.38462-8.62895I$	$-3.88181+4.95064I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.323650 + 0.464051I$ $a = 0.131487 - 0.110768I$ $b = -0.532418 - 0.972507I$	$-9.86399 - 1.83809I$	$-4.68358 + 0.51446I$
$u = 1.323650 - 0.464051I$ $a = 0.131487 + 0.110768I$ $b = -0.532418 + 0.972507I$	$-9.86399 + 1.83809I$	$-4.68358 - 0.51446I$
$u = -1.39944 + 0.38754I$ $a = 0.184103 - 0.013266I$ $b = 1.29482 - 1.20212I$	$-14.5006 - 3.5759I$	$-7.59435 + 2.22005I$
$u = -1.39944 - 0.38754I$ $a = 0.184103 + 0.013266I$ $b = 1.29482 + 1.20212I$	$-14.5006 + 3.5759I$	$-7.59435 - 2.22005I$
$u = 1.38126 + 0.46460I$ $a = 1.074130 + 0.763312I$ $b = 1.81408 + 1.69170I$	$-14.5006 - 3.5759I$	$-7.59435 + 2.22005I$
$u = 1.38126 - 0.46460I$ $a = 1.074130 - 0.763312I$ $b = 1.81408 - 1.69170I$	$-14.5006 + 3.5759I$	$-7.59435 - 2.22005I$
$u = -0.073973 + 0.383908I$ $a = 3.89655 + 0.21962I$ $b = 0.429118 + 0.189827I$	$-0.06814 + 4.27159I$	$-1.66019 - 6.67920I$
$u = -0.073973 - 0.383908I$ $a = 3.89655 - 0.21962I$ $b = 0.429118 - 0.189827I$	$-0.06814 - 4.27159I$	$-1.66019 + 6.67920I$

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

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

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

$$a_5 = \begin{pmatrix} u^3 \\ u^3 - u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^3 + 2u \\ 2u^3 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} 3u^2 - 3 \\ u^2 - 3 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -2 \\ -u^2 - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 12u^2 - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = -2.23205 - 0.13397I$ $b = -1.86603 - 1.50000I$	$-6.08965I$	$-2.00000 + 10.39230I$
$u = 0.866025 - 0.500000I$ $a = -2.23205 + 0.13397I$ $b = -1.86603 + 1.50000I$	$6.08965I$	$-2.00000 - 10.39230I$
$u = -0.866025 + 0.500000I$ $a = 1.23205 - 1.86603I$ $b = -0.13397 - 1.50000I$	$6.08965I$	$-2.00000 - 10.39230I$
$u = -0.866025 - 0.500000I$ $a = 1.23205 + 1.86603I$ $b = -0.13397 + 1.50000I$	$-6.08965I$	$-2.00000 + 10.39230I$

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

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

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

$$a_5 = \begin{pmatrix} u^3 \\ u^3 - u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u^3 - 2u^2 + u + 1 \\ 2u^3 - 2u^2 - u + 3 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = 0.36603 + 1.36603I$ $b = -0.13397 + 1.50000I$	$2.02988I$	$-2.00000 - 3.46410I$
$u = 0.866025 - 0.500000I$ $a = 0.36603 - 1.36603I$ $b = -0.13397 - 1.50000I$	$-2.02988I$	$-2.00000 + 3.46410I$
$u = -0.866025 + 0.500000I$ $a = -1.36603 - 0.36603I$ $b = -1.86603 + 1.50000I$	$-2.02988I$	$-2.00000 + 3.46410I$
$u = -0.866025 - 0.500000I$ $a = -1.36603 + 0.36603I$ $b = -1.86603 - 1.50000I$	$2.02988I$	$-2.00000 - 3.46410I$

V. $I^u_5 = \langle -u^3 + u^2 + b - u - 1,\ u^2 + a - u,\ u^4 - u^2 + 1\rangle$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

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

$$a_5 = \begin{pmatrix} u^3 \\ u^3 - u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u^2 + 1 \\ 3u^2 - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 2u^2 \\ 3u^2 - 3 \end{pmatrix}$$

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = 0.366025 - 0.366025I$ $b = 1.36603 + 0.63397I$	$-2.02988I$	$-2.00000 + 3.46410I$
$u = 0.866025 - 0.500000I$ $a = 0.366025 + 0.366025I$ $b = 1.36603 - 0.63397I$	$2.02988I$	$-2.00000 - 3.46410I$
$u = -0.866025 + 0.500000I$ $a = -1.36603 + 1.36603I$ $b = -0.36603 + 2.36603I$	$2.02988I$	$-2.00000 - 3.46410I$
$u = -0.866025 - 0.500000I$ $a = -1.36603 - 1.36603I$ $b = -0.36603 - 2.36603I$	$-2.02988I$	$-2.00000 + 3.46410I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = -0.732051 - 1.000000I$ $b = -0.366025 - 0.633975I$	$-2.02988I$	$-2.00000 + 3.46410I$
$u = 0.866025 - 0.500000I$ $a = -0.732051 + 1.000000I$ $b = -0.366025 + 0.633975I$	$2.02988I$	$-2.00000 - 3.46410I$
$u = -0.866025 + 0.500000I$ $a = 2.73205 - 1.00000I$ $b = 1.36603 - 2.36603I$	$2.02988I$	$-2.00000 - 3.46410I$
$u = -0.866025 - 0.500000I$ $a = 2.73205 + 1.00000I$ $b = 1.36603 + 2.36603I$	$-2.02988I$	$-2.00000 + 3.46410I$

VII. $I_7^u = \langle -u^3 + b - u,\ a - u,\ u^4 + u^3 + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_7^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.518913 + 0.666610I$ $a = 0.518913 + 0.666610I$ $b = -0.033125 + 0.908884I$	-1.64493	-6.00000
$u = 0.518913 - 0.666610I$ $a = 0.518913 - 0.666610I$ $b = -0.033125 - 0.908884I$	-1.64493	-6.00000
$u = -1.018910 + 0.602565I$ $a = -1.018910 + 0.602565I$ $b = -0.96687 + 2.26050I$	-1.64493	-6.00000
$u = -1.018910 - 0.602565I$ $a = -1.018910 - 0.602565I$ $b = -0.96687 - 2.26050I$	-1.64493	-6.00000

VIII. $\boldsymbol{I_8^u = \langle a^3 + 2a^2 + b + 3a + 1,\ a^4 + 3a^3 + 6a^2 + 4a + 1,\ u - 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_8^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -0.447962 + 0.242275I$ $b = 0.070951 - 0.424335I$	-1.64493	-6.00000
$u = 1.00000$ $a = -0.447962 - 0.242275I$ $b = 0.070951 + 0.424335I$	-1.64493	-6.00000
$u = 1.00000$ $a = -1.05204 + 1.65794I$ $b = -2.07095 + 1.05537I$	-1.64493	-6.00000
$u = 1.00000$ $a = -1.05204 - 1.65794I$ $b = -2.07095 - 1.05537I$	-1.64493	-6.00000

IX. $I^u_9 = \langle b-2,\ a-1,\ u-1\rangle$

(i) Arc colorings

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

$a_{12} = \begin{pmatrix}0\\1\end{pmatrix}$

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

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

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

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

$a_5 = \begin{pmatrix}2\\3\end{pmatrix}$

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

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

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

$a_{10} = \begin{pmatrix}2\\3\end{pmatrix}$

$a_9 = \begin{pmatrix}3\\4\end{pmatrix}$

(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_4	$u-1$
c_3, c_5, c_6 c_7, c_8, c_9 c_{10}, c_{11}, c_{12}	$u+1$

(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_9^u		$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000		
$a =$	1.00000	−1.64493	−6.00000
$b =$	2.00000		

X. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)(u^2-u+1)^8(u^4+3u^3+6u^2+4u+1)^2$ $\cdot((u^{14}+21u^{13}+\cdots-66u+1)^2)(u^{16}+16u^{15}+\cdots+1760u+256)$
c_2	$(u-1)(u^2+u+1)^8(u^4-u^3+2u^2+1)^2(u^{14}-3u^{13}+\cdots-14u+1)^2$ $\cdot(u^{16}-4u^{15}+\cdots-56u+16)$
c_3	$(u+1)(u^4-u^2+1)^4(u^4-u^3+1)^2(u^{14}-u^{13}+\cdots-2u+1)^2$ $\cdot(u^{16}+4u^{15}+\cdots+12u+4)$
c_4	$(u-1)(u^2-u+1)^8(u^4-u^3+2u^2+1)^2(u^{14}-3u^{13}+\cdots-14u+1)^2$ $\cdot(u^{16}-4u^{15}+\cdots-56u+16)$
c_5, c_7, c_9 c_{11}	$((u+1)^5)(u^4-u^2+1)^4(u^4-u^3+1)(u^{16}-u^{15}+\cdots-2u+1)$ $\cdot(u^{28}-2u^{27}+\cdots-12u+4)$
c_6	$(u+1)(u^2+2u+2)^2(u^4-3u^3+\cdots-4u+1)(u^4-2u^3+\cdots-4u+4)$ $\cdot(u^4-2u^3+5u^2-4u+1)(u^4-u^3+1)(u^4+4u^3+5u^2+2u+1)$ $\cdot(u^{16}-u^{15}+\cdots+64u+16)(u^{28}+5u^{27}+\cdots+251482u+48331)$
c_8	$((u+1)^5)(u^2-u+1)^8(u^4+u^3+2u^2+1)(u^{16}+11u^{15}+\cdots+6u+1)$ $\cdot(u^{28}+16u^{27}+\cdots-104u+16)$
c_{10}	$(u+1)(u^2-2u+2)^2(u^4-4u^3+\cdots-2u+1)(u^4-3u^3+\cdots-4u+1)$ $\cdot(u^4-u^3+1)(u^4+2u^3+2u^2+4u+4)(u^4+2u^3+5u^2+4u+1)$ $\cdot(u^{16}-u^{15}+\cdots+64u+16)(u^{28}+5u^{27}+\cdots+251482u+48331)$
c_{12}	$((u+1)^5)(u^2+u+1)^8(u^4+u^3+2u^2+1)(u^{16}+11u^{15}+\cdots+6u+1)$ $\cdot(u^{28}+16u^{27}+\cdots-104u+16)$

XI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)(y^2+y+1)^8(y^4+3y^3+14y^2-4y+1)^2$ $\cdot\,(y^{14}-59y^{13}+\cdots-3858y+1)^2$ $\cdot\,(y^{16}-24y^{15}+\cdots-508416y+65536)$
c_2, c_4	$(y-1)(y^2+y+1)^8(y^4+3y^3+6y^2+4y+1)^2$ $\cdot\,((y^{14}+21y^{13}+\cdots-66y+1)^2)(y^{16}+16y^{15}+\cdots+1760y+256)$
c_3	$(y-1)(y^2-y+1)^8(y^4-y^3+2y^2+1)^2(y^{14}-3y^{13}+\cdots-14y+1)^2$ $\cdot\,(y^{16}-4y^{15}+\cdots-56y+16)$
c_5, c_7, c_9 c_{11}	$((y-1)^5)(y^2-y+1)^8(y^4-y^3+2y^2+1)(y^{16}-11y^{15}+\cdots-6y+1)$ $\cdot\,(y^{28}-16y^{27}+\cdots+104y+16)$
c_6, c_{10}	$(y-1)(y^2+4)^2(y^4-4y^2+16)(y^4-6y^3+11y^2+6y+1)$ $\cdot\,(y^4-y^3+2y^2+1)(y^4+3y^3+\cdots-4y+1)(y^4+6y^3+\cdots-6y+1)$ $\cdot\,(y^{16}+25y^{15}+\cdots+256y+256)$ $\cdot\,(y^{28}+29y^{27}+\cdots+1236737368y+2335885561)$
c_8, c_{12}	$(y-1)^5(y^2+y+1)^8(y^4+3y^3+6y^2+4y+1)$ $\cdot\,(y^{16}-7y^{15}+\cdots+10y+1)(y^{28}-8y^{27}+\cdots-14112y+256)$