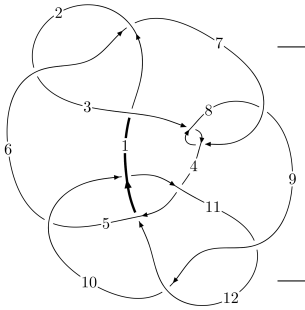
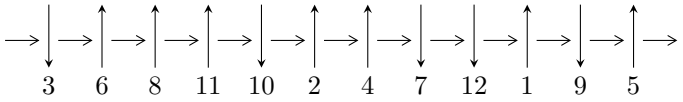
$12a_{0334}$ $(K12a_{0334})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 2.06298 \times 10^{20} u^{52} + 1.60476 \times 10^{20} u^{51} + \cdots + 4.29074 \times 10^{20} b - 4.12339 \times 10^{20},$$
$$1.99532 \times 10^{20} u^{52} + 2.05042 \times 10^{20} u^{51} + \cdots + 2.14537 \times 10^{20} a - 6.01161 \times 10^{20},\ u^{53} + u^{52} + \cdots - u + 1 \rangle$$
$$I_2^u = \langle 8.20708 \times 10^{90} u^{81} + 1.10415 \times 10^{91} u^{80} + \cdots + 2.42746 \times 10^{91} b + 4.21770 \times 10^{91},$$
$$- 1.38634 \times 10^{91} u^{81} + 4.31343 \times 10^{91} u^{80} + \cdots + 4.12668 \times 10^{92} a + 3.38112 \times 10^{93},$$
$$u^{82} + u^{81} + \cdots + 80u + 17 \rangle$$
$$I_3^u = \langle a^4 - a^3 u + 2a^2 - au + b - a + u + 2,\ a^5 + a^4 + 2a^3 + a^2 + a + 1,\ u^2 + 1 \rangle$$
$$I_4^u = \langle 4b - 1,\ 2a - 1,\ u + 1 \rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 146 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.

$\boldsymbol{I_1^u = \langle 2.06\times 10^{20}u^{52}+1.60\times 10^{20}u^{51}+\cdots+4.29\times 10^{20}b-4.12\times 10^{20},\ 2.00\times 10^{20}u^{52}+2.05\times 10^{20}u^{51}+\cdots+2.15\times 10^{20}a-6.01\times 10^{20},\ u^{53}+u^{52}+\cdots-u+1\rangle}$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix}0\\u\end{pmatrix}$$

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

$$a_7 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$

$$a_1 = \begin{pmatrix}u^2+1\\u^2\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}-0.930057u^{52}-0.955742u^{51}+\cdots-6.21940u+2.80213\\-0.480798u^{52}-0.374006u^{51}+\cdots-2.83945u+0.960996\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}-1.04871u^{52}-0.780472u^{51}+\cdots-8.33773u+3.26868\\0.0764895u^{52}+0.115237u^{51}+\cdots-1.80155u+0.599031\end{pmatrix}$$

$$a_5 = \begin{pmatrix}0.000620096u^{52}+0.181918u^{51}+\cdots-5.81545u+4.31836\\-0.579013u^{52}-0.551580u^{51}+\cdots-2.53269u+0.624293\end{pmatrix}$$

$$a_4 = \begin{pmatrix}-0.0312500u^{51}-0.0312500u^{50}+\cdots+0.0312500u+0.968750\\-u^2\end{pmatrix}$$

$$a_8 = \begin{pmatrix}-0.0312500u^{52}-0.0312500u^{51}+\cdots+0.0312500u^2+1.96875u\\u\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}-0.295508u^{52}-0.746196u^{51}+\cdots-5.12386u+1.87778\\0.0786937u^{52}-0.0771515u^{51}+\cdots-0.889392u+0.294843\end{pmatrix}$$

$$a_9 = \begin{pmatrix}0.0312500u^{52}+0.0312500u^{51}+\cdots-0.0312500u^2-1.96875u\\-u^5-u^3-u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{2512848915749488921699}{171629768497463114137 6}u^{52}+\frac{46238999124133173149}{13408575663864305792}u^{51}+\cdots+\frac{661758164486529911 2413}{858148842487315570688}u-\frac{24193642510293641802 53}{171629768497463114137 6}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_8	$u^{53} + 23u^{52} + \cdots - 11u - 1$
c_2, c_3, c_6 c_7	$u^{53} - u^{52} + \cdots - u - 1$
c_4	$2(2u^{53} + 7u^{52} + \cdots - 449u - 106)$
c_5	$2(2u^{53} + 19u^{52} + \cdots - 27u - 22)$
c_9, c_{11}	$u^{53} - 2u^{52} + \cdots + 145u - 16$
c_{10}	$u^{53} + 9u^{52} + \cdots + 44u - 32$
c_{12}	$u^{53} - 11u^{52} + \cdots + 12u - 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$y^{53} + 19y^{52} + \cdots + 17y - 1$
c_2, c_3, c_6 c_7	$y^{53} + 23y^{52} + \cdots - 11y - 1$
c_4	$4(4y^{53} - 109y^{52} + \cdots + 600797y - 11236)$
c_5	$4(4y^{53} - 253y^{52} + \cdots - 47627y - 484)$
c_9, c_{11}	$y^{53} - 40y^{52} + \cdots + 9057y - 256$
c_{10}	$y^{53} + 9y^{52} + \cdots - 3504y - 1024$
c_{12}	$y^{53} + 5y^{52} + \cdots - 40y - 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.668388 + 0.804816I$ $a = -0.286952 - 0.841129I$ $b = 1.30427 - 1.07663I$	$3.52267 + 5.89067I$	$5.80325 - 7.99379I$
$u = 0.668388 - 0.804816I$ $a = -0.286952 + 0.841129I$ $b = 1.30427 + 1.07663I$	$3.52267 - 5.89067I$	$5.80325 + 7.99379I$
$u = 0.885875 + 0.312846I$ $a = 1.58012 + 0.57776I$ $b = 0.249661 + 1.267570I$	$-1.48025 - 8.82229I$	$2.86158 + 4.69458I$
$u = 0.885875 - 0.312846I$ $a = 1.58012 - 0.57776I$ $b = 0.249661 - 1.267570I$	$-1.48025 + 8.82229I$	$2.86158 - 4.69458I$
$u = 0.488135 + 0.771928I$ $a = -0.297346 + 1.142240I$ $b = -0.098380 + 1.389640I$	$-1.79557 + 4.79512I$	$-1.34672 - 10.51121I$
$u = 0.488135 - 0.771928I$ $a = -0.297346 - 1.142240I$ $b = -0.098380 - 1.389640I$	$-1.79557 - 4.79512I$	$-1.34672 + 10.51121I$
$u = -1.082370 + 0.233203I$ $a = -0.313022 - 0.099491I$ $b = -0.116005 + 0.128996I$	$0.067068 + 0.198707I$	$-6.3019 - 29.2641I$
$u = -1.082370 - 0.233203I$ $a = -0.313022 + 0.099491I$ $b = -0.116005 - 0.128996I$	$0.067068 - 0.198707I$	$-6.3019 + 29.2641I$
$u = -0.686446 + 0.549470I$ $a = 0.797892 - 0.702983I$ $b = -0.185476 - 0.857683I$	$1.60260 - 1.16734I$	$6.57040 + 3.72731I$
$u = -0.686446 - 0.549470I$ $a = 0.797892 + 0.702983I$ $b = -0.185476 + 0.857683I$	$1.60260 + 1.16734I$	$6.57040 - 3.72731I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.328034 + 1.084130I$ $a = 0.133474 - 1.011380I$ $b = -0.127047 - 0.619492I$	$-10.08720 + 6.08959I$	$-7.49622 - 8.58423I$
$u = 0.328034 - 1.084130I$ $a = 0.133474 + 1.011380I$ $b = -0.127047 + 0.619492I$	$-10.08720 - 6.08959I$	$-7.49622 + 8.58423I$
$u = -0.639214 + 0.938411I$ $a = -0.498896 + 0.213519I$ $b = 0.042019 + 1.288230I$	$2.69803 - 4.29240I$	$5.39369 + 5.58339I$
$u = -0.639214 - 0.938411I$ $a = -0.498896 - 0.213519I$ $b = 0.042019 - 1.288230I$	$2.69803 + 4.29240I$	$5.39369 - 5.58339I$
$u = -0.833257 + 0.778192I$ $a = 0.816570 - 0.328287I$ $b = 0.235105 - 0.990515I$	$1.75225 - 0.51446I$	$5.84851 - 3.70601I$
$u = -0.833257 - 0.778192I$ $a = 0.816570 + 0.328287I$ $b = 0.235105 + 0.990515I$	$1.75225 + 0.51446I$	$5.84851 + 3.70601I$
$u = -0.526363 + 0.667694I$ $a = 1.77266 + 2.14536I$ $b = 1.63014 + 0.06741I$	$-0.55286 - 1.95233I$	$-0.23618 - 5.29610I$
$u = -0.526363 - 0.667694I$ $a = 1.77266 - 2.14536I$ $b = 1.63014 - 0.06741I$	$-0.55286 + 1.95233I$	$-0.23618 + 5.29610I$
$u = -0.355899 + 1.098010I$ $a = -0.914127 - 0.977251I$ $b = -0.473545 - 0.727776I$	$-10.41080 + 2.52581I$	$-5.67621 + 2.33570I$
$u = -0.355899 - 1.098010I$ $a = -0.914127 + 0.977251I$ $b = -0.473545 + 0.727776I$	$-10.41080 - 2.52581I$	$-5.67621 - 2.33570I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.734405 + 0.375376I$ $a = -1.167300 - 0.462515I$ $b = 0.125668 - 1.354120I$	$2.50533 - 3.21218I$	$6.47711 + 3.14636I$
$u = 0.734405 - 0.375376I$ $a = -1.167300 + 0.462515I$ $b = 0.125668 + 1.354120I$	$2.50533 + 3.21218I$	$6.47711 - 3.14636I$
$u = -0.476735 + 1.090590I$ $a = 0.837733 + 0.594251I$ $b = -0.168261 + 0.426397I$	$-4.11384 - 2.65488I$	0
$u = -0.476735 - 1.090590I$ $a = 0.837733 - 0.594251I$ $b = -0.168261 - 0.426397I$	$-4.11384 + 2.65488I$	0
$u = 0.745113 + 0.940742I$ $a = 0.227342 + 1.177620I$ $b = -1.20324 + 1.37822I$	$0.77711 + 11.19170I$	$0. - 10.51592I$
$u = 0.745113 - 0.940742I$ $a = 0.227342 - 1.177620I$ $b = -1.20324 - 1.37822I$	$0.77711 - 11.19170I$	$0. + 10.51592I$
$u = 0.012932 + 0.796961I$ $a = -0.54661 + 1.60348I$ $b = -0.302926 + 0.786949I$	$-8.28369 - 4.33865I$	$3.59300 + 2.46883I$
$u = 0.012932 - 0.796961I$ $a = -0.54661 - 1.60348I$ $b = -0.302926 - 0.786949I$	$-8.28369 + 4.33865I$	$3.59300 - 2.46883I$
$u = 0.518764 + 1.094270I$ $a = -1.11519 + 0.88338I$ $b = -1.165260 - 0.045151I$	$-3.47528 + 6.51067I$	$0. - 9.23313I$
$u = 0.518764 - 1.094270I$ $a = -1.11519 - 0.88338I$ $b = -1.165260 + 0.045151I$	$-3.47528 - 6.51067I$	$0. + 9.23313I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.360598 + 0.663100I$ $a = -0.1286910 - 0.0067991I$ $b = -1.49656 + 0.86506I$	$-3.51640 + 1.45258I$	$-4.16595 - 4.82658I$
$u = \ 0.360598 - 0.663100I$ $a = -0.1286910 + 0.0067991I$ $b = -1.49656 - 0.86506I$	$-3.51640 - 1.45258I$	$-4.16595 + 4.82658I$
$u = -0.502393 + 1.140790I$ $a = -0.078413 - 0.487074I$ $b = -1.30590 - 1.98115I$	$-7.66286 - 6.07116I$	0
$u = -0.502393 - 1.140790I$ $a = -0.078413 + 0.487074I$ $b = -1.30590 + 1.98115I$	$-7.66286 + 6.07116I$	0
$u = \ 0.535551 + 1.136960I$ $a = \ 1.04842 - 2.35451I$ $b = \ 2.80983 - 1.99427I$	$-4.81372 + 7.90988I$	0
$u = \ 0.535551 - 1.136960I$ $a = \ 1.04842 + 2.35451I$ $b = \ 2.80983 + 1.99427I$	$-4.81372 - 7.90988I$	0
$u = -0.532362 + 1.165170I$ $a = -0.316339 - 0.652315I$ $b = \ 0.45485 - 1.39382I$	$-7.14528 - 10.40640I$	0
$u = -0.532362 - 1.165170I$ $a = -0.316339 + 0.652315I$ $b = \ 0.45485 + 1.39382I$	$-7.14528 + 10.40640I$	0
$u = -0.507169 + 0.506059I$ $a = -2.30852 - 2.83554I$ $b = -1.296690 + 0.107271I$	$-0.684418 - 0.948826I$	$-0.1446 + 19.9877I$
$u = -0.507169 - 0.506059I$ $a = -2.30852 + 2.83554I$ $b = -1.296690 - 0.107271I$	$-0.684418 + 0.948826I$	$-0.1446 - 19.9877I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.575449 + 1.149730I$ $a = 0.566641 + 0.921275I$ $b = -0.57415 + 1.69849I$	$-2.39951 + 8.82556I$	0
$u = 0.575449 - 1.149730I$ $a = 0.566641 - 0.921275I$ $b = -0.57415 - 1.69849I$	$-2.39951 - 8.82556I$	0
$u = -0.570687 + 1.179090I$ $a = -0.317122 + 0.893231I$ $b = 1.31695 + 2.13247I$	$-2.39245 - 13.37930I$	0
$u = -0.570687 - 1.179090I$ $a = -0.317122 - 0.893231I$ $b = 1.31695 - 2.13247I$	$-2.39245 + 13.37930I$	0
$u = -0.585845 + 1.224270I$ $a = 0.230425 - 1.261910I$ $b = -1.35761 - 2.39508I$	$-7.1037 - 19.7990I$	0
$u = -0.585845 - 1.224270I$ $a = 0.230425 + 1.261910I$ $b = -1.35761 + 2.39508I$	$-7.1037 + 19.7990I$	0
$u = 0.582720 + 1.244220I$ $a = 0.054678 - 0.544611I$ $b = 0.929131 - 0.998070I$	$-6.21709 + 11.57740I$	0
$u = 0.582720 - 1.244220I$ $a = 0.054678 + 0.544611I$ $b = 0.929131 + 0.998070I$	$-6.21709 - 11.57740I$	0
$u = 0.518365 + 0.233763I$ $a = 1.56899 - 0.12441I$ $b = -0.413003 - 0.501825I$	$-2.00575 - 1.39990I$	$0.13252 + 2.66596I$
$u = 0.518365 - 0.233763I$ $a = 1.56899 + 0.12441I$ $b = -0.413003 + 0.501825I$	$-2.00575 + 1.39990I$	$0.13252 - 2.66596I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.094948 + 0.500791I$ $a = 1.09549 - 1.74373I$ $b = -0.184132 - 0.666756I$	$-1.65145 - 1.39860I$	$-0.71853 + 3.02391I$
$u = 0.094948 - 0.500791I$ $a = 1.09549 + 1.74373I$ $b = -0.184132 + 0.666756I$	$-1.65145 + 1.39860I$	$-0.71853 - 3.02391I$
$u = -0.501079$ $a = 0.616206$ $b = 0.491104$	0.979888	11.0840

II. $I_2^u = \langle 8.21 \times 10^{90} u^{81} + 1.10 \times 10^{91} u^{80} + \cdots + 2.43 \times 10^{91} b + 4.22 \times 10^{91},\ -1.39 \times 10^{91} u^{81} + 4.31 \times 10^{91} u^{80} + \cdots + 4.13 \times 10^{92} a + 3.38 \times 10^{93},\ u^{82} + u^{81} + \cdots + 80u + 17 \rangle$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0335946u^{81} - 0.104526u^{80} + \cdots - 30.8539u - 8.19333 \\ -0.338094u^{81} - 0.454858u^{80} + \cdots - 18.9801u - 1.73750 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.115101u^{81} - 0.232328u^{80} + \cdots - 37.2193u - 9.00600 \\ -0.372443u^{81} - 0.392556u^{80} + \cdots - 10.9756u - 0.449622 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.312769u^{81} - 0.318140u^{80} + \cdots - 9.62030u - 2.11610 \\ 0.0743269u^{81} + 0.840095u^{80} + \cdots + 69.4199u + 14.0460 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.146314u^{81} - 0.133467u^{80} + \cdots + 2.18765u + 1.24972 \\ 0.0959173u^{81} + 0.176156u^{80} + \cdots + 1.45965u + 0.781618 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.0588235u^{81} + 0.0588235u^{80} + \cdots + 14.1176u + 4.70588 \\ 0.0128460u^{81} + 0.108763u^{80} + \cdots + 11.9548u + 2.48733 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.0580723u^{81} - 0.149404u^{80} + \cdots - 25.1399u - 5.85705 \\ -0.235936u^{81} - 0.0863109u^{80} + \cdots + 11.0930u + 3.00489 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.0214155u^{81} - 0.0371577u^{80} + \cdots - 21.0094u - 6.33648 \\ -0.0261267u^{81} - 0.204159u^{80} + \cdots - 15.5248u - 3.12218 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -0.241656u^{81} - 0.239165u^{80} + \cdots - 13.5265u + 0.445704$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_8	$u^{82} + 47u^{81} + \cdots + 1760u + 289$
c_2, c_3, c_6 c_7	$u^{82} - u^{81} + \cdots - 80u + 17$
c_4	$(u^{41} - u^{40} + \cdots + 289u + 77)^2$
c_5	$(u^{41} - 3u^{40} + \cdots - 129u + 31)^2$
c_9, c_{11}	$(u^{41} - u^{40} + \cdots + 7u + 1)^2$
c_{10}	$(u^{41} + 7u^{40} + \cdots - u - 1)^2$
c_{12}	$(u^{41} + 3u^{40} + \cdots + u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_8	$y^{82} - 25y^{81} + \cdots + 237460y + 83521$
c_2, c_3, c_6 c_7	$y^{82} + 47y^{81} + \cdots + 1760y + 289$
c_4	$(y^{41} - 25y^{40} + \cdots - 76331y - 5929)^2$
c_5	$(y^{41} - 45y^{40} + \cdots + 24081y - 961)^2$
c_9, c_{11}	$(y^{41} - 29y^{40} + \cdots - 7y - 1)^2$
c_{10}	$(y^{41} + 3y^{40} + \cdots - 7y - 1)^2$
c_{12}	$(y^{41} + 7y^{40} + \cdots - 3y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.985492 + 0.187431I$ $a = -0.601056 - 0.061606I$ $b = -0.123823 - 0.448139I$	$-2.99088 - 5.96215I$	$-2.24062 + 8.95093I$
$u = 0.985492 - 0.187431I$ $a = -0.601056 + 0.061606I$ $b = -0.123823 + 0.448139I$	$-2.99088 + 5.96215I$	$-2.24062 - 8.95093I$
$u = 0.653301 + 0.771321I$ $a = -0.722807 - 0.195367I$ $b = 0.054351 - 1.396580I$	$3.61608 - 0.82118I$	$7.22724 + 0.I$
$u = 0.653301 - 0.771321I$ $a = -0.722807 + 0.195367I$ $b = 0.054351 + 1.396580I$	$3.61608 + 0.82118I$	$7.22724 + 0.I$
$u = -0.945615 + 0.225342I$ $a = 1.57967 - 0.70411I$ $b = 0.241504 - 1.236450I$	$-4.0673 + 14.2581I$	$0. - 8.23400I$
$u = -0.945615 - 0.225342I$ $a = 1.57967 + 0.70411I$ $b = 0.241504 + 1.236450I$	$-4.0673 - 14.2581I$	$0. + 8.23400I$
$u = -0.439234 + 0.938019I$ $a = -0.92316 - 1.30144I$ $b = -1.227420 - 0.040586I$	$-1.28254 - 2.04071I$	0
$u = -0.439234 - 0.938019I$ $a = -0.92316 + 1.30144I$ $b = -1.227420 + 0.040586I$	$-1.28254 + 2.04071I$	0
$u = 0.276393 + 0.921871I$ $a = 0.764527 - 0.804946I$ $b = -0.295593 - 0.452709I$	$-1.82452 - 1.30012I$	$0. + 4.02639I$
$u = 0.276393 - 0.921871I$ $a = 0.764527 + 0.804946I$ $b = -0.295593 + 0.452709I$	$-1.82452 + 1.30012I$	$0. - 4.02639I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.701838+0.621645I$ $a=-0.227828+0.774426I$ $b=\ \ 1.052510+0.712403I$	$3.61608-0.82118I$	$7.22724+1.08764I$
$u=-0.701838-0.621645I$ $a=-0.227828-0.774426I$ $b=\ \ 1.052510-0.712403I$	$3.61608+0.82118I$	$7.22724-1.08764I$
$u=\ \ 0.845750+0.662432I$ $a=\ \ 1.117590+0.331221I$ $b=\ \ 0.314324+1.186560I$	$1.60464-5.37316I$	0
$u=\ \ 0.845750-0.662432I$ $a=\ \ 1.117590-0.331221I$ $b=\ \ 0.314324-1.186560I$	$1.60464+5.37316I$	0
$u=\ \ 0.125396+0.890425I$ $a=\ \ 0.839410+1.046050I$ $b=-3.40553+2.53563I$	$-5.21373+0.70569I$	$-0.73633+1.49377I$
$u=\ \ 0.125396-0.890425I$ $a=\ \ 0.839410-1.046050I$ $b=-3.40553-2.53563I$	$-5.21373-0.70569I$	$-0.73633-1.49377I$
$u=\ \ 0.064515+1.103490I$ $a=-0.837111+0.699746I$ $b=-4.56897+3.50244I$	$-5.21373-0.70569I$	0
$u=\ \ 0.064515-1.103490I$ $a=-0.837111-0.699746I$ $b=-4.56897-3.50244I$	$-5.21373+0.70569I$	0
$u=-0.855068+0.256917I$ $a=-1.132500+0.650238I$ $b=\ \ 0.092057+1.325760I$	$0.36044+8.13712I$	$2.61173-7.81814I$
$u=-0.855068-0.256917I$ $a=-1.132500-0.650238I$ $b=\ \ 0.092057-1.325760I$	$0.36044-8.13712I$	$2.61173+7.81814I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.350317 + 1.060040I$ $a = 0.294171 + 0.799722I$ $b = -1.38699 + 1.41892I$	$-4.64726 + 0.57043I$	0
$u = 0.350317 - 1.060040I$ $a = 0.294171 - 0.799722I$ $b = -1.38699 - 1.41892I$	$-4.64726 - 0.57043I$	0
$u = 0.808095 + 0.314434I$ $a = 1.017030 + 0.892959I$ $b = 0.074269 + 0.903046I$	$0.08231 - 3.66290I$	$3.58979 + 1.40051I$
$u = 0.808095 - 0.314434I$ $a = 1.017030 - 0.892959I$ $b = 0.074269 - 0.903046I$	$0.08231 + 3.66290I$	$3.58979 - 1.40051I$
$u = -0.785972 + 0.826020I$ $a = 0.209581 - 1.078080I$ $b = -0.99508 - 1.03869I$	$1.60464 - 5.37316I$	0
$u = -0.785972 - 0.826020I$ $a = 0.209581 + 1.078080I$ $b = -0.99508 + 1.03869I$	$1.60464 + 5.37316I$	0
$u = 0.410177 + 1.065600I$ $a = -0.159381 + 0.423837I$ $b = -1.60715 + 1.91064I$	$-4.93281 + 1.58754I$	0
$u = 0.410177 - 1.065600I$ $a = -0.159381 - 0.423837I$ $b = -1.60715 - 1.91064I$	$-4.93281 - 1.58754I$	0
$u = -0.483561 + 1.036610I$ $a = 1.18463 + 2.48322I$ $b = 3.24923 + 1.43098I$	$-2.27217 - 3.12959I$	0
$u = -0.483561 - 1.036610I$ $a = 1.18463 - 2.48322I$ $b = 3.24923 - 1.43098I$	$-2.27217 + 3.12959I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.003226+1.159550I$ $a=\ \ 0.360311-0.536547I$ $b=-0.418853-0.128520I$	$-2.29574-1.43665I$	0
$u=-0.003226-1.159550I$ $a=\ \ 0.360311+0.536547I$ $b=-0.418853+0.128520I$	$-2.29574+1.43665I$	0
$u=\ \ 0.690646+0.474659I$ $a=-0.432606+0.962142I$ $b=-0.916049-0.123060I$	$-6.24124+3.82132I$	$-6.20968-8.07346I$
$u=\ \ 0.690646-0.474659I$ $a=-0.432606-0.962142I$ $b=-0.916049+0.123060I$	$-6.24124-3.82132I$	$-6.20968+8.07346I$
$u=-0.428801+1.080980I$ $a=-0.312278+0.887837I$ $b=\ \ 1.98200+2.21193I$	$-4.46894-4.49890I$	0
$u=-0.428801-1.080980I$ $a=-0.312278-0.887837I$ $b=\ \ 1.98200-2.21193I$	$-4.46894+4.49890I$	0
$u=\ \ 0.312579+1.137150I$ $a=\ \ 0.75573-2.74932I$ $b=\ \ 4.48388-3.25580I$	-6.34069	0
$u=\ \ 0.312579-1.137150I$ $a=\ \ 0.75573+2.74932I$ $b=\ \ 4.48388+3.25580I$	-6.34069	0
$u=-0.562810+1.043120I$ $a=\ \ 0.556473-0.818950I$ $b=-0.62933-1.44802I$	$0.08231-3.66290I$	0
$u=-0.562810-1.043120I$ $a=\ \ 0.556473+0.818950I$ $b=-0.62933+1.44802I$	$0.08231+3.66290I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.776911+0.203083I$ $a=1.109940+0.191140I$ $b=-0.409102+0.674856I$	$-4.33918+5.53805I$	$-3.90913-6.85663I$
$u=-0.776911-0.203083I$ $a=1.109940-0.191140I$ $b=-0.409102-0.674856I$	$-4.33918-5.53805I$	$-3.90913+6.85663I$
$u=0.487357+1.094930I$ $a=-0.247123+0.713016I$ $b=0.39100+1.54528I$	$-4.33918+5.53805I$	0
$u=0.487357-1.094930I$ $a=-0.247123-0.713016I$ $b=0.39100-1.54528I$	$-4.33918-5.53805I$	0
$u=-0.376610+1.148160I$ $a=-0.138160-0.597899I$ $b=0.70047-1.72101I$	$-8.54703-1.92366I$	0
$u=-0.376610-1.148160I$ $a=-0.138160+0.597899I$ $b=0.70047+1.72101I$	$-8.54703+1.92366I$	0
$u=0.249681+1.185590I$ $a=-0.604777+0.500748I$ $b=-0.992600-0.018721I$	$-4.64726-0.57043I$	0
$u=0.249681-1.185590I$ $a=-0.604777-0.500748I$ $b=-0.992600+0.018721I$	$-4.64726+0.57043I$	0
$u=0.725676+0.258615I$ $a=-3.83605+1.40458I$ $b=-1.267900-0.049606I$	$-2.27217-3.12959I$	$15.2117-9.6931I$
$u=0.725676-0.258615I$ $a=-3.83605-1.40458I$ $b=-1.267900+0.049606I$	$-2.27217+3.12959I$	$15.2117+9.6931I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.526926+1.115530I$ $a=\ \ 0.224956-1.260480I$ $b=-1.82173-2.23021I$	$-9.17741-9.99849I$	0
$u=-0.526926-1.115530I$ $a=\ \ 0.224956+1.260480I$ $b=-1.82173+2.23021I$	$-9.17741+9.99849I$	0
$u=\ \ 0.561316+1.103110I$ $a=-0.316268-0.887342I$ $b=\ \ 1.48519-1.97154I$	$0.36044+8.13712I$	0
$u=\ \ 0.561316-1.103110I$ $a=-0.316268+0.887342I$ $b=\ \ 1.48519+1.97154I$	$0.36044-8.13712I$	0
$u=-0.332047+1.197330I$ $a=-0.210447-0.558443I$ $b=-1.56775-2.42710I$	$-8.54703+1.92366I$	0
$u=-0.332047-1.197330I$ $a=-0.210447+0.558443I$ $b=-1.56775+2.42710I$	$-8.54703-1.92366I$	0
$u=\ \ 0.592012+1.131900I$ $a=\ \ 0.293407-0.411857I$ $b=\ \ 1.078880-0.241257I$	$-8.20023+1.30258I$	0
$u=\ \ 0.592012-1.131900I$ $a=\ \ 0.293407+0.411857I$ $b=\ \ 1.078880+0.241257I$	$-8.20023-1.30258I$	0
$u=-0.276176+1.249140I$ $a=\ \ 0.687575+0.509103I$ $b=-0.180816+0.280837I$	$-4.46894+4.49890I$	0
$u=-0.276176-1.249140I$ $a=\ \ 0.687575-0.509103I$ $b=-0.180816-0.280837I$	$-4.46894-4.49890I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.651322+0.305211I$ $a=1.92823-0.30964I$ $b=0.194539-1.371550I$	$-6.83660+5.39109I$	$-2.16171-3.24475I$
$u=-0.651322-0.305211I$ $a=1.92823+0.30964I$ $b=0.194539+1.371550I$	$-6.83660-5.39109I$	$-2.16171+3.24475I$
$u=0.193146+1.277710I$ $a=-0.738960+0.797259I$ $b=-0.481291+0.613476I$	$-6.83660-5.39109I$	0
$u=0.193146-1.277710I$ $a=-0.738960-0.797259I$ $b=-0.481291-0.613476I$	$-6.83660+5.39109I$	0
$u=-0.672119+0.169109I$ $a=0.724846+0.176406I$ $b=-0.697933-0.732080I$	$-4.93281+1.58754I$	$-5.30506-0.71829I$
$u=-0.672119-0.169109I$ $a=0.724846-0.176406I$ $b=-0.697933+0.732080I$	$-4.93281-1.58754I$	$-5.30506+0.71829I$
$u=0.607355+0.327938I$ $a=1.87061-1.49459I$ $b=0.727822-0.468850I$	$-1.28254-2.04071I$	$0.19519+5.50278I$
$u=0.607355-0.327938I$ $a=1.87061+1.49459I$ $b=0.727822+0.468850I$	$-1.28254+2.04071I$	$0.19519-5.50278I$
$u=0.597296+1.171100I$ $a=0.230966+1.257840I$ $b=-1.45496+2.23693I$	$-4.0673+14.2581I$	0
$u=0.597296-1.171100I$ $a=0.230966-1.257840I$ $b=-1.45496-2.23693I$	$-4.0673-14.2581I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.598585+1.215200I$ $a=\ 0.074645+0.441170I$ $b=\ 0.786868+0.767933I$	$-2.99088-5.96215I$	0
$u=-0.598585-1.215200I$ $a=\ 0.074645-0.441170I$ $b=\ 0.786868-0.767933I$	$-2.99088+5.96215I$	0
$u=-0.124316+1.349810I$ $a=-0.286192+0.586042I$ $b=-0.299789+0.434089I$	$-6.24124-3.82132I$	0
$u=-0.124316-1.349810I$ $a=-0.286192-0.586042I$ $b=-0.299789-0.434089I$	$-6.24124+3.82132I$	0
$u=-0.306030+1.331880I$ $a=-0.863629-0.768297I$ $b=-0.541990-0.646446I$	$-9.17741+9.99849I$	0
$u=-0.306030-1.331880I$ $a=-0.863629+0.768297I$ $b=-0.541990+0.646446I$	$-9.17741-9.99849I$	0
$u=-0.094582+0.608934I$ $a=-0.827391-0.891283I$ $b=\ 0.95905+1.87981I$	$-2.29574+1.43665I$	$4.46376-2.78521I$
$u=-0.094582-0.608934I$ $a=-0.827391+0.891283I$ $b=\ 0.95905-1.87981I$	$-2.29574-1.43665I$	$4.46376+2.78521I$
$u=\ 0.31537+1.38799I$ $a=\ 0.039125-0.452126I$ $b=-0.127553-0.386108I$	$-8.20023-1.30258I$	0
$u=\ 0.31537-1.38799I$ $a=\ 0.039125+0.452126I$ $b=-0.127553+0.386108I$	$-8.20023+1.30258I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.410127+0.241813I$		
$a=-1.21040-1.88967I$	$-1.82452-1.30012I$	$0.27514+4.02639I$
$b=\ \ 0.050254-1.101790I$		
$u=-0.410127-0.241813I$		
$a=-1.21040+1.88967I$	$-1.82452+1.30012I$	$0.27514-4.02639I$
$b=\ \ 0.050254+1.101790I$		

III.

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

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

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

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

$$a_5 = \begin{pmatrix} a^2u \\ a^4u - a^4 + 2a^2u - a^2 - au + a + 2u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -a^4u \\ 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -a^4 + u \\ -u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -a^4 \\ -a^4 - 2a^2 - u - 2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -a^4 \\ -u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4a^3 - 4a^2 - 4a - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = 0.339110 + 0.822375I$ $b = -1.09217 - 0.97690I$	$-3.61897 + 1.53058I$	$-4.51511 - 4.43065I$
$u = 1.000000I$ $a = 0.339110 - 0.822375I$ $b = 0.00765 - 1.64293I$	$-3.61897 - 1.53058I$	$-4.51511 + 4.43065I$
$u = 1.000000I$ $a = -0.766826$ $b = -4.28864 - 2.21774I$	-5.69095	-5.48110
$u = 1.000000I$ $a = -0.455697 + 1.200150I$ $b = -0.532590 + 1.109860I$	$-9.16243 - 4.40083I$	$-8.74431 + 3.49859I$
$u = 1.000000I$ $a = -0.455697 - 1.200150I$ $b = -0.094259 - 0.272297I$	$-9.16243 + 4.40083I$	$-8.74431 - 3.49859I$
$u = -1.000000I$ $a = 0.339110 + 0.822375I$ $b = 0.00765 + 1.64293I$	$-3.61897 + 1.53058I$	$-4.51511 - 4.43065I$
$u = -1.000000I$ $a = 0.339110 - 0.822375I$ $b = -1.09217 + 0.97690I$	$-3.61897 - 1.53058I$	$-4.51511 + 4.43065I$
$u = -1.000000I$ $a = -0.766826$ $b = -4.28864 + 2.21774I$	-5.69095	-5.48110
$u = -1.000000I$ $a = -0.455697 + 1.200150I$ $b = -0.094259 + 0.272297I$	$-9.16243 - 4.40083I$	$-8.74431 + 3.49859I$
$u = -1.000000I$ $a = -0.455697 - 1.200150I$ $b = -0.532590 - 1.109860I$	$-9.16243 + 4.40083I$	$-8.74431 - 3.49859I$

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

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ -2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 2 \\ 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.5 \\ 0.25 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.5 \\ 0.25 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.25 \\ -1.125 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 2.5 \\ 3.25 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -2 \\ -3 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -14.0625$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = \quad 0.500000$ $b = \quad 0.250000$	0	-14.0620

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^{10})(u+1)(u^{53}+23u^{52}+\cdots-11u-1)$ $\cdot(u^{82}+47u^{81}+\cdots+1760u+289)$
c_2, c_3	$(u+1)(u^2+1)^5(u^{53}-u^{52}+\cdots-u-1)(u^{82}-u^{81}+\cdots-80u+17)$
c_4	$4(2u-1)(u^{10}+5u^8+\cdots-u^2+1)(u^{41}-u^{40}+\cdots+289u+77)^2$ $\cdot(2u^{53}+7u^{52}+\cdots-449u-106)$
c_5	$4(2u-1)(u^{10}-3u^8+\cdots-u^2+1)(u^{41}-3u^{40}+\cdots-129u+31)^2$ $\cdot(2u^{53}+19u^{52}+\cdots-27u-22)$
c_6, c_7	$(u-1)(u^2+1)^5(u^{53}-u^{52}+\cdots-u-1)(u^{82}-u^{81}+\cdots-80u+17)$
c_8	$(u-1)(u+1)^{10}(u^{53}+23u^{52}+\cdots-11u-1)$ $\cdot(u^{82}+47u^{81}+\cdots+1760u+289)$
c_9	$(u-1)(u^5+u^4+\cdots+u-1)^2(u^{41}-u^{40}+\cdots+7u+1)^2$ $\cdot(u^{53}-2u^{52}+\cdots+145u-16)$
c_{10}	$u(u^5-u^4+\cdots+u-1)^2(u^{41}+7u^{40}+\cdots-u-1)^2$ $\cdot(u^{53}+9u^{52}+\cdots+44u-32)$
c_{11}	$(u+1)(u^5-u^4+\cdots+u+1)^2(u^{41}-u^{40}+\cdots+7u+1)^2$ $\cdot(u^{53}-2u^{52}+\cdots+145u-16)$
c_{12}	$(u+2)(u^{10}+u^8+\cdots+3u^2+1)(u^{41}+3u^{40}+\cdots+u+1)^2$ $\cdot(u^{53}-11u^{52}+\cdots+12u-4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_8	$((y-1)^{11})(y^{53}+19y^{52}+\cdots+17y-1)$ $\cdot(y^{82}-25y^{81}+\cdots+237460y+83521)$
c_2, c_3, c_6 c_7	$(y-1)(y+1)^{10}(y^{53}+23y^{52}+\cdots-11y-1)$ $\cdot(y^{82}+47y^{81}+\cdots+1760y+289)$
c_4	$16(4y-1)(y^5+5y^4+8y^3+3y^2-y+1)^2$ $\cdot(y^{41}-25y^{40}+\cdots-76331y-5929)^2$ $\cdot(4y^{53}-109y^{52}+\cdots+600797y-11236)$
c_5	$16(4y-1)(y^5-3y^4+4y^3-y^2-y+1)^2$ $\cdot(y^{41}-45y^{40}+\cdots+24081y-961)^2$ $\cdot(4y^{53}-253y^{52}+\cdots-47627y-484)$
c_9, c_{11}	$(y-1)(y^5-5y^4+\cdots-y-1)^2(y^{41}-29y^{40}+\cdots-7y-1)^2$ $\cdot(y^{53}-40y^{52}+\cdots+9057y-256)$
c_{10}	$y(y^5+3y^4+\cdots-y-1)^2(y^{41}+3y^{40}+\cdots-7y-1)^2$ $\cdot(y^{53}+9y^{52}+\cdots-3504y-1024)$
c_{12}	$(y-4)(y^5+y^4+\cdots+3y+1)^2(y^{41}+7y^{40}+\cdots-3y-1)^2$ $\cdot(y^{53}+5y^{52}+\cdots-40y-16)$