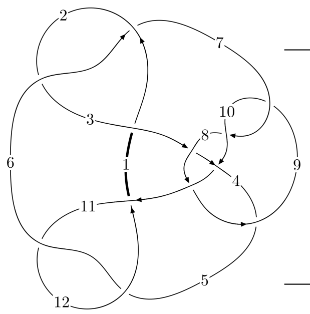
$12n_{0365}$ ($K12n_{0365}$)



A knot diagram[1]

Linearized knot diagam

$$\begin{array}{cccccccccccccccccccccccccc} \to & \downarrow & \to & \uparrow & \to & \downarrow & \to & \uparrow & \to & \downarrow & \to & \uparrow & \to & \uparrow & \to & \downarrow & \to & \uparrow & \to & \uparrow & \to & \downarrow & \to & \uparrow & \to \\ & 3 & & 6 & & 8 & & 9 & & 12 & & 2 & & 10 & & 11 & & 7 & & 4 & & 6 & & 11 & \end{array}$$

Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & 2.02561 \times 10^{72} u^{49} + 2.96495 \times 10^{72} u^{48} + \cdots + 1.21339 \times 10^{74} b - 2.39856 \times 10^{74}, \\
& -7.63466 \times 10^{75} u^{49} - 1.40414 \times 10^{76} u^{48} + \cdots + 3.30041 \times 10^{76} a - 7.69213 \times 10^{76}, \\
& u^{50} + 2u^{49} + \cdots + 152u + 17 \rangle \\
I_2^u = \langle & -13362a^5u + 25075a^4u + \cdots - 39143a - 74777, \\
& a^6 - 5a^5u - 5a^5 + 14a^4u + 2a^3u + 9a^3 - 14a^2u + 10a^2 - 5au - 13a + 3u,\ u^2 + 1 \rangle \\
I_3^u = \langle & 6u^{12} + 24u^{10} - 3u^9 + 36u^8 - 9u^7 + 62u^6 - 9u^5 + 82u^4 - 42u^3 + 38u^2 + 29b - 39u + 4, \\
& -4u^{13} + 22u^{12} + \cdots + 29a + 92, \\
& u^{15} + 5u^{13} + u^{12} + 10u^{11} + 4u^{10} + 18u^9 + 6u^8 + 29u^7 + 7u^6 + 25u^5 + 7u^4 + 11u^3 + 3u^2 + 3u + 1 \rangle \\
I_4^u = \langle & b,\ 5u^3 + 6u^2 + 4a + 3u - 5,\ u^4 + u^3 + u^2 + 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 81 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. $\boldsymbol{I^u_1 = \langle 2.03 \times 10^{72} u^{49} + 2.96 \times 10^{72} u^{48} + \cdots + 1.21 \times 10^{74} b - 2.40 \times 10^{74},\ -7.63 \times 10^{75} u^{49} - 1.40 \times 10^{76} u^{48} + \cdots + 3.30 \times 10^{76} a - 7.69 \times 10^{76},\ u^{50} + 2u^{49} + \cdots + 152u + 17 \rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.231325u^{49} + 0.425444u^{48} + \cdots - 33.6337u + 2.33066 \\ -0.0166939u^{49} - 0.0244354u^{48} + \cdots + 14.1364u + 1.97675 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.0189248u^{49} + 0.0297277u^{48} + \cdots + 16.3779u - 0.398814 \\ 0.0435990u^{49} + 0.0673620u^{48} + \cdots - 25.3529u - 1.26192 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.214631u^{49} + 0.401008u^{48} + \cdots - 19.4973u + 4.30741 \\ -0.0166939u^{49} - 0.0244354u^{48} + \cdots + 14.1364u + 1.97675 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.0365406u^{49} + 0.122206u^{48} + \cdots + 121.471u + 14.8982 \\ 0.0672711u^{49} + 0.136915u^{48} + \cdots - 14.6720u - 0.629900 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 0.0365406u^{49} + 0.122206u^{48} + \cdots + 121.471u + 14.8982 \\ 0.0957047u^{49} + 0.192077u^{48} + \cdots - 22.7602u - 1.46502 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.000887389u^{49} + 0.0626165u^{48} + \cdots + 29.6760u - 5.39473 \\ -0.0484569u^{49} - 0.138861u^{48} + \cdots - 24.3562u - 1.00579 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.00969873u^{49} - 0.00903617u^{48} + \cdots + 8.95010u + 9.56237 \\ 0.0484569u^{49} + 0.138861u^{48} + \cdots + 24.3562u + 1.00579 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.0855761u^{49} + 0.331954u^{48} + \cdots + 149.998u + 4.43588$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{50} + 14u^{49} + \cdots + 5136u + 289$
c_2, c_6	$u^{50} - 2u^{49} + \cdots - 44u + 17$
c_3	$2(2u^{50} + 3u^{49} + \cdots + 2699u + 3982)$
c_4	$2(2u^{50} - 5u^{49} + \cdots - 2584919u + 1407026)$
c_5, c_{11}	$u^{50} - 2u^{49} + \cdots - 152u + 17$
c_7, c_9	$u^{50} + 4u^{49} + \cdots - 127u + 16$
c_8	$u^{50} - 8u^{49} + \cdots + 2976u + 256$
c_{10}	$u^{50} + 7u^{49} + \cdots + 8u + 4$
c_{12}	$u^{50} - 62u^{49} + \cdots + 11952u + 289$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{50} + 58y^{49} + \cdots + 8224052y + 83521$
c_2, c_6	$y^{50} + 14y^{49} + \cdots + 5136y + 289$
c_3	$4(4y^{50} + 275y^{49} + \cdots + 6.39567 \times 10^{8}y + 1.58563 \times 10^{7})$
c_4	$4(4y^{50} + 115y^{49} + \cdots + 2.59259 \times 10^{12}y + 1.97972 \times 10^{12})$
c_5, c_{11}	$y^{50} + 62y^{49} + \cdots - 11952y + 289$
c_7, c_9	$y^{50} - 40y^{49} + \cdots + 17759y + 256$
c_8	$y^{50} + 12y^{49} + \cdots - 1020928y + 65536$
c_{10}	$y^{50} + y^{49} + \cdots + 152y + 16$
c_{12}	$y^{50} - 134y^{49} + \cdots - 132056732y + 83521$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.737879 + 0.542454I$ $a = 0.847801 + 0.207388I$ $b = 0.83688 - 1.30980I$	$-0.03524 + 5.80828I$	$1.80389 - 9.34928I$
$u = -0.737879 - 0.542454I$ $a = 0.847801 - 0.207388I$ $b = 0.83688 + 1.30980I$	$-0.03524 - 5.80828I$	$1.80389 + 9.34928I$
$u = -0.564218 + 0.713559I$ $a = -0.596450 - 0.497655I$ $b = -1.25745 - 0.91387I$	$3.72647 + 3.16916I$	$9.86538 - 6.96751I$
$u = -0.564218 - 0.713559I$ $a = -0.596450 + 0.497655I$ $b = -1.25745 + 0.91387I$	$3.72647 - 3.16916I$	$9.86538 + 6.96751I$
$u = -0.322007 + 0.809098I$ $a = -1.58082 - 1.08895I$ $b = -0.855653 + 0.987594I$	$3.45702 - 0.25001I$	$11.35059 + 0.24450I$
$u = -0.322007 - 0.809098I$ $a = -1.58082 + 1.08895I$ $b = -0.855653 - 0.987594I$	$3.45702 + 0.25001I$	$11.35059 - 0.24450I$
$u = 0.092893 + 1.142970I$ $a = -0.576109 + 0.096453I$ $b = 1.149680 + 0.120400I$	$-0.168989 - 0.748778I$	0
$u = 0.092893 - 1.142970I$ $a = -0.576109 - 0.096453I$ $b = 1.149680 - 0.120400I$	$-0.168989 + 0.748778I$	0
$u = -0.015230 + 1.167690I$ $a = 0.345425 + 0.285302I$ $b = -1.194380 - 0.508201I$	$1.33404 - 5.95631I$	0
$u = -0.015230 - 1.167690I$ $a = 0.345425 - 0.285302I$ $b = -1.194380 + 0.508201I$	$1.33404 + 5.95631I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.058630 + 0.564153I$ $a = -0.684944 - 0.418407I$ $b = -0.89846 + 1.26634I$	$5.33295 + 11.18530I$	0
$u = -1.058630 - 0.564153I$ $a = -0.684944 + 0.418407I$ $b = -0.89846 - 1.26634I$	$5.33295 - 11.18530I$	0
$u = -0.810193 + 0.953463I$ $a = -0.207250 + 0.038953I$ $b = 0.336796 + 0.195309I$	$-5.21341 + 3.02399I$	0
$u = -0.810193 - 0.953463I$ $a = -0.207250 - 0.038953I$ $b = 0.336796 - 0.195309I$	$-5.21341 - 3.02399I$	0
$u = 0.572505 + 0.477849I$ $a = -1.106810 + 0.202089I$ $b = -0.158097 - 0.480865I$	$-0.01643 - 1.94498I$	$0.87974 + 3.02972I$
$u = 0.572505 - 0.477849I$ $a = -1.106810 - 0.202089I$ $b = -0.158097 + 0.480865I$	$-0.01643 + 1.94498I$	$0.87974 - 3.02972I$
$u = 1.151410 + 0.518515I$ $a = 0.369015 - 0.029245I$ $b = 0.089569 + 1.060610I$	$4.77019 - 2.61015I$	0
$u = 1.151410 - 0.518515I$ $a = 0.369015 + 0.029245I$ $b = 0.089569 - 1.060610I$	$4.77019 + 2.61015I$	0
$u = 0.226062 + 0.681121I$ $a = -0.697975 - 0.069523I$ $b = 0.239643 + 0.306301I$	$0.235392 - 1.266680I$	$2.17934 + 5.51042I$
$u = 0.226062 - 0.681121I$ $a = -0.697975 + 0.069523I$ $b = 0.239643 - 0.306301I$	$0.235392 + 1.266680I$	$2.17934 - 5.51042I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.409078 + 0.579666I$ $a = 5.55951 + 0.41408I$ $b = 0.290024 - 0.026703I$	$1.64557 - 1.46182I$	$-49.4938 - 3.8392I$
$u = 0.409078 - 0.579666I$ $a = 5.55951 - 0.41408I$ $b = 0.290024 + 0.026703I$	$1.64557 + 1.46182I$	$-49.4938 + 3.8392I$
$u = 0.20565 + 1.55151I$ $a = -0.362040 + 1.161030I$ $b = -0.507417 - 0.813843I$	$6.75526 - 4.85770I$	0
$u = 0.20565 - 1.55151I$ $a = -0.362040 - 1.161030I$ $b = -0.507417 + 0.813843I$	$6.75526 + 4.85770I$	0
$u = 0.01105 + 1.56936I$ $a = -0.251681 - 1.361360I$ $b = -0.187772 + 0.921101I$	$7.51460 - 1.56660I$	0
$u = 0.01105 - 1.56936I$ $a = -0.251681 + 1.361360I$ $b = -0.187772 - 0.921101I$	$7.51460 + 1.56660I$	0
$u = 0.175122 + 0.353457I$ $a = 1.98065 - 0.03015I$ $b = -0.960838 + 0.591042I$	$-1.43606 + 5.46886I$	$-3.64987 - 5.42308I$
$u = 0.175122 - 0.353457I$ $a = 1.98065 + 0.03015I$ $b = -0.960838 - 0.591042I$	$-1.43606 - 5.46886I$	$-3.64987 + 5.42308I$
$u = 0.146248 + 0.365089I$ $a = -2.47915 + 0.61555I$ $b = -0.095714 + 0.666726I$	$0.522597 - 1.281740I$	$1.45542 + 3.17634I$
$u = 0.146248 - 0.365089I$ $a = -2.47915 - 0.61555I$ $b = -0.095714 - 0.666726I$	$0.522597 + 1.281740I$	$1.45542 - 3.17634I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.11367 + 1.60575I$ $a = 0.943103 + 0.333746I$ $b = 0.806454 - 0.159713I$	$9.24524 - 3.37020I$	0
$u = 0.11367 - 1.60575I$ $a = 0.943103 - 0.333746I$ $b = 0.806454 + 0.159713I$	$9.24524 + 3.37020I$	0
$u = -0.25701 + 1.59600I$ $a = -0.06456 + 1.72172I$ $b = 1.33521 - 1.66319I$	$7.12550 + 9.55838I$	0
$u = -0.25701 - 1.59600I$ $a = -0.06456 - 1.72172I$ $b = 1.33521 + 1.66319I$	$7.12550 - 9.55838I$	0
$u = 0.05105 + 1.62454I$ $a = -0.41171 - 1.62511I$ $b = 0.91099 + 1.89793I$	$8.27324 - 2.71933I$	0
$u = 0.05105 - 1.62454I$ $a = -0.41171 + 1.62511I$ $b = 0.91099 - 1.89793I$	$8.27324 + 2.71933I$	0
$u = -0.39919 + 1.61362I$ $a = -0.21831 - 1.56417I$ $b = -1.22043 + 1.35112I$	$12.3391 + 16.5813I$	0
$u = -0.39919 - 1.61362I$ $a = -0.21831 + 1.56417I$ $b = -1.22043 - 1.35112I$	$12.3391 - 16.5813I$	0
$u = -0.16465 + 1.65456I$ $a = 0.967449 + 1.029180I$ $b = -1.61238 - 1.73076I$	$11.93760 + 5.99162I$	0
$u = -0.16465 - 1.65456I$ $a = 0.967449 - 1.029180I$ $b = -1.61238 + 1.73076I$	$11.93760 - 5.99162I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.06703 + 1.66709I$ $a = 0.677409 - 1.225970I$ $b = -1.96655 + 1.31397I$	$12.29170 + 1.16111I$	0
$u = -0.06703 - 1.66709I$ $a = 0.677409 + 1.225970I$ $b = -1.96655 - 1.31397I$	$12.29170 - 1.16111I$	0
$u = 0.43153 + 1.63520I$ $a = 0.267401 - 1.041780I$ $b = 0.639430 + 1.133170I$	$11.7068 - 8.4623I$	0
$u = 0.43153 - 1.63520I$ $a = 0.267401 + 1.041780I$ $b = 0.639430 - 1.133170I$	$11.7068 + 8.4623I$	0
$u = 0.26322 + 1.72469I$ $a = 0.021610 + 1.410470I$ $b = -0.98522 - 1.50703I$	$14.6583 - 9.1791I$	0
$u = 0.26322 - 1.72469I$ $a = 0.021610 - 1.410470I$ $b = -0.98522 + 1.50703I$	$14.6583 + 9.1791I$	0
$u = -0.30773 + 1.74544I$ $a = 0.296716 + 1.004440I$ $b = 0.262227 - 1.380400I$	$14.2488 + 0.8615I$	0
$u = -0.30773 - 1.74544I$ $a = 0.296716 - 1.004440I$ $b = 0.262227 + 1.380400I$	$14.2488 - 0.8615I$	0
$u = -0.145721 + 0.042290I$ $a = 1.42495 + 6.29903I$ $b = 1.003440 - 0.398879I$	$-3.59031 + 0.96879I$	$-7.50173 - 1.09095I$
$u = -0.145721 - 0.042290I$ $a = 1.42495 - 6.29903I$ $b = 1.003440 + 0.398879I$	$-3.59031 - 0.96879I$	$-7.50173 + 1.09095I$

II. $\boldsymbol{I_2^u = \langle -1.34 \times 10^4 a^5 u + 2.51 \times 10^4 a^4 u + \cdots - 3.91 \times 10^4 a - 7.48 \times 10^4,\ -5a^5 u + 14a^4 u + \cdots + 10a^2 - 13a,\ u^2 + 1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a \\ 0.500206a^5u - 0.938682a^4u + \cdots + 1.46532a + 2.79927 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.306255a^5u + 1.70067a^4u + \cdots - 3.13716a - 0.883390 \\ 0.158387a^5u - 0.374836a^4u + \cdots + 0.955303a + 1.85951 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.500206a^5u - 0.938682a^4u + \cdots + 2.46532a + 2.79927 \\ 0.500206a^5u - 0.938682a^4u + \cdots + 1.46532a + 2.79927 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 0.527009a^5u - 2.31977a^4u + \cdots + 5.04107a + 2.85019 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ 0.527009a^5u - 2.31977a^4u + \cdots + 5.04107a + 1.85019 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.144312a^5u - 0.160484a^4u + \cdots - 0.144574a - 1.21825 \\ 0.00812339a^5u + 2.51020a^4u + \cdots - 5.64115a + 2.53498 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ 0.00812339a^5u + 2.51020a^4u + \cdots - 5.64115a + 2.53498 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{45304}{26713}a^5u - \frac{242984}{26713}a^4u + \cdots + \frac{450232}{26713}a + \frac{98588}{26713}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = -0.973865 - 0.455201I$ $b = 1.073950 + 0.558752I$	$-5.69302I$	$2.00000 + 5.51057I$
$u = 1.000000I$ $a = -0.008563 + 0.670038I$ $b = -1.002190 + 0.295542I$	$-1.89061 + 0.92430I$	$-1.71672 - 0.79423I$
$u = 1.000000I$ $a = 1.320500 + 0.473476I$ $b = -1.002190 - 0.295542I$	$-1.89061 - 0.92430I$	$-1.71672 + 0.79423I$
$u = 1.000000I$ $a = 0.143638 + 0.307302I$ $b = 1.073950 - 0.558752I$	$5.69302I$	$2.00000 - 5.51057I$
$u = 1.000000I$ $a = 1.96360 + 0.56994I$ $b = 0.428243 + 0.664531I$	$1.89061 + 0.92430I$	$5.71672 - 0.79423I$
$u = 1.000000I$ $a = 2.55469 + 3.43444I$ $b = 0.428243 - 0.664531I$	$1.89061 - 0.92430I$	$5.71672 + 0.79423I$
$u = -1.000000I$ $a = -0.973865 + 0.455201I$ $b = 1.073950 - 0.558752I$	$5.69302I$	$2.00000 - 5.51057I$
$u = -1.000000I$ $a = -0.008563 - 0.670038I$ $b = -1.002190 - 0.295542I$	$-1.89061 - 0.92430I$	$-1.71672 + 0.79423I$
$u = -1.000000I$ $a = 1.320500 - 0.473476I$ $b = -1.002190 + 0.295542I$	$-1.89061 + 0.92430I$	$-1.71672 - 0.79423I$
$u = -1.000000I$ $a = 0.143638 - 0.307302I$ $b = 1.073950 + 0.558752I$	$-5.69302I$	$2.00000 + 5.51057I$

	Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=$	$-1.000000I$		
$a=$	$1.96360-0.56994I$	$1.89061-0.92430I$	$5.71672+0.79423I$
$b=$	$0.428243-0.664531I$		
$u=$	$-1.000000I$		
$a=$	$2.55469-3.43444I$	$1.89061+0.92430I$	$5.71672-0.79423I$
$b=$	$0.428243+0.664531I$		

III. $\boldsymbol{I_3^u = \langle 6u^{12} + 24u^{10} + \cdots + 29b + 4,\ -4u^{13} + 22u^{12} + \cdots + 29a + 92,\ u^{15} + 5u^{13} + \cdots + 3u + 1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.137931u^{13} - 0.758621u^{12} + \cdots + 0.689655u - 3.17241 \\ -0.206897u^{12} - 0.827586u^{10} + \cdots + 1.34483u - 0.137931 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.586207u^{13} + 0.965517u^{12} + \cdots - u + 3.31034 \\ 0.379310u^{12} + 1.51724u^{10} + \cdots + 1.03448u + 0.586207 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.137931u^{13} - 0.965517u^{12} + \cdots + 2.03448u - 3.31034 \\ -0.206897u^{12} - 0.827586u^{10} + \cdots + 1.34483u - 0.137931 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.758621u^{12} + 3.03448u^{10} + \cdots + 0.0689655u + 3.17241 \\ -u^3 - u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{28}{29}u^{12} + \frac{112}{29}u^{10} + \frac{44}{29}u^9 + \frac{168}{29}u^8 + \frac{132}{29}u^7 + \frac{328}{29}u^6 + \frac{132}{29}u^5 + \frac{460}{29}u^4 + \frac{268}{29}u^3 + \frac{216}{29}u^2 + \frac{224}{29}u + \frac{154}{29}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{15}+10u^{14}+\cdots+3u-1$
c_2,c_5,c_6 c_{11}	$u^{15}+5u^{13}+\cdots+3u-1$
c_3,c_8	$(u^5-u^4+2u^3-u^2+u-1)^3$
c_4,c_7,c_9	$(u^5+u^4-2u^3-u^2+u-1)^3$
c_{10}	$(u^5-3u^4+4u^3-u^2-u+1)^3$
c_{12}	$u^{15}-10u^{14}+\cdots+3u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{12}	$y^{15} - 10y^{14} + \cdots + 95y - 1$
c_2, c_5, c_6 c_{11}	$y^{15} + 10y^{14} + \cdots + 3y - 1$
c_3, c_8	$(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)^3$
c_4, c_7, c_9	$(y^5 - 5y^4 + 8y^3 - 3y^2 - y - 1)^3$
c_{10}	$(y^5 - y^4 + 8y^3 - 3y^2 + 3y - 1)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.157313 + 1.036460I$ $a = -3.17294 + 2.29859I$ $b = -0.766826$	2.40108	$3.48114 + 0.I$
$u = 0.157313 - 1.036460I$ $a = -3.17294 - 2.29859I$ $b = -0.766826$	2.40108	$3.48114 + 0.I$
$u = 0.001127 + 1.228660I$ $a = -1.55554 + 2.09943I$ $b = 0.339110 - 0.822375I$	$0.32910 + 1.53058I$	$2.51511 - 4.43065I$
$u = 0.001127 - 1.228660I$ $a = -1.55554 - 2.09943I$ $b = 0.339110 + 0.822375I$	$0.32910 - 1.53058I$	$2.51511 + 4.43065I$
$u = -1.021430 + 0.758717I$ $a = 0.403745 - 0.032528I$ $b = -0.455697 - 1.200150I$	$5.87256 - 4.40083I$	$6.74431 + 3.49859I$
$u = -1.021430 - 0.758717I$ $a = 0.403745 + 0.032528I$ $b = -0.455697 + 1.200150I$	$5.87256 + 4.40083I$	$6.74431 - 3.49859I$
$u = 0.363053 + 0.617188I$ $a = -0.0663988 + 0.1194530I$ $b = 0.339110 + 0.822375I$	$0.32910 - 1.53058I$	$2.51511 + 4.43065I$
$u = 0.363053 - 0.617188I$ $a = -0.0663988 - 0.1194530I$ $b = 0.339110 - 0.822375I$	$0.32910 + 1.53058I$	$2.51511 - 4.43065I$
$u = -0.364180 + 0.611475I$ $a = -1.022160 + 0.511883I$ $b = 0.339110 + 0.822375I$	$0.32910 - 1.53058I$	$2.51511 + 4.43065I$
$u = -0.364180 - 0.611475I$ $a = -1.022160 - 0.511883I$ $b = 0.339110 - 0.822375I$	$0.32910 + 1.53058I$	$2.51511 - 4.43065I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.975116 + 0.872207I$ $a = -0.457247 + 0.357517I$ $b = -0.455697 - 1.200150I$	$5.87256 - 4.40083I$	$6.74431 + 3.49859I$
$u = 0.975116 - 0.872207I$ $a = -0.457247 - 0.357517I$ $b = -0.455697 + 1.200150I$	$5.87256 + 4.40083I$	$6.74431 - 3.49859I$
$u = 0.04631 + 1.63092I$ $a = 0.480320 - 1.202230I$ $b = -0.455697 + 1.200150I$	$5.87256 + 4.40083I$	$6.74431 - 3.49859I$
$u = 0.04631 - 1.63092I$ $a = 0.480320 + 1.202230I$ $b = -0.455697 - 1.200150I$	$5.87256 - 4.40083I$	$6.74431 + 3.49859I$
$u = -0.314625$ $a = -4.21957$ $b = -0.766826$	2.40108	3.48110

IV. $I_4^u = \langle b,\ 5u^3 + 6u^2 + 4a + 3u - 5,\ u^4 + u^3 + u^2 + 1\rangle$

(i) Arc colorings

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

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

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

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

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

$$a_9 = \begin{pmatrix} -\frac{5}{4}u^3 - \frac{3}{2}u^2 - \frac{3}{4}u + \frac{5}{4} \\ 0 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{8}u^3 - \frac{7}{4}u^2 - \frac{15}{8}u - \frac{19}{8} \\ u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{5}{4}u^3 - \frac{3}{2}u^2 - \frac{3}{4}u + \frac{5}{4} \\ 0 \end{pmatrix}$$

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{71}{16}u^3 + \frac{71}{8}u^2 - \frac{113}{16}u + \frac{211}{16}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^4 - 11y^3 + 31y^2 + 10y + 1$
c_2, c_6, c_{12}	$y^4 + 5y^3 + 7y^2 + 2y + 1$
c_3, c_4	$4(4y^4 + 19y^3 + 31y^2 + 9y + 1)$
c_5, c_{11}	$y^4 + y^3 + 3y^2 + 2y + 1$
c_7, c_9	$(y-1)^4$
c_8	y^4
c_{10}	$y^4 + 9y^3 + 31y^2 + 19y + 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.351808 + 0.720342I$ $a = 2.20896 - 1.16763I$ $b = 0$	$1.85594 - 1.41510I$	$9.43312 - 0.11741I$
$u = 0.351808 - 0.720342I$ $a = 2.20896 + 1.16763I$ $b = 0$	$1.85594 + 1.41510I$	$9.43312 + 0.11741I$
$u = -0.851808 + 0.911292I$ $a = 0.166035 + 0.111704I$ $b = 0$	$-5.14581 + 3.16396I$	$11.5981 - 25.6585I$
$u = -0.851808 - 0.911292I$ $a = 0.166035 - 0.111704I$ $b = 0$	$-5.14581 - 3.16396I$	$11.5981 + 25.6585I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^{12})(u^4-5u^3+\cdots-2u+1)(u^{15}+10u^{14}+\cdots+3u-1)$ $\cdot(u^{50}+14u^{49}+\cdots+5136u+289)$
c_2	$((u^2+1)^6)(u^4+u^3+3u^2+2u+1)(u^{15}+5u^{13}+\cdots+3u-1)$ $\cdot(u^{50}-2u^{49}+\cdots-44u+17)$
c_3	$4(2u^4+u^3+5u^2-u+1)(u^5-u^4+2u^3-u^2+u-1)^3$ $\cdot(u^{12}-u^{10}+5u^8+6u^4-3u^2+1)(2u^{50}+3u^{49}+\cdots+2699u+3982)$
c_4	$4(2u^4+u^3+5u^2-u+1)(u^5+u^4-2u^3-u^2+u-1)^3$ $\cdot(u^{12}+3u^{10}+5u^8+4u^6+2u^4+u^2+1)$ $\cdot(2u^{50}-5u^{49}+\cdots-2584919u+1407026)$
c_5	$((u^2+1)^6)(u^4-u^3+u^2+1)(u^{15}+5u^{13}+\cdots+3u-1)$ $\cdot(u^{50}-2u^{49}+\cdots-152u+17)$
c_6	$((u^2+1)^6)(u^4-u^3+3u^2-2u+1)(u^{15}+5u^{13}+\cdots+3u-1)$ $\cdot(u^{50}-2u^{49}+\cdots-44u+17)$
c_7	$(u+1)^4(u^5+u^4-2u^3-u^2+u-1)^3(u^6-u^5-u^4+2u^3-u+1)^2$ $\cdot(u^{50}+4u^{49}+\cdots-127u+16)$
c_8	$u^4(u^5-u^4+2u^3-u^2+u-1)^3(u^6+u^5-u^4-2u^3+u+1)^2$ $\cdot(u^{50}-8u^{49}+\cdots+2976u+256)$
c_9	$(u-1)^4(u^5+u^4-2u^3-u^2+u-1)^3(u^6+u^5-u^4-2u^3+u+1)^2$ $\cdot(u^{50}+4u^{49}+\cdots-127u+16)$
c_{10}	$(u^4-u^3+5u^2+u+2)(u^5-3u^4+4u^3-u^2-u+1)^3$ $\cdot(u^{12}-u^{10}+5u^8+6u^4-3u^2+1)(u^{50}+7u^{49}+\cdots+8u+4)$
c_{11}	$((u^2+1)^6)(u^4+u^3+u^2+1)(u^{15}+5u^{13}+\cdots+3u-1)$ $\cdot(u^{50}-2u^{49}+\cdots-152u+17)$
c_{12}	$((u-1)^{12})(u^4-u^3+3u^2-2u+1)(u^{15}-10u^{14}+\cdots+3u+1)$ $\cdot(u^{50}-62u^{49}+\cdots+11952u+289)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^{12})(y^4 - 11y^3 + \cdots + 10y + 1)(y^{15} - 10y^{14} + \cdots + 95y - 1)$ $\cdot\,(y^{50} + 58y^{49} + \cdots + 8224052y + 83521)$
c_2, c_6	$((y+1)^{12})(y^4 + 5y^3 + \cdots + 2y + 1)(y^{15} + 10y^{14} + \cdots + 3y - 1)$ $\cdot\,(y^{50} + 14y^{49} + \cdots + 5136y + 289)$
c_3	$16(4y^4 + 19y^3 + 31y^2 + 9y + 1)(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)^3$ $\cdot\,(y^6 - y^5 + 5y^4 + 6y^2 - 3y + 1)^2$ $\cdot\,(4y^{50} + 275y^{49} + \cdots + 639567407y + 15856324)$
c_4	$16(4y^4 + 19y^3 + 31y^2 + 9y + 1)(y^5 - 5y^4 + 8y^3 - 3y^2 - y - 1)^3$ $\cdot\,(y^6 + 3y^5 + 5y^4 + 4y^3 + 2y^2 + y + 1)^2$ $\cdot\,(4y^{50} + 115y^{49} + \cdots + 2592594386231y + 1979722164676)$
c_5, c_{11}	$((y+1)^{12})(y^4 + y^3 + 3y^2 + 2y + 1)(y^{15} + 10y^{14} + \cdots + 3y - 1)$ $\cdot\,(y^{50} + 62y^{49} + \cdots - 11952y + 289)$
c_7, c_9	$(y-1)^4(y^5 - 5y^4 + 8y^3 - 3y^2 - y - 1)^3$ $\cdot\,(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$ $\cdot\,(y^{50} - 40y^{49} + \cdots + 17759y + 256)$
c_8	$y^4(y^5 + 3y^4 + \cdots - y - 1)^3(y^6 - 3y^5 + \cdots - y + 1)^2$ $\cdot\,(y^{50} + 12y^{49} + \cdots - 1020928y + 65536)$
c_{10}	$(y^4 + 9y^3 + 31y^2 + 19y + 4)(y^5 - y^4 + 8y^3 - 3y^2 + 3y - 1)^3$ $\cdot\,((y^6 - y^5 + 5y^4 + 6y^2 - 3y + 1)^2)(y^{50} + y^{49} + \cdots + 152y + 16)$
c_{12}	$((y-1)^{12})(y^4 + 5y^3 + \cdots + 2y + 1)(y^{15} - 10y^{14} + \cdots + 95y - 1)$ $\cdot\,(y^{50} - 134y^{49} + \cdots - 132056732y + 83521)$