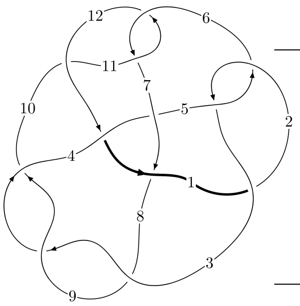
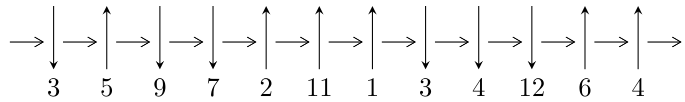
$12n_{0480}$ ($K12n_{0480}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^7 + 4u^6 - 9u^5 + 10u^4 - 6u^3 + b - u + 1,\ -u^7 + 4u^6 - 9u^5 + 10u^4 - 7u^3 + u^2 + a - u,$$
$$u^8 - 5u^7 + 13u^6 - 19u^5 + 17u^4 - 8u^3 + 3u^2 - 2u + 1\rangle$$
$$I_2^u = \langle -u^2a - u^2 + b,\ -u^7a - u^6a + u^7 - u^5a + u^6 + u^4a + u^5 - 2u^3a - 2u^4 + u^3 + a^2 - u^2 + a - 1,$$
$$u^8 + 2u^7 + 3u^6 + u^5 + 2u^4 + u^3 + 2u^2 + u + 1\rangle$$
$$I_3^u = \langle -u^7 + 3u^5 - 2u^3 + b - u + 1,\ -u^7 + 3u^5 - u^3 + u^2 + a - 3u,\ u^8 - u^7 - 3u^6 + 3u^5 + u^4 - 2u^3 + 3u^2 - 2u -$$
$$I_4^u = \langle 5u^7 - 17u^6 + 17u^5 + 28u^4 - 71u^3 + 8u^2 + 8b + 112u - 104,$$
$$17u^7 - 57u^6 + 61u^5 + 92u^4 - 231u^3 + 36u^2 + 32a + 356u - 344,$$
$$u^8 - 5u^7 + 9u^6 - 23u^4 + 24u^3 + 20u^2 - 56u + 32\rangle$$
$$I_5^u = \langle 2u^{11} + 5u^{10} + 5u^9 - 2u^8 - 7u^7 - 8u^6 - 9u^5 + 3u^4 - 4u^2a - 2u^3 + 7u^2 + 4b - 7u + 1,$$
$$6u^{11}a - 7u^{11} + \cdots - 9a + 25,\ u^{12} + 3u^{11} + 4u^{10} + u^9 - 3u^8 - 5u^7 - 6u^6 + 3u^3 - 3u^2 - 2u - 1\rangle$$
$$I_6^u = \langle -u^2a - u^2 + b,\ -u^3a + u^3 + a^2 + 2au + 2u^2 + a - u - 2,\ u^4 + u^3 - u^2 - u - 1\rangle$$

* 6 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 72 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. $\boldsymbol{I^u_1 = \langle -u^7 + 4u^6 - 9u^5 + 10u^4 - 6u^3 + b - u + 1,\ -u^7 + 4u^6 - 9u^5 + 10u^4 - 7u^3 + u^2 + a - u,\ u^8 - 5u^7 + \cdots - 2u + 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u^7 - 4u^6 + 9u^5 - 10u^4 + 7u^3 - u^2 + u\\u^7 - 4u^6 + 9u^5 - 10u^4 + 6u^3 + u - 1\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u\\-u^3 + u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}u^7 - 5u^6 + 12u^5 - 15u^4 + 10u^3 - 2u^2 + u - 1\\u^5 - 3u^4 + 4u^3 - 2u^2 - 1\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^7 - 5u^6 + 12u^5 - 15u^4 + 10u^3 - 2u^2 + u - 1\\-u^7 + 5u^6 - 11u^5 + 13u^4 - 8u^3 + 3u^2 - 2u + 1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^7 - 5u^6 + 13u^5 - 18u^4 + 14u^3 - 4u^2 + u - 2\\u^5 - 3u^4 + 4u^3 - 2u^2 - 1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u^7 - 4u^6 + 9u^5 - 10u^4 + 7u^3 - u^2 + 2u - 1\\u^7 - 4u^6 + 9u^5 - 10u^4 + 7u^3 - 2u^2 + 2u - 1\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}u^7 - 4u^6 + 9u^5 - 11u^4 + 8u^3 - 2u^2 - 1\\u^7 - 6u^6 + 14u^5 - 18u^4 + 11u^3 - 4u^2 + 2u - 2\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}u^7 - 5u^6 + 12u^5 - 16u^4 + 11u^3 - 3u^2 - 2\\-u^6 + 3u^5 - 5u^4 + 4u^3 - 2u^2 + u - 1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6u^7 - 30u^6 + 72u^5 - 90u^4 + 56u^3 - 4u^2 - 9$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^8 + 3u^7 + 8u^6 + 15u^5 + 19u^4 + 24u^3 + 18u^2 + 4u + 1$
c_2, c_5, c_6 c_{11}	$u^8 + 3u^7 + 6u^6 + 7u^5 + 7u^4 + 4u^3 + 2u^2 + 1$
c_3, c_4, c_8 c_9	$u^8 - 5u^7 + 13u^6 - 19u^5 + 17u^4 - 8u^3 + 3u^2 - 2u + 1$
c_7, c_{12}	$u^8 + u^7 - 6u^6 - 9u^5 + 11u^4 + 13u^3 + 9u^2 + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^8 + 7y^7 + 12y^6 - 29y^5 - 93y^4 + 4y^3 + 170y^2 + 20y + 1$
c_2, c_5, c_6 c_{11}	$y^8 + 3y^7 + 8y^6 + 15y^5 + 19y^4 + 24y^3 + 18y^2 + 4y + 1$
c_3, c_4, c_8 c_9	$y^8 + y^7 + 13y^6 + 7y^5 + 45y^4 - 12y^3 + 11y^2 + 2y + 1$
c_7, c_{12}	$y^8 - 13y^7 + 76y^6 - 221y^5 + 245y^4 + 53y^3 + 51y^2 + 14y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.652271 + 0.360769I$ $a = 0.732717 + 1.076160I$ $b = 0.005195 + 1.133280I$	$-4.98976 - 1.40911I$	$-5.93719 + 4.96219I$
$u = 0.652271 - 0.360769I$ $a = 0.732717 - 1.076160I$ $b = 0.005195 - 1.133280I$	$-4.98976 + 1.40911I$	$-5.93719 - 4.96219I$
$u = -0.260888 + 0.445572I$ $a = 0.965935 - 0.196423I$ $b = -0.302166 - 0.431430I$	$0.040580 + 1.038860I$	$0.71134 - 6.68770I$
$u = -0.260888 - 0.445572I$ $a = 0.965935 + 0.196423I$ $b = -0.302166 + 0.431430I$	$0.040580 - 1.038860I$	$0.71134 + 6.68770I$
$u = 0.89585 + 1.26725I$ $a = -0.831436 - 0.483431I$ $b = 0.962229 + 0.771104I$	$10.00520 - 2.02473I$	$3.02254 - 0.14098I$
$u = 0.89585 - 1.26725I$ $a = -0.831436 + 0.483431I$ $b = 0.962229 - 0.771104I$	$10.00520 + 2.02473I$	$3.02254 + 0.14098I$
$u = 1.21276 + 1.15424I$ $a = -1.367220 - 0.316333I$ $b = 0.834742 - 1.071900I$	$8.1034 - 15.2709I$	$0.20330 + 8.45960I$
$u = 1.21276 - 1.15424I$ $a = -1.367220 + 0.316333I$ $b = 0.834742 + 1.071900I$	$8.1034 + 15.2709I$	$0.20330 - 8.45960I$

II. $I_2^u =$
$\langle -u^2a-u^2+b,\ -u^7a+u^7+\cdots+a-1,\ u^8+2u^7+3u^6+u^5+2u^4+u^3+2u^2+u+1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}a\\u^2a+u^2\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}u^6a+u^5a+u^4a-u^3a+u^2a+u^3+a\\-u^7a-2u^6a-2u^5a+u^5-u^3a+u^4-u^2a-au-u^2-a\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^6a+u^5a+u^4a-u^3a+u^2a+u^3+a\\-u^6a+u^7-u^5a+u^6-2u^4a+u^5-2u^4-u^2a+u^2-a\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^7a-u^6a-u^5a+u^4a+u^5-2u^3a+u^4+u^3-au-u^2\\-u^7a-2u^6a-2u^5a+u^5-u^3a+u^4-u^2a-au-u^2-a\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u^7a+u^7+\cdots-a+1\\au\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}u^7+u^6+u^5-u^3a-u^4+u^3\\-u^7a-u^6a-u^7-2u^5a+u^4a-u^3a+3u^4-u^3-au+1\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-u^7a+u^7+\cdots-a+1\\-2u^7-3u^6-4u^5+u^3a-3u^3-2u^2-3u-1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -7u^7-9u^6-8u^5+13u^4-2u^3+4u^2-5u+4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{16} + 4u^{15} + \cdots + 128u + 256$
c_2, c_5, c_6 c_{11}	$u^{16} + 4u^{15} + \cdots + 48u + 16$
c_3, c_4, c_8 c_9	$(u^8 + 2u^7 + 3u^6 + u^5 + 2u^4 + u^3 + 2u^2 + u + 1)^2$
c_7, c_{12}	$u^{16} + 2u^{15} + \cdots + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{16} + 12y^{15} + \cdots + 237568y + 65536$
c_2, c_5, c_6 c_{11}	$y^{16} + 4y^{15} + \cdots + 128y + 256$
c_3, c_4, c_8 c_9	$(y^8 + 2y^7 + 9y^6 + 11y^5 + 12y^4 + 11y^3 + 6y^2 + 3y + 1)^2$
c_7, c_{12}	$y^{16} - 34y^{15} + \cdots + 34y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.669857 + 0.618731I$ $a = 0.519643 + 0.618737I$ $b = -0.412772 + 1.300430I$	$-0.68359 - 8.02114I$	$-3.38988 + 11.48011I$
$u = 0.669857 + 0.618731I$ $a = -2.17987 - 0.90212I$ $b = 0.670058 - 1.037450I$	$-0.68359 - 8.02114I$	$-3.38988 + 11.48011I$
$u = 0.669857 - 0.618731I$ $a = 0.519643 - 0.618737I$ $b = -0.412772 - 1.300430I$	$-0.68359 + 8.02114I$	$-3.38988 - 11.48011I$
$u = 0.669857 - 0.618731I$ $a = -2.17987 + 0.90212I$ $b = 0.670058 + 1.037450I$	$-0.68359 + 8.02114I$	$-3.38988 - 11.48011I$
$u = -0.575075 + 0.604029I$ $a = -0.206518 + 1.127330I$ $b = 0.756093 - 0.589737I$	$0.63668 + 2.58489I$	$-1.22299 - 5.26005I$
$u = -0.575075 + 0.604029I$ $a = 0.634679 - 0.563795I$ $b = -0.447489 - 1.116400I$	$0.63668 + 2.58489I$	$-1.22299 - 5.26005I$
$u = -0.575075 - 0.604029I$ $a = -0.206518 - 1.127330I$ $b = 0.756093 + 0.589737I$	$0.63668 - 2.58489I$	$-1.22299 + 5.26005I$
$u = -0.575075 - 0.604029I$ $a = 0.634679 + 0.563795I$ $b = -0.447489 + 1.116400I$	$0.63668 - 2.58489I$	$-1.22299 + 5.26005I$
$u = -0.046597 + 0.820905I$ $a = 0.633387 - 0.032164I$ $b = -1.099630 - 0.103355I$	$4.09203 + 2.71750I$	$9.92245 - 2.29698I$
$u = -0.046597 + 0.820905I$ $a = -2.18872 - 1.14293I$ $b = 0.711041 + 0.858664I$	$4.09203 + 2.71750I$	$9.92245 - 2.29698I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.046597 - 0.820905I$ $a = 0.633387 + 0.032164I$ $b = -1.099630 + 0.103355I$	$4.09203 - 2.71750I$	$9.92245 + 2.29698I$
$u = -0.046597 - 0.820905I$ $a = -2.18872 + 1.14293I$ $b = 0.711041 - 0.858664I$	$4.09203 - 2.71750I$	$9.92245 + 2.29698I$
$u = -1.04818 + 1.20777I$ $a = -0.761541 + 0.428484I$ $b = 0.999043 - 0.758029I$	$9.11436 + 8.57751I$	$1.69041 - 4.42296I$
$u = -1.04818 + 1.20777I$ $a = -1.45106 + 0.26117I$ $b = 0.823655 + 1.048040I$	$9.11436 + 8.57751I$	$1.69041 - 4.42296I$
$u = -1.04818 - 1.20777I$ $a = -0.761541 - 0.428484I$ $b = 0.999043 + 0.758029I$	$9.11436 - 8.57751I$	$1.69041 + 4.42296I$
$u = -1.04818 - 1.20777I$ $a = -1.45106 - 0.26117I$ $b = 0.823655 - 1.048040I$	$9.11436 - 8.57751I$	$1.69041 + 4.42296I$

III. $\boldsymbol{I^u_3 = \langle -u^7+3u^5-2u^3+b-u+1,\ -u^7+3u^5-u^3+u^2+a-3u,\ u^8-u^7-3u^6+3u^5+u^4-2u^3+3u^2-2u+1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u^7-3u^5+u^3-u^2+3u\\u^7-3u^5+2u^3+u-1\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}u^7-u^6-4u^5+3u^4+4u^3-2u^2+u-1\\u^5+u^4-2u^3-2u^2-1\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u^7+u^6+4u^5-3u^4-4u^3+2u^2-u+1\\u^7+u^6-3u^5-3u^4+2u^3+u^2+1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^7-u^6-3u^5+4u^4+2u^3-4u^2+u-2\\u^5+u^4-2u^3-2u^2-1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u^7+3u^5-u^3+u^2-2u-1\\-u^7+3u^5-u^3-2u+1\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}u^7-3u^5+u^4+2u^3-2u^2-1\\u^7-2u^5+2u^4-u^3-4u^2+2u-2\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-u^7+u^6+4u^5-2u^4-3u^3+u^2-4u\\u^6+u^5-u^4-2u^3-2u^2-u+1\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2u^7-2u^6-12u^5+2u^4+16u^3+4u+3$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^8 + 7y^7 + 28y^6 + 67y^5 + 99y^4 + 84y^3 + 34y^2 + 4y + 1$
c_2, c_5, c_6 c_{11}	$y^8 + 3y^7 + 8y^6 + 11y^5 + 15y^4 + 12y^3 + 10y^2 + 4y + 1$
c_3, c_4, c_8 c_9	$y^8 - 7y^7 + 17y^6 - 13y^5 - 7y^4 + 8y^3 + 3y^2 + 2y + 1$
c_7, c_{12}	$y^8 - y^7 + 4y^6 - 5y^5 + 5y^4 - 3y^3 + 7y^2 + 2y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.030890 + 0.718197I$ $a = 0.622175 + 1.173170I$ $b = -0.783128 - 0.675988I$	$3.07236 + 3.68820I$	$4.98393 - 5.29986I$
$u = -0.030890 - 0.718197I$ $a = 0.622175 - 1.173170I$ $b = -0.783128 + 0.675988I$	$3.07236 - 3.68820I$	$4.98393 + 5.29986I$
$u = 0.472052 + 0.470170I$ $a = 1.52839 + 1.41091I$ $b = -0.621805 + 1.124830I$	$0.10782 - 7.15810I$	$2.37662 + 6.44391I$
$u = 0.472052 - 0.470170I$ $a = 1.52839 - 1.41091I$ $b = -0.621805 - 1.124830I$	$0.10782 + 7.15810I$	$2.37662 - 6.44391I$
$u = -1.40119 + 0.27682I$ $a = -0.990196 + 0.324197I$ $b = 0.269993 + 0.604062I$	$-5.44591 + 2.04290I$	$-7.10763 + 1.33066I$
$u = -1.40119 - 0.27682I$ $a = -0.990196 - 0.324197I$ $b = 0.269993 - 0.604062I$	$-5.44591 - 2.04290I$	$-7.10763 - 1.33066I$
$u = 1.46003 + 0.07298I$ $a = -0.660372 + 0.409353I$ $b = 0.634940 + 0.942808I$	$-4.31401 + 5.00304I$	$-2.25292 - 6.22083I$
$u = 1.46003 - 0.07298I$ $a = -0.660372 - 0.409353I$ $b = 0.634940 - 0.942808I$	$-4.31401 - 5.00304I$	$-2.25292 + 6.22083I$

IV. $\boldsymbol{I_4^u} =$
$\langle \boldsymbol{5u^7-17u^6+\cdots+8b-104,\ 17u^7-57u^6+\cdots+32a-344,\ u^8-5u^7+\cdots-56u+32} \rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.531250u^7 + 1.78125u^6 + \cdots - 11.1250u + 10.7500 \\ -\frac{5}{8}u^7 + \frac{17}{8}u^6 + \cdots - 14u + 13 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} \frac{1}{32}u^7 - \frac{9}{32}u^6 + \cdots + \frac{19}{8}u - \frac{13}{4} \\ -\frac{3}{8}u^7 + \frac{13}{8}u^6 + \cdots - \frac{23}{2}u + 11 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{2}u^7 + \frac{15}{8}u^6 + \cdots - 13u + \frac{27}{2} \\ -\frac{3}{8}u^7 + \frac{7}{8}u^6 + \cdots - \frac{9}{2}u + 4 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.343750u^7 + 1.34375u^6 + \cdots - 9.12500u + 7.75000 \\ -\frac{3}{8}u^7 + \frac{13}{8}u^6 + \cdots - \frac{23}{2}u + 11 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} \frac{1}{32}u^7 - \frac{1}{32}u^6 + \cdots + \frac{7}{8}u + \frac{1}{4} \\ \frac{1}{8}u^7 - \frac{3}{8}u^6 + \cdots + 3u - 1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.218750u^7 + 0.968750u^6 + \cdots - 7.62500u + 8.75000 \\ -\frac{3}{8}u^7 + \frac{5}{8}u^6 + \cdots - \frac{3}{2}u + 3 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -0.218750u^7 + 0.718750u^6 + \cdots - 5.12500u + 4.25000 \\ -\frac{5}{8}u^7 + \frac{15}{8}u^6 + \cdots - 11u + 11 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 8u^7 - 30u^6 + 34u^5 + 46u^4 - 132u^3 + 26u^2 + 204u - 198$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^4 + u^3 + 3u^2 + 2u + 1)^2$
c_2, c_5, c_6 c_{11}	$(u^4 - u^3 + u^2 + 1)^2$
c_3, c_4, c_8 c_9	$u^8 - 5u^7 + 9u^6 - 23u^4 + 24u^3 + 20u^2 - 56u + 32$
c_7, c_{12}	$u^8 - 5u^6 - 7u^5 + 3u^4 + 20u^3 + 23u^2 - 5u + 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^2$
c_2, c_5, c_6 c_{11}	$(y^4 + y^3 + 3y^2 + 2y + 1)^2$
c_3, c_4, c_8 c_9	$y^8 - 7y^7 + \cdots - 1856y + 1024$
c_7, c_{12}	$y^8 - 10y^7 + 31y^6 - 33y^5 + 63y^4 - 352y^3 + 741y^2 + 67y + 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.307400+0.487823I$ $a=-0.954979-0.171241I$ $b=\ \ 0.351808+0.720342I$	$-5.35681+2.83021I$	$-5.65348-9.81749I$
$u=-1.307400-0.487823I$ $a=-0.954979+0.171241I$ $b=\ \ 0.351808-0.720342I$	$-5.35681-2.83021I$	$-5.65348+9.81749I$
$u=\ \ 1.408170+0.087291I$ $a=-0.681944-0.925546I$ $b=\ \ 0.351808-0.720342I$	$-5.35681-2.83021I$	$-5.65348+9.81749I$
$u=\ \ 1.408170-0.087291I$ $a=-0.681944+0.925546I$ $b=\ \ 0.351808+0.720342I$	$-5.35681+2.83021I$	$-5.65348-9.81749I$
$u=\ \ 1.30983+1.01957I$ $a=\ \ 1.331510+0.422810I$ $b=-0.851808+0.911292I$	$8.64668-6.32793I$	$1.65348+5.12960I$
$u=\ \ 1.30983-1.01957I$ $a=\ \ 1.331510-0.422810I$ $b=-0.851808-0.911292I$	$8.64668+6.32793I$	$1.65348-5.12960I$
$u=\ \ 1.08940+1.34521I$ $a=\ \ 0.680418+0.376735I$ $b=-0.851808-0.911292I$	$8.64668+6.32793I$	$1.65348-5.12960I$
$u=\ \ 1.08940-1.34521I$ $a=\ \ 0.680418-0.376735I$ $b=-0.851808+0.911292I$	$8.64668-6.32793I$	$1.65348+5.12960I$

V. $I^u_5 =$
$\langle 2u^{11}+5u^{10}+\cdots+4b+1,\ 6u^{11}a-7u^{11}+\cdots-9a+25,\ u^{12}+3u^{11}+\cdots-2u-1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= u^{11}+2u^{10}+u^9-3u^8-5u^7-5u^6-4u^5+7u^4+5u^3+6u^2-4u-3$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^4 + u^3 + 3u^2 + 2u + 1)^6$
c_2, c_5, c_6 c_{11}	$(u^4 - u^3 + u^2 + 1)^6$
c_3, c_4, c_8 c_9	$(u^{12} + 3u^{11} + 4u^{10} + u^9 - 3u^8 - 5u^7 - 6u^6 + 3u^3 - 3u^2 - 2u - 1)^2$
c_7, c_{12}	$u^{24} + 3u^{23} + \cdots + 2368u + 1016$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^6$
c_2, c_5, c_6 c_{11}	$(y^4 + y^3 + 3y^2 + 2y + 1)^6$
c_3, c_4, c_8 c_9	$(y^{12} - y^{11} + \cdots + 2y + 1)^2$
c_7, c_{12}	$y^{24} - 3y^{23} + \cdots - 1653152y + 1032256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.535167 + 0.929438I$ $a = 0.528827 + 0.711224I$ $b = 0.351808 - 0.720342I$	$1.64493 + 1.74886I$	$-2.00000 + 2.34394I$
$u = -0.535167 + 0.929438I$ $a = 1.197710 - 0.110412I$ $b = -0.851808 - 0.911292I$	$1.64493 + 1.74886I$	$-2.00000 + 2.34394I$
$u = -0.535167 - 0.929438I$ $a = 0.528827 - 0.711224I$ $b = 0.351808 + 0.720342I$	$1.64493 - 1.74886I$	$-2.00000 - 2.34394I$
$u = -0.535167 - 0.929438I$ $a = 1.197710 + 0.110412I$ $b = -0.851808 + 0.911292I$	$1.64493 - 1.74886I$	$-2.00000 - 2.34394I$
$u = 0.056867 + 1.089550I$ $a = 0.929613 + 0.375044I$ $b = -0.851808 - 0.911292I$	$1.64493 + 4.57907I$	$-2.00000 - 7.47354I$
$u = 0.056867 + 1.089550I$ $a = 0.066659 - 1.093490I$ $b = 0.351808 + 0.720342I$	$1.64493 + 4.57907I$	$-2.00000 - 7.47354I$
$u = 0.056867 - 1.089550I$ $a = 0.929613 - 0.375044I$ $b = -0.851808 + 0.911292I$	$1.64493 - 4.57907I$	$-2.00000 + 7.47354I$
$u = 0.056867 - 1.089550I$ $a = 0.066659 + 1.093490I$ $b = 0.351808 - 0.720342I$	$1.64493 - 4.57907I$	$-2.00000 + 7.47354I$
$u = 1.15037$ $a = -1.58111 + 0.54433I$ $b = 0.351808 + 0.720342I$	-5.35681	-5.65350
$u = 1.15037$ $a = -1.58111 - 0.54433I$ $b = 0.351808 - 0.720342I$	-5.35681	-5.65350

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.688565 + 0.422967I$ $a = 1.64391 + 0.26308I$ $b = -0.851808 + 0.911292I$	$1.64493 - 4.57907I$	$-2.00000 + 7.47354I$
$u = 0.688565 + 0.422967I$ $a = 0.24848 - 2.51053I$ $b = 0.351808 - 0.720342I$	$1.64493 - 4.57907I$	$-2.00000 + 7.47354I$
$u = 0.688565 - 0.422967I$ $a = 1.64391 - 0.26308I$ $b = -0.851808 - 0.911292I$	$1.64493 + 4.57907I$	$-2.00000 - 7.47354I$
$u = 0.688565 - 0.422967I$ $a = 0.24848 + 2.51053I$ $b = 0.351808 + 0.720342I$	$1.64493 + 4.57907I$	$-2.00000 - 7.47354I$
$u = -0.293143 + 0.369169I$ $a = 0.645814 - 1.117350I$ $b = -0.851808 + 0.911292I$	$1.64493 - 1.74886I$	$-2.00000 - 2.34394I$
$u = -0.293143 + 0.369169I$ $a = 0.25546 + 4.35284I$ $b = 0.351808 + 0.720342I$	$1.64493 - 1.74886I$	$-2.00000 - 2.34394I$
$u = -0.293143 - 0.369169I$ $a = 0.645814 + 1.117350I$ $b = -0.851808 - 0.911292I$	$1.64493 + 1.74886I$	$-2.00000 + 2.34394I$
$u = -0.293143 - 0.369169I$ $a = 0.25546 - 4.35284I$ $b = 0.351808 - 0.720342I$	$1.64493 + 1.74886I$	$-2.00000 + 2.34394I$
$u = -1.56338$ $a = -0.397494 + 0.294719I$ $b = 0.351808 + 0.720342I$	-5.35681	-5.65350
$u = -1.56338$ $a = -0.397494 - 0.294719I$ $b = 0.351808 - 0.720342I$	-5.35681	-5.65350

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.21061+1.15450I$ $a=\ \ 0.655793-0.383339I$ $b=-0.851808+0.911292I$	8.64668	$1.65348+0.I$
$u=-1.21061+1.15450I$ $a=\ \ 1.306340-0.414226I$ $b=-0.851808-0.911292I$	8.64668	$1.65348+0.I$
$u=-1.21061-1.15450I$ $a=\ \ 0.655793+0.383339I$ $b=-0.851808-0.911292I$	8.64668	$1.65348+0.I$
$u=-1.21061-1.15450I$ $a=\ \ 1.306340+0.414226I$ $b=-0.851808+0.911292I$	8.64668	$1.65348+0.I$

VI.

$\boldsymbol{I^u_6 = \langle -u^2a-u^2+b,\ -u^3a+u^3+a^2+2au+2u^2+a-u-2,\ u^4+u^3-u^2-u-1\rangle}$

(i) Arc colorings

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

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

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

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

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

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

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

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

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

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

$$a_{12} = \begin{pmatrix} -u^3a - 2u \\ -2u^3a - 2u^3 + au + a + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^3a - u^2a + a - 2u - 1 \\ -u^3a - u^3 - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^3 - 2u^2 - 11u - 1$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^8 - 3u^7 + 8u^6 - 13u^5 + 15u^4 - 13u^3 + 8u^2 - 3u + 1$
c_2, c_6	$u^8 + u^7 + 2u^6 + u^5 + 3u^4 + u^3 + 2u^2 + u + 1$
c_3	$(u^4 + u^3 - u^2 - u - 1)^2$
c_4, c_8, c_9	$(u^4 - u^3 - u^2 + u - 1)^2$
c_5, c_{11}	$u^8 - u^7 + 2u^6 - u^5 + 3u^4 - u^3 + 2u^2 - u + 1$
c_7, c_{12}	$u^8 + 2u^6 + 4u^5 + 2u^4 + 2u^3 + u^2 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^8 + 7y^7 + 16y^6 + 9y^5 - y^4 + 9y^3 + 16y^2 + 7y + 1$
c_2, c_5, c_6 c_{11}	$y^8 + 3y^7 + 8y^6 + 13y^5 + 15y^4 + 13y^3 + 8y^2 + 3y + 1$
c_3, c_4, c_8 c_9	$(y^4 - 3y^3 + y^2 + y + 1)^2$
c_7, c_{12}	$y^8 + 4y^7 + 8y^6 - 6y^5 - 6y^4 + 4y^3 + 5y^2 + 2y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.17872$ $a = -0.859870 + 0.705967I$ $b = 0.194695 + 0.980864I$	-6.97792	-11.8320
$u = 1.17872$ $a = -0.859870 - 0.705967I$ $b = 0.194695 - 0.980864I$	-6.97792	-11.8320
$u = -0.332924 + 0.670769I$ $a = 1.374520 - 0.115864I$ $b = -0.856931 - 1.021240I$	$2.07364 + 2.52742I$	$4.57778 - 6.72148I$
$u = -0.332924 + 0.670769I$ $a = -1.29620 - 1.30443I$ $b = -0.482162 + 0.574614I$	$2.07364 + 2.52742I$	$4.57778 - 6.72148I$
$u = -0.332924 - 0.670769I$ $a = 1.374520 + 0.115864I$ $b = -0.856931 + 1.021240I$	$2.07364 - 2.52742I$	$4.57778 + 6.72148I$
$u = -0.332924 - 0.670769I$ $a = -1.29620 + 1.30443I$ $b = -0.482162 - 0.574614I$	$2.07364 - 2.52742I$	$4.57778 + 6.72148I$
$u = -1.51288$ $a = -0.718456 + 0.334102I$ $b = 0.644397 + 0.764691I$	-3.74910	0.676060
$u = -1.51288$ $a = -0.718456 - 0.334102I$ $b = 0.644397 - 0.764691I$	-3.74910	0.676060

VII. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^4+u^3+3u^2+2u+1)^8$ $\cdot(u^8-3u^7+8u^6-13u^5+15u^4-13u^3+8u^2-3u+1)$ $\cdot(u^8-3u^7+8u^6-11u^5+15u^4-12u^3+10u^2-4u+1)$ $\cdot(u^8+3u^7+8u^6+15u^5+19u^4+24u^3+18u^2+4u+1)$ $\cdot(u^{16}+4u^{15}+\cdots+128u+256)$
c_2, c_6	$(u^4-u^3+u^2+1)^8(u^8+u^7+2u^6+u^5+3u^4+u^3+2u^2+u+1)$ $\cdot(u^8+u^7+2u^6+u^5+3u^4+2u^3+2u^2+1)$ $\cdot(u^8+3u^7+6u^6+7u^5+7u^4+4u^3+2u^2+1)$ $\cdot(u^{16}+4u^{15}+\cdots+48u+16)$
c_3	$(u^4+u^3-u^2-u-1)^2$ $\cdot(u^8-5u^7+9u^6-23u^4+24u^3+20u^2-56u+32)$ $\cdot(u^8-5u^7+13u^6-19u^5+17u^4-8u^3+3u^2-2u+1)$ $\cdot(u^8-u^7-3u^6+3u^5+u^4-2u^3+3u^2-2u+1)$ $\cdot(u^8+2u^7+3u^6+u^5+2u^4+u^3+2u^2+u+1)^2$ $\cdot(u^{12}+3u^{11}+4u^{10}+u^9-3u^8-5u^7-6u^6+3u^3-3u^2-2u-1)^2$
c_4, c_8, c_9	$(u^4-u^3-u^2+u-1)^2$ $\cdot(u^8-5u^7+9u^6-23u^4+24u^3+20u^2-56u+32)$ $\cdot(u^8-5u^7+13u^6-19u^5+17u^4-8u^3+3u^2-2u+1)$ $\cdot(u^8+u^7-3u^6-3u^5+u^4+2u^3+3u^2+2u+1)$ $\cdot(u^8+2u^7+3u^6+u^5+2u^4+u^3+2u^2+u+1)^2$ $\cdot(u^{12}+3u^{11}+4u^{10}+u^9-3u^8-5u^7-6u^6+3u^3-3u^2-2u-1)^2$
c_5, c_{11}	$(u^4-u^3+u^2+1)^8(u^8-u^7+2u^6-u^5+3u^4-2u^3+2u^2+1)$ $\cdot(u^8-u^7+2u^6-u^5+3u^4-u^3+2u^2-u+1)$ $\cdot(u^8+3u^7+6u^6+7u^5+7u^4+4u^3+2u^2+1)$ $\cdot(u^{16}+4u^{15}+\cdots+48u+16)$
c_7, c_{12}	$(u^8-5u^6-7u^5+3u^4+20u^3+23u^2-5u+2)$ $\cdot(u^8+2u^6+\cdots+u^2+1)(u^8-u^7-u^5+3u^4-3u^3+u^2+1)$ $\cdot(u^8+u^7-6u^6-9u^5+11u^4+13u^3+9u^2+2u+1)$ $\cdot(u^{16}+2u^{15}+\cdots+2u+1)(u^{24}+3u^{23}+\cdots+2368u+1016)$

VIII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^4+5y^3+7y^2+2y+1)^8$ $\cdot(y^8+7y^7+12y^6-29y^5-93y^4+4y^3+170y^2+20y+1)$ $\cdot(y^8+7y^7+16y^6+9y^5-y^4+9y^3+16y^2+7y+1)$ $\cdot(y^8+7y^7+28y^6+67y^5+99y^4+84y^3+34y^2+4y+1)$ $\cdot(y^{16}+12y^{15}+\cdots+237568y+65536)$
c_2, c_5, c_6 c_{11}	$(y^4+y^3+3y^2+2y+1)^8$ $\cdot(y^8+3y^7+8y^6+11y^5+15y^4+12y^3+10y^2+4y+1)$ $\cdot(y^8+3y^7+8y^6+13y^5+15y^4+13y^3+8y^2+3y+1)$ $\cdot(y^8+3y^7+8y^6+15y^5+19y^4+24y^3+18y^2+4y+1)$ $\cdot(y^{16}+4y^{15}+\cdots+128y+256)$
c_3, c_4, c_8 c_9	$(y^4-3y^3+y^2+y+1)^2$ $\cdot(y^8-7y^7+17y^6-13y^5-7y^4+8y^3+3y^2+2y+1)$ $\cdot(y^8-7y^7+\cdots-1856y+1024)$ $\cdot(y^8+y^7+13y^6+7y^5+45y^4-12y^3+11y^2+2y+1)$ $\cdot(y^8+2y^7+9y^6+11y^5+12y^4+11y^3+6y^2+3y+1)^2$ $\cdot(y^{12}-y^{11}+\cdots+2y+1)^2$
c_7, c_{12}	$(y^8-13y^7+76y^6-221y^5+245y^4+53y^3+51y^2+14y+1)$ $\cdot(y^8-10y^7+31y^6-33y^5+63y^4-352y^3+741y^2+67y+4)$ $\cdot(y^8-y^7+4y^6-5y^5+5y^4-3y^3+7y^2+2y+1)$ $\cdot(y^8+4y^7+8y^6-6y^5-6y^4+4y^3+5y^2+2y+1)$ $\cdot(y^{16}-34y^{15}+\cdots+34y+1)$ $\cdot(y^{24}-3y^{23}+\cdots-1653152y+1032256)$