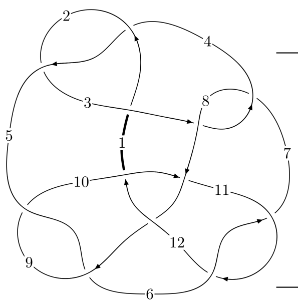
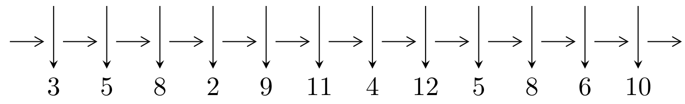
$12n_{0203}$ $(K12n_{0203})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &-51478029223711u^{17} - 94965699826026u^{16} + \cdots + 9603901893745904b - 98088892223296,\\
&- 2.34490 \times 10^{14}u^{17} - 5.69398 \times 10^{14}u^{16} + \cdots + 9.60390 \times 10^{15}a - 3.43754 \times 10^{16},\\
&u^{18} + 5u^{17} + \cdots - 108u + 16\rangle\\
I_2^u = \langle &-u^{11} - 4u^{10} - 3u^9 + 5u^8 + 7u^7 - 2u^6 - 4u^5 + u^4 + 2u^3 + u^2 + b + u,\\
&- u^{11} - 4u^{10} - 2u^9 + 9u^8 + 11u^7 - 3u^6 - 8u^5 - 2u^4 - 2u^3 - u^2 + a + 2u + 1,\\
&u^{12} + 5u^{11} + 7u^{10} - 3u^9 - 17u^8 - 13u^7 + 4u^6 + 12u^5 + 8u^4 + 2u^3 - 2u^2 - 2u - 1\rangle\\
I_3^u = \langle &a^2 + 2b - a + 2,\ a^3 + 2a + 1,\ u - 1\rangle\\
I_4^u = \langle &-14a^3u + 5a^3 - 10a^2u + 8a^2 + 27au + 31b - 3a + 12u + 9,\\
&a^4 + a^3 + 6a^2u + 14a^2 + 6au + 14a + 30u + 73,\ u^2 + 2u - 1\rangle\\
I_5^u = \langle &-a^3 + b - 2a + 1,\ a^4 - a^3 + 2a^2 - 2a + 1,\ u - 1\rangle
\end{aligned}$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 45 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. $I_1^u = \langle -5.15\times 10^{13}u^{17} - 9.50\times 10^{13}u^{16} + \cdots + 9.60\times 10^{15}b - 9.81\times 10^{13},\ -2.34\times 10^{14}u^{17} - 5.69\times 10^{14}u^{16} + \cdots + 9.60\times 10^{15}a - 3.44\times 10^{16},\ u^{18} + 5u^{17} + \cdots - 108u + 16\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^2+1\\-u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}0.0244161u^{17} + 0.0592882u^{16} + \cdots - 2.08611u + 3.57931\\0.00536012u^{17} + 0.00988824u^{16} + \cdots - 2.52686u + 0.0102134\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0.0244161u^{17} + 0.0592882u^{16} + \cdots - 2.08611u + 3.57931\\-0.0722239u^{17} - 0.275667u^{16} + \cdots + 4.64539u - 0.994467\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-0.00210596u^{17} - 0.0126160u^{16} + \cdots + 1.37231u - 1.55076\\-0.0194628u^{17} - 0.0641489u^{16} + \cdots + 1.60320u + 0.0763384\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}0.00368464u^{17} + 0.0157751u^{16} + \cdots - 1.75467u + 2.18995\\-0.0138662u^{17} - 0.0634618u^{16} + \cdots - 0.358806u - 0.0322530\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-0.0979771u^{17} - 0.396405u^{16} + \cdots + 9.53653u + 1.24502\\0.0102874u^{17} + 0.0611624u^{16} + \cdots - 2.32701u - 0.0719485\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-0.0882516u^{17} - 0.373557u^{16} + \cdots + 10.5756u + 1.08043\\-0.0373820u^{17} - 0.114869u^{16} + \cdots + 1.65191u - 0.649024\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-0.126113u^{17} - 0.483663u^{16} + \cdots + 11.1577u + 1.06434\\0.0672052u^{17} + 0.236972u^{16} + \cdots - 8.81033u + 0.956875\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{7248898902357663}{38415607574983616}u^{17} - \frac{19550123270823501}{19207803787491808}u^{16} + \cdots - \frac{537493149217709817}{9603901893745904}u - \frac{324060673357462 81}{2400975473436476}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{18} + 19u^{17} + \cdots + 15984u + 256$
c_2, c_4	$u^{18} - 5u^{17} + \cdots + 108u + 16$
c_3, c_7	$u^{18} - 9u^{16} + \cdots - 160u - 128$
c_5, c_6, c_9 c_{11}	$u^{18} + 4u^{16} + \cdots + u - 1$
c_8	$u^{18} + 9u^{17} + \cdots + 28u + 4$
c_{10}, c_{12}	$u^{18} - 4u^{17} + \cdots - 13u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{18} + 13y^{17} + \cdots - 211267328y + 65536$
c_2, c_4	$y^{18} - 19y^{17} + \cdots - 15984y + 256$
c_3, c_7	$y^{18} - 18y^{17} + \cdots - 257024y + 16384$
c_5, c_6, c_9 c_{11}	$y^{18} + 8y^{17} + \cdots - 13y + 1$
c_8	$y^{18} + 3y^{17} + \cdots + 88y + 16$
c_{10}, c_{12}	$y^{18} - 12y^{17} + \cdots - 27y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.498072 + 0.803560I$ $a = 0.804411 - 0.072881I$ $b = 0.601639 + 0.155591I$	$3.85179 + 0.21064I$	$-8.48737 - 0.11416I$
$u = -0.498072 - 0.803560I$ $a = 0.804411 + 0.072881I$ $b = 0.601639 - 0.155591I$	$3.85179 - 0.21064I$	$-8.48737 + 0.11416I$
$u = 0.854940$ $a = -0.328563$ $b = -2.47470$	-2.86169	-58.1310
$u = 0.731104 + 0.323621I$ $a = 0.210674 - 0.558567I$ $b = -0.567133 + 0.114177I$	$-0.825090 - 0.258812I$	$-11.03204 - 0.79258I$
$u = 0.731104 - 0.323621I$ $a = 0.210674 + 0.558567I$ $b = -0.567133 - 0.114177I$	$-0.825090 + 0.258812I$	$-11.03204 + 0.79258I$
$u = -1.067010 + 0.610706I$ $a = -0.142436 + 0.567488I$ $b = -0.526588 + 0.193604I$	$2.12814 + 5.07138I$	$-8.91832 - 8.83616I$
$u = -1.067010 - 0.610706I$ $a = -0.142436 - 0.567488I$ $b = -0.526588 - 0.193604I$	$2.12814 - 5.07138I$	$-8.91832 + 8.83616I$
$u = -1.236400 + 0.168858I$ $a = 0.057682 + 1.280350I$ $b = 0.079988 + 0.291227I$	$7.38910 - 4.84420I$	$-12.25477 - 0.83439I$
$u = -1.236400 - 0.168858I$ $a = 0.057682 - 1.280350I$ $b = 0.079988 - 0.291227I$	$7.38910 + 4.84420I$	$-12.25477 + 0.83439I$
$u = 1.41842 + 0.74975I$ $a = -0.720025 + 0.318355I$ $b = -1.45615 + 0.15501I$	$-3.70938 + 0.73390I$	$-13.05363 - 1.20335I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.41842 - 0.74975I$ $a = -0.720025 - 0.318355I$ $b = -1.45615 - 0.15501I$	$-3.70938 - 0.73390I$	$-13.05363 + 1.20335I$
$u = 1.22478 + 1.30063I$ $a = 0.896477 - 0.274017I$ $b = 1.44915 - 0.14091I$	$-2.93065 - 5.27680I$	$-11.38955 + 3.92982I$
$u = 1.22478 - 1.30063I$ $a = 0.896477 + 0.274017I$ $b = 1.44915 + 0.14091I$	$-2.93065 + 5.27680I$	$-11.38955 - 3.92982I$
$u = -1.73766 + 0.57784I$ $a = 0.621844 - 0.638194I$ $b = 1.94004 - 0.09952I$	$-12.9639 + 5.8348I$	$-10.78539 - 2.21152I$
$u = -1.73766 - 0.57784I$ $a = 0.621844 + 0.638194I$ $b = 1.94004 + 0.09952I$	$-12.9639 - 5.8348I$	$-10.78539 + 2.21152I$
$u = 0.132712$ $a = 3.15830$ $b = -0.353393$	-0.661114	-14.7530
$u = -1.82899 + 0.67910I$ $a = -0.768496 + 0.689009I$ $b = -2.10690 + 0.22733I$	$-11.7403 + 13.7046I$	$-10.51182 - 5.40024I$
$u = -1.82899 - 0.67910I$ $a = -0.768496 - 0.689009I$ $b = -2.10690 - 0.22733I$	$-11.7403 - 13.7046I$	$-10.51182 + 5.40024I$

II.

$$\boldsymbol{I^u_2 = \langle -u^{11}-4u^{10}+\cdots+b+u,\ -u^{11}-4u^{10}+\cdots+a+1,\ u^{12}+5u^{11}+\cdots-2u-1\rangle}$$

(i) Arc colorings

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

$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$

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

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

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

$$a_{10} = \begin{pmatrix}u^{11}+4u^{10}+2u^9-9u^8-11u^7+3u^6+8u^5+2u^4+2u^3+u^2-2u-1\\u^{11}+4u^{10}+3u^9-5u^8-7u^7+2u^6+4u^5-u^4-2u^3-u^2-u\end{pmatrix}$$

$$a_9 = \begin{pmatrix}u^{11}+4u^{10}+2u^9-9u^8-11u^7+3u^6+8u^5+2u^4+2u^3+u^2-2u-1\\u^{11}+3u^{10}-4u^8+2u^7+8u^6-2u^5-8u^4-4u^3+1\end{pmatrix}$$

$$a_6 = \begin{pmatrix}u^{11}+5u^{10}+\cdots-4u-3\\u^{10}+4u^9+2u^8-9u^7-12u^6+7u^4+4u^3+2u^2-u-1\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}-u^{11}-5u^{10}+\cdots+3u+3\\-u^{11}-5u^{10}-8u^9-2u^8+9u^7+11u^6+5u^5-u^4-4u^3-5u^2-u\end{pmatrix}$$

$$a_8 = \begin{pmatrix}-2u^{11}-8u^{10}-6u^9+12u^8+22u^7+3u^6-14u^5-10u^4-u^3+2u+1\\u^8+3u^7-5u^5-3u^4+2u^3+u^2+u\end{pmatrix}$$

$$a_7 = \begin{pmatrix}-2u^{11}-8u^{10}-5u^9+15u^8+22u^7-2u^6-17u^5-8u^4+u^2+2u+1\\-u^{11}-3u^{10}+u^9+9u^8+6u^7-7u^6-9u^5-2u^4+3u^3+2u^2+u\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}u^{11}+4u^{10}+2u^9-9u^8-11u^7+3u^6+8u^5+2u^4+2u^3-2u\\u^{11}+4u^{10}+3u^9-5u^8-7u^7+2u^6+4u^5-u^3-2u^2-2u\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= u^{11}+3u^{10}+2u^9-7u^7-16u^6-15u^5+5u^4+10u^3+10u^2+5u-2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{12} - 31y^{11} + \cdots - 8y + 1$
c_2, c_4	$y^{12} - 11y^{11} + \cdots - 4y^2 + 1$
c_3, c_7	$y^{12} - 6y^{11} + \cdots + 4y + 1$
c_5, c_6, c_9 c_{11}	$y^{12} + 8y^{11} + \cdots - 69y + 1$
c_8	$y^{12} + y^{11} + \cdots - 20y + 1$
c_{10}, c_{12}	$y^{12} - 20y^{11} + \cdots + y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.057460 + 0.095971I$ $a = -0.406859 - 1.196210I$ $b = -3.90485 + 1.89018I$	$3.16210 - 2.20591I$	$-7.78632 - 10.61857I$
$u = 1.057460 - 0.095971I$ $a = -0.406859 + 1.196210I$ $b = -3.90485 - 1.89018I$	$3.16210 + 2.20591I$	$-7.78632 + 10.61857I$
$u = -1.069100 + 0.511997I$ $a = -0.555353 + 0.877193I$ $b = -0.927124 - 0.102377I$	$4.24653 + 6.29114I$	$-8.72473 - 7.60786I$
$u = -1.069100 - 0.511997I$ $a = -0.555353 - 0.877193I$ $b = -0.927124 + 0.102377I$	$4.24653 - 6.29114I$	$-8.72473 + 7.60786I$
$u = 0.716863$ $a = -0.162026$ $b = -1.91362$	-2.72064	6.26870
$u = -0.462027 + 0.528026I$ $a = 1.05312 - 1.37955I$ $b = 0.804945 - 0.512875I$	$6.06972 - 2.00606I$	$-4.60411 + 0.72202I$
$u = -0.462027 - 0.528026I$ $a = 1.05312 + 1.37955I$ $b = 0.804945 + 0.512875I$	$6.06972 + 2.00606I$	$-4.60411 - 0.72202I$
$u = -1.154720 + 0.677187I$ $a = -0.051735 - 0.619586I$ $b = -0.108869 - 0.166947I$	$2.03383 + 4.28434I$	$-10.27189 + 0.84720I$
$u = -1.154720 - 0.677187I$ $a = -0.051735 + 0.619586I$ $b = -0.108869 + 0.166947I$	$2.03383 - 4.28434I$	$-10.27189 - 0.84720I$
$u = -0.034452 + 0.645190I$ $a = -1.85887 - 0.62285I$ $b = -0.388161 + 0.546694I$	$5.19852 + 1.22317I$	$-3.65798 - 0.64482I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.034452-0.645190I$ $a=-1.85887+0.62285I$ $b=-0.388161-0.546694I$	$5.19852-1.22317I$	$-3.65798+0.64482I$
$u=-2.39117$ $a=\ \ 0.801439$ $b=\ \ 1.96174$	-15.6717	-10.1790

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{15}{4}a^2 + \frac{15}{2}a - \frac{31}{4}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0.22670 + 1.46771I$ $b = 0.164742 + 0.401127I$	$7.79580 - 5.13794I$	$1.83568 + 8.51237I$
$u = 1.00000$ $a = 0.22670 - 1.46771I$ $b = 0.164742 - 0.401127I$	$7.79580 + 5.13794I$	$1.83568 - 8.51237I$
$u = 1.00000$ $a = -0.453398$ $b = -1.32948$	-2.43213	-11.9210

IV.

$$\boldsymbol{I^u_4 = \langle -14a^3u - 10a^2u + \cdots - 3a + 9,\ 6a^2u + 6au + \cdots + 14a + 73,\ u^2 + 2u - 1\rangle}$$

(i) Arc colorings

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

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix} u \\ -4u+2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ 0.451613a^3u + 0.322581a^2u + \cdots + 0.0967742a - 0.290323 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} a \\ 0.451613a^3u + 0.322581a^2u + \cdots - 0.903226a - 0.290323 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -a^2u \\ -0.161290a^3u + 3.74194a^2u + \cdots + 0.322581a + 1.03226 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.322581a^3u - 0.516129a^2u + \cdots + 0.645161a + 2.06452 \\ 0.774194a^3u + 1.83871a^2u + \cdots - 0.548387a + 0.645161 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -1 \\ -u+1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 3u-2 \\ -15u+7 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.451613a^3u - 0.322581a^2u + \cdots - 0.0967742a + 0.290323 \\ 1.96774a^3u + 1.54839a^2u + \cdots + 3.06452a - 0.193548 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{56}{31}a^3u + \frac{20}{31}a^3 - \frac{40}{31}a^2u + \frac{32}{31}a^2 - \frac{16}{31}au - \frac{12}{31}a + \frac{48}{31}u - \frac{212}{31}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^2+6u+1)^4$
c_2, c_4	$(u^2-2u-1)^4$
c_3, c_7	$(u^2-4u+2)^4$
c_5, c_6, c_9 c_{11}	$u^8+2u^7-u^6+14u^4-18u^3+56u^2-40u+49$
c_8	$(u^2-u+1)^4$
c_{10}, c_{12}	$u^8+2u^7-35u^6-16u^5+570u^4-1118u^3+1720u^2-1316u+409$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^2 - 34y + 1)^4$
c_2, c_4	$(y^2 - 6y + 1)^4$
c_3, c_7	$(y^2 - 12y + 4)^4$
c_5, c_6, c_9 c_{11}	$y^8 - 6y^7 + \cdots + 3888y + 2401$
c_8	$(y^2 + y + 1)^4$
c_{10}, c_{12}	$y^8 - 74y^7 + \cdots - 324896y + 167281$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.414214$ $a = -1.07609 + 2.49104I$ $b = 0.945731 - 0.165796I$	$4.11234 + 2.02988I$	$-10.00000 - 3.46410I$
$u = 0.414214$ $a = -1.07609 - 2.49104I$ $b = 0.945731 + 0.165796I$	$4.11234 - 2.02988I$	$-10.00000 + 3.46410I$
$u = 0.414214$ $a = 0.57609 + 3.35706I$ $b = 0.26138 - 2.25657I$	$4.11234 - 2.02988I$	$-10.00000 + 3.46410I$
$u = 0.414214$ $a = 0.57609 - 3.35706I$ $b = 0.26138 + 2.25657I$	$4.11234 + 2.02988I$	$-10.00000 - 3.46410I$
$u = -2.41421$ $a = -1.037090 + 0.476159I$ $b = -2.00374 + 0.28352I$	$-15.6269 - 2.0299I$	$-10.00000 + 3.46410I$
$u = -2.41421$ $a = -1.037090 - 0.476159I$ $b = -2.00374 - 0.28352I$	$-15.6269 + 2.0299I$	$-10.00000 - 3.46410I$
$u = -2.41421$ $a = 0.537085 + 0.389866I$ $b = 1.79664 + 0.07519I$	$-15.6269 - 2.0299I$	$-10.00000 + 3.46410I$
$u = -2.41421$ $a = 0.537085 - 0.389866I$ $b = 1.79664 - 0.07519I$	$-15.6269 + 2.0299I$	$-10.00000 - 3.46410I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4a^3 + 4a - 12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0.621744 + 0.440597I$ $b = 0.121744 + 1.306620I$	$1.64493 - 2.02988I$	$-10.00000 + 3.46410I$
$u = 1.00000$ $a = 0.621744 - 0.440597I$ $b = 0.121744 - 1.306620I$	$1.64493 + 2.02988I$	$-10.00000 - 3.46410I$
$u = 1.00000$ $a = -0.121744 + 1.306620I$ $b = -0.621744 + 0.440597I$	$1.64493 + 2.02988I$	$-10.00000 - 3.46410I$
$u = 1.00000$ $a = -0.121744 - 1.306620I$ $b = -0.621744 - 0.440597I$	$1.64493 - 2.02988I$	$-10.00000 + 3.46410I$

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^7)(u^2+6u+1)^4(u^{12}-11u^{11}+\cdots-4u^2+1)$ $\cdot(u^{18}+19u^{17}+\cdots+15984u+256)$
c_2	$((u-1)^7)(u^2-2u-1)^4(u^{12}+5u^{11}+\cdots-2u-1)$ $\cdot(u^{18}-5u^{17}+\cdots+108u+16)$
c_3	$u^7(u^2-4u+2)^4(u^{12}+4u^{11}+\cdots-2u-1)$ $\cdot(u^{18}-9u^{16}+\cdots-160u-128)$
c_4	$((u+1)^7)(u^2-2u-1)^4(u^{12}-5u^{11}+\cdots+2u-1)$ $\cdot(u^{18}-5u^{17}+\cdots+108u+16)$
c_5	$(u^3+2u-1)(u^4+u^3+2u^2+2u+1)$ $\cdot(u^8+2u^7-u^6+14u^4-18u^3+56u^2-40u+49)$ $\cdot(u^{12}+4u^{10}+\cdots-7u+1)(u^{18}+4u^{16}+\cdots+u-1)$
c_6	$(u^3+2u-1)(u^4+u^3+2u^2+2u+1)$ $\cdot(u^8+2u^7-u^6+14u^4-18u^3+56u^2-40u+49)$ $\cdot(u^{12}+4u^{10}+\cdots+7u+1)(u^{18}+4u^{16}+\cdots+u-1)$
c_7	$u^7(u^2-4u+2)^4(u^{12}-4u^{11}+\cdots+2u-1)$ $\cdot(u^{18}-9u^{16}+\cdots-160u-128)$
c_8	$(u^2-u+1)^4(u^2+u+1)^2(u^3-3u^2+5u-2)$ $\cdot(u^{12}+3u^{11}+5u^{10}+2u^9-u^8-4u^7+3u^6+3u^4-6u^3-2u^2-4u+1)$ $\cdot(u^{18}+9u^{17}+\cdots+28u+4)$
c_9	$(u^3+2u+1)(u^4-u^3+2u^2-2u+1)$ $\cdot(u^8+2u^7-u^6+14u^4-18u^3+56u^2-40u+49)$ $\cdot(u^{12}+4u^{10}+\cdots+7u+1)(u^{18}+4u^{16}+\cdots+u-1)$
c_{10}, c_{12}	$(u^3+2u+1)(u^4-u^3+2u^2-2u+1)$ $\cdot(u^8+2u^7-35u^6-16u^5+570u^4-1118u^3+1720u^2-1316u+409)$ $\cdot(u^{12}+4u^{11}-2u^{10}+6u^9+3u^8+3u^6+4u^5-u^4-2u^3+5u^2-3u+1)$ $\cdot(u^{18}-4u^{17}+\cdots-13u+1)$
c_{11}	$(u^3+2u+1)(u^4-u^3+2u^2-2u+1)$ $\cdot(u^8+2u^7-u^6+14u^4-18u^3+56u^2-40u+49)$ $\cdot(u^{12}+4u^{10}+\cdots-7u+1)(u^{18}+4u^{16}+\cdots+u-1)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^7)(y^2-34y+1)^4(y^{12}-31y^{11}+\cdots-8y+1)$ $\cdot\,(y^{18}+13y^{17}+\cdots-211267328y+65536)$
c_2, c_4	$((y-1)^7)(y^2-6y+1)^4(y^{12}-11y^{11}+\cdots-4y^2+1)$ $\cdot\,(y^{18}-19y^{17}+\cdots-15984y+256)$
c_3, c_7	$y^7(y^2-12y+4)^4(y^{12}-6y^{11}+\cdots+4y+1)$ $\cdot\,(y^{18}-18y^{17}+\cdots-257024y+16384)$
c_5, c_6, c_9 c_{11}	$(y^3+4y^2+4y-1)(y^4+3y^3+2y^2+1)(y^8-6y^7+\cdots+3888y+2401)$ $\cdot\,(y^{12}+8y^{11}+\cdots-69y+1)(y^{18}+8y^{17}+\cdots-13y+1)$
c_8	$((y^2+y+1)^6)(y^3+y^2+13y-4)(y^{12}+y^{11}+\cdots-20y+1)$ $\cdot\,(y^{18}+3y^{17}+\cdots+88y+16)$
c_{10}, c_{12}	$(y^3+4y^2+4y-1)(y^4+3y^3+2y^2+1)$ $\cdot\,(y^8-74y^7+\cdots-324896y+167281)(y^{12}-20y^{11}+\cdots+y+1)$ $\cdot\,(y^{18}-12y^{17}+\cdots-27y+1)$