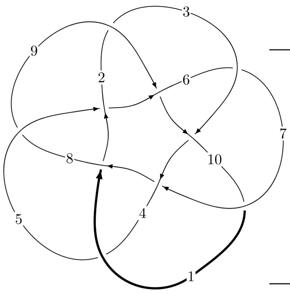
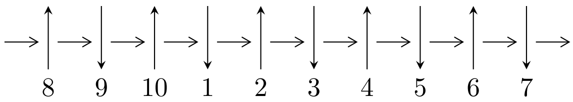
10_{123} ($K10a_{121}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

[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`).

$$
\begin{aligned}
I^u_1 &= \langle u^3 + 2u^2 + b + 2u + 1,\ a - 1,\ u^4 + 3u^3 + 4u^2 + 2u + 1\rangle \\
I^u_2 &= \langle u^3 + b + 1,\ a + 1,\ u^4 - u^3 + 2u - 1\rangle \\
I^u_3 &= \langle -6u^9 + 3u^8 + 17u^7 - 22u^6 - 19u^5 + 31u^4 + 5u^3 - 22u^2 + 2b + 2u + 6, \\
&\quad 6u^9 - 21u^8 + 13u^7 + 31u^6 - 48u^5 - 5u^4 + 36u^3 - 13u^2 + 2a - 9u + 2, \\
&\quad 3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1\rangle \\
I^u_4 &= \langle 18u^9 - 30u^8 - 9u^7 + 67u^6 - 26u^5 - 41u^4 + 35u^3 + 7u^2 + 2b - 8u,\ a - 1, \\
&\quad 3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1\rangle \\
I^u_5 &= \langle -2u^9 + 7u^8 - 14u^7 + 19u^6 - 27u^5 + 34u^4 - 40u^3 + 33u^2 + 2b - 22u + 6, \\
&\quad - 4u^9 + 14u^8 - 28u^7 + 41u^6 - 58u^5 + 73u^4 - 81u^3 + 76u^2 + 6a - 50u + 23, \\
&\quad u^{10} - 4u^9 + 9u^8 - 14u^7 + 20u^6 - 26u^5 + 31u^4 - 30u^3 + 23u^2 - 12u + 3\rangle \\
I^u_6 &= \langle 5u^9 - 20u^8 + 42u^7 - 61u^6 + 85u^5 - 109u^4 + 125u^3 - 114u^2 + 6b + 79u - 30, \\
&\quad u^9 + 2u^8 - 9u^7 + 19u^6 - 22u^5 + 34u^4 - 41u^3 + 54u^2 + 6a - 40u + 24, \\
&\quad u^{10} - 4u^9 + 9u^8 - 14u^7 + 20u^6 - 26u^5 + 31u^4 - 30u^3 + 23u^2 - 12u + 3\rangle \\
I^u_7 &= \langle -17u^9 - 123u^8 - 488u^7 - 1301u^6 - 2539u^5 - 3687u^4 - 4024u^3 - 3128u^2 + 144b - 1616u - 496, \\
&\quad u^9 + 21u^8 + 118u^7 + 397u^6 + 917u^5 + 1557u^4 + 1958u^3 + 1792u^2 + 96a + 1096u + 416, \\
&\quad u^{10} + 7u^9 + 28u^8 + 77u^7 + 159u^6 + 251u^5 + 308u^4 + 288u^3 + 200u^2 + 96u + 32\rangle \\
I^u_8 &= \langle a^3u^2 - 2a^2u^2 + a^2u + u^2a + ba + a^2 - au - a + 1,\ a^2u^2 - u^2a + bu + au + b + a,\ u^3a^2 - u^3a + au - u - 1\rangle
\end{aligned}
$$

* 7 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 58 representations.
* 1 irreducible components of $\dim_{\mathbb{C}} = 1$

[2]All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I. $I_1^u = \langle u^3 + 2u^2 + b + 2u + 1,\ a - 1,\ u^4 + 3u^3 + 4u^2 + 2u + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -5u^3 - 10u^2 - 15u - 5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.190983 + 0.587785I$ $a = \quad 1.00000$ $b = -0.190983 - 0.587785I$	$1.38939I$	$0. - 5.87785I$
$u = -0.190983 - 0.587785I$ $a = \quad 1.00000$ $b = -0.190983 + 0.587785I$	$-1.38939I$	$0. + 5.87785I$
$u = -1.30902 + 0.95106I$ $a = \quad 1.00000$ $b = -1.30902 - 0.95106I$	$17.0857I$	$0. - 9.51057I$
$u = -1.30902 - 0.95106I$ $a = \quad 1.00000$ $b = -1.30902 + 0.95106I$	$-17.0857I$	$0. + 9.51057I$

II. $\boldsymbol{I_2^u = \langle u^3 + b + 1,\ a + 1,\ u^4 - u^3 + 2u - 1 \rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 5u^3 + 5u + 5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.15372$ $a = -1.00000$ $b = 0.535687$	-4.48216	-8.44700
$u = 0.809017 + 0.981593I$ $a = -1.00000$ $b = 0.809017 - 0.981593I$	$-9.37207I$	$0. + 9.81593I$
$u = 0.809017 - 0.981593I$ $a = -1.00000$ $b = 0.809017 + 0.981593I$	$9.37207I$	$0. - 9.81593I$
$u = 0.535687$ $a = -1.00000$ $b = -1.15372$	4.48216	8.44700

III.

$\boldsymbol{I_3^u = \langle -6u^9+3u^8+\cdots+2b+6,\ 6u^9-21u^8+\cdots+2a+2,\ 3u^{10}-6u^9+\cdots-5u^2+1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -3u^9 + \frac{21}{2}u^8 + \cdots + \frac{9}{2}u - 1 \\ 3u^9 - \frac{3}{2}u^8 + \cdots - u - 3 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 9u^8 - 15u^7 + \cdots + \frac{7}{2}u - 4 \\ 3u^9 - \frac{3}{2}u^8 + \cdots - u - 3 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 12u^9 - \frac{27}{2}u^8 + \cdots - 11u - 3 \\ \frac{3}{2}u^9 - 3u^8 + \cdots - 3u - \frac{1}{2} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 9u^8 - 15u^7 + \cdots + \frac{9}{2}u - 4 \\ 3u^9 - \frac{3}{2}u^8 + \cdots - u - 3 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -3u^8 + 3u^7 + 4u^6 - 10u^5 - 2u^4 + 8u^3 - 3u^2 - 5u + 1 \\ -\frac{9}{2}u^9 + \frac{9}{2}u^8 + \cdots + 2u + \frac{5}{2} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -21u^9 + \frac{75}{2}u^8 + \cdots + \frac{21}{2}u + \frac{1}{2} \\ -6u^9 + \frac{21}{2}u^8 + \cdots + \frac{9}{2}u + 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 12u^9 + 6u^8 - 64u^7 + 52u^6 + 90u^5 - 110u^4 - 30u^3 + 86u^2 - 4u - 24$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{10} - 7u^9 + \cdots - 96u + 32$
c_2, c_{10}	$u^{10} - 4u^9 + \cdots - 12u + 3$
c_3, c_9	$3(3u^{10} + 6u^9 - u^8 - 14u^7 - 8u^6 + 10u^5 + 11u^4 - 2u^3 - 5u^2 + 1)$
c_4, c_8	$3(3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1)$
c_5, c_7	$u^{10} + 4u^9 + \cdots + 12u + 3$
c_6	$u^{10} + 7u^9 + \cdots + 96u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{10} + 7y^9 + \cdots + 3584y + 1024$
c_2, c_5, c_7 c_{10}	$y^{10} + 2y^9 + 9y^8 + 18y^7 + 36y^6 + 48y^5 + 39y^4 + 22y^3 - 5y^2 - 6y + 9$
c_3, c_4, c_8 c_9	$9(9y^{10} - 42y^9 + \cdots - 10y + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.983280+0.164908I$ $a=-0.716079+0.118069I$ $b=\ \ 0.724687-0.940396I$	$-3.61397+2.21654I$	$-5.38699-4.72022I$
$u=-0.983280-0.164908I$ $a=-0.716079-0.118069I$ $b=\ \ 0.724687+0.940396I$	$-3.61397-2.21654I$	$-5.38699+4.72022I$
$u=\ \ 0.707358+0.648629I$ $a=-0.105697-1.232530I$ $b=\ \ 0.684636-0.234182I$	$3.61397-2.21654I$	$5.38699+4.72022I$
$u=\ \ 0.707358-0.648629I$ $a=-0.105697+1.232530I$ $b=\ \ 0.684636+0.234182I$	$3.61397+2.21654I$	$5.38699-4.72022I$
$u=\ \ 0.744942+0.201707I$ $a=\ \ 1.81391+0.74172I$ $b=-0.719811+1.046890I$	$-2.49243-8.64801I$	$-4.04126+7.50135I$
$u=\ \ 0.744942-0.201707I$ $a=\ \ 1.81391-0.74172I$ $b=-0.719811-1.046890I$	$-2.49243+8.64801I$	$-4.04126-7.50135I$
$u=\ \ 1.081500+0.798609I$ $a=-0.893282-0.308372I$ $b=\ \ 1.20165-0.91842I$	$2.49243-8.64801I$	$4.04126+7.50135I$
$u=\ \ 1.081500-0.798609I$ $a=-0.893282+0.308372I$ $b=\ \ 1.20165+0.91842I$	$2.49243+8.64801I$	$4.04126-7.50135I$
$u=-0.550514+0.187402I$ $a=\ \ 0.40115-1.75920I$ $b=\ \ 0.108840-1.043640I$	$0.806279I$	$0.-8.22652I$
$u=-0.550514-0.187402I$ $a=\ \ 0.40115+1.75920I$ $b=\ \ 0.108840+1.043640I$	$-\ 0.806279I$	$0.+8.22652I$

IV. $I_4^u = \langle 18u^9 - 30u^8 + \cdots + 2b - 8u,\ a - 1,\ 3u^{10} - 6u^9 + \cdots - 5u^2 + 1\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ -9u^9 + 15u^8 + \cdots - \frac{7}{2}u^2 + 4u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -9u^9 + 15u^8 + \cdots + 4u + 1 \\ -9u^9 + 15u^8 + \cdots - \frac{7}{2}u^2 + 4u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{3}{2}u^9 - \frac{3}{2}u^8 + \cdots - 3u + \frac{5}{2} \\ \frac{3}{2}u^9 - 3u^8 + \cdots - 3u - \frac{1}{2} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{9}{2}u^9 + \frac{15}{2}u^8 + \cdots + 3u + 2 \\ -6u^9 + \frac{21}{2}u^8 + \cdots + \frac{5}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ -3u^9 + \frac{3}{2}u^8 + \cdots + u + 3 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{9}{2}u^9 + \frac{15}{2}u^8 + \cdots + 3u + 2 \\ -\frac{9}{2}u^9 + 6u^8 + \cdots + \frac{5}{2}u + \frac{1}{2} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -\frac{3}{2}u^9 + \frac{3}{2}u^8 + \cdots - u - \frac{3}{2} \\ \frac{3}{2}u^9 - \frac{3}{2}u^8 + \cdots - \frac{3}{2}u - 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 12u^9 + 6u^8 - 64u^7 + 52u^6 + 90u^5 - 110u^4 - 30u^3 + 86u^2 - 4u - 24$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3	$u^{10} + 4u^9 + \cdots + 12u + 3$
c_2	$u^{10} + 7u^9 + \cdots + 96u + 32$
c_4, c_{10}	$3(3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1)$
c_5, c_9	$3(3u^{10} + 6u^9 - u^8 - 14u^7 - 8u^6 + 10u^5 + 11u^4 - 2u^3 - 5u^2 + 1)$
c_6, c_8	$u^{10} - 4u^9 + \cdots - 12u + 3$
c_7	$u^{10} - 7u^9 + \cdots - 96u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^{10} + 2y^9 + 9y^8 + 18y^7 + 36y^6 + 48y^5 + 39y^4 + 22y^3 - 5y^2 - 6y + 9$
c_2, c_7	$y^{10} + 7y^9 + \cdots + 3584y + 1024$
c_4, c_5, c_9 c_{10}	$9(9y^{10} - 42y^9 + \cdots - 10y + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.983280 + 0.164908I$ $a = 1.00000$ $b = -0.127144 - 0.809997I$	$-3.61397 + 2.21654I$	$-5.38699 - 4.72022I$
$u = -0.983280 - 0.164908I$ $a = 1.00000$ $b = -0.127144 + 0.809997I$	$-3.61397 - 2.21654I$	$-5.38699 + 4.72022I$
$u = 0.707358 + 0.648629I$ $a = 1.00000$ $b = -1.36087 + 0.66197I$	$3.61397 - 2.21654I$	$5.38699 + 4.72022I$
$u = 0.707358 - 0.648629I$ $a = 1.00000$ $b = -1.36087 - 0.66197I$	$3.61397 + 2.21654I$	$5.38699 - 4.72022I$
$u = 0.744942 + 0.201707I$ $a = 1.00000$ $b = -0.45427 - 1.55310I$	$-2.49243 - 8.64801I$	$-4.04126 + 7.50135I$
$u = 0.744942 - 0.201707I$ $a = 1.00000$ $b = -0.45427 + 1.55310I$	$-2.49243 + 8.64801I$	$-4.04126 - 7.50135I$
$u = 1.081500 + 0.798609I$ $a = 1.00000$ $b = -1.31322 + 1.08050I$	$2.49243 - 8.64801I$	$4.04126 + 7.50135I$
$u = 1.081500 - 0.798609I$ $a = 1.00000$ $b = -1.31322 - 1.08050I$	$2.49243 + 8.64801I$	$4.04126 - 7.50135I$
$u = -0.550514 + 0.187402I$ $a = 1.00000$ $b = -0.24450 - 1.63857I$	$0.806279I$	$0. - 8.22652I$
$u = -0.550514 - 0.187402I$ $a = 1.00000$ $b = -0.24450 + 1.63857I$	$-\,0.806279I$	$0. + 8.22652I$

V. $\boldsymbol{I_5^u =}$
$\boldsymbol{\langle -2u^9+7u^8+\cdots+2b+6,\ -4u^9+14u^8+\cdots+6a+23,\ u^{10}-4u^9+\cdots-12u+3\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_5 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}\frac{2}{3}u^9 - \frac{7}{3}u^8 + \cdots + \frac{25}{3}u - \frac{23}{6}\\ u^9 - \frac{7}{2}u^8 + \cdots + 11u - 3\end{pmatrix}$$
$$a_8 = \begin{pmatrix}\frac{5}{3}u^9 - \frac{35}{6}u^8 + \cdots + \frac{58}{3}u - \frac{41}{6}\\ u^9 - \frac{7}{2}u^8 + \cdots + 11u - 3\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-1.11111u^9 + 3.44444u^8 + \cdots - 11.3889u + 3.83333\\ -\frac{1}{2}u^8 + \frac{3}{2}u^7 + \cdots + \frac{9}{2}u - 2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}\frac{2}{3}u^9 - \frac{17}{6}u^8 + \cdots + \frac{40}{3}u - \frac{19}{3}\\ \frac{1}{2}u^9 - \frac{3}{2}u^8 + \cdots - 5u^2 + 2u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-0.111111u^9 + 0.944444u^8 + \cdots - 6.38889u + 3.33333\\ -u^9 + 3u^8 + \cdots - \frac{15}{2}u + \frac{5}{2}\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.944444u^9 + 3.27778u^8 + \cdots - 13.0556u + 5.83333\\ -\frac{1}{2}u^9 + u^8 + \cdots - \frac{3}{2}u - \frac{1}{2}\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-0.888889u^9 + 2.77778u^8 + \cdots - 7.27778u + 2.44444\\ \frac{2}{3}u^9 - \frac{5}{3}u^8 + \cdots + \frac{17}{6}u - 1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{80}{9}u^9 - \frac{296}{9}u^8 + 66u^7 - \frac{838}{9}u^6 + \frac{1174}{9}u^5 - \frac{1504}{9}u^4 + \frac{1706}{9}u^3 - \frac{496}{3}u^2 + \frac{946}{9}u - \frac{112}{3}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$3(3u^{10} + 6u^9 - u^8 - 14u^7 - 8u^6 + 10u^5 + 11u^4 - 2u^3 - 5u^2 + 1)$
c_2, c_4	$u^{10} - 4u^9 + \cdots - 12u + 3$
c_3	$u^{10} - 7u^9 + \cdots - 96u + 32$
c_6, c_{10}	$3(3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1)$
c_7, c_9	$u^{10} + 4u^9 + \cdots + 12u + 3$
c_8	$u^{10} + 7u^9 + \cdots + 96u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_6 c_{10}	$9(9y^{10} - 42y^9 + \cdots - 10y + 1)$
c_2, c_4, c_7 c_9	$y^{10} + 2y^9 + 9y^8 + 18y^7 + 36y^6 + 48y^5 + 39y^4 + 22y^3 - 5y^2 - 6y + 9$
c_3, c_8	$y^{10} + 7y^9 + \cdots + 3584y + 1024$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.108840 + 1.043640I$ $a = 0.123214 + 0.540345I$ $b = 0.108840 - 1.043640I$	$0.806279I$	$0. - 8.22652I$
$u = 0.108840 - 1.043640I$ $a = 0.123214 - 0.540345I$ $b = 0.108840 + 1.043640I$	$-0.806279I$	$0. + 8.22652I$
$u = 0.724687 + 0.940396I$ $a = -0.069070 - 0.805418I$ $b = 0.684636 + 0.234182I$	$3.61397 + 2.21654I$	$5.38699 - 4.72022I$
$u = 0.724687 - 0.940396I$ $a = -0.069070 + 0.805418I$ $b = 0.684636 - 0.234182I$	$3.61397 - 2.21654I$	$5.38699 + 4.72022I$
$u = -0.719811 + 1.046890I$ $a = -1.000260 - 0.345304I$ $b = 1.20165 + 0.91842I$	$2.49243 + 8.64801I$	$4.04126 - 7.50135I$
$u = -0.719811 - 1.046890I$ $a = -1.000260 + 0.345304I$ $b = 1.20165 - 0.91842I$	$2.49243 - 8.64801I$	$4.04126 + 7.50135I$
$u = 0.684636 + 0.234182I$ $a = -1.359530 + 0.224163I$ $b = 0.724687 + 0.940396I$	$-3.61397 - 2.21654I$	$-5.38699 + 4.72022I$
$u = 0.684636 - 0.234182I$ $a = -1.359530 - 0.224163I$ $b = 0.724687 - 0.940396I$	$-3.61397 + 2.21654I$	$-5.38699 - 4.72022I$
$u = 1.20165 + 0.91842I$ $a = 0.472321 - 0.193135I$ $b = -0.719811 + 1.046890I$	$-2.49243 - 8.64801I$	$-4.04126 + 7.50135I$
$u = 1.20165 - 0.91842I$ $a = 0.472321 + 0.193135I$ $b = -0.719811 - 1.046890I$	$-2.49243 + 8.64801I$	$-4.04126 - 7.50135I$

VI.

$\boldsymbol{I^u_6 = \langle 5u^9 - 20u^8 + \cdots + 6b - 30,\ u^9 + 2u^8 + \cdots + 6a + 24,\ u^{10} - 4u^9 + \cdots - 12u + 3\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -\frac{1}{6}u^9 - \frac{1}{3}u^8 + \cdots + \frac{20}{3}u - 4 \\ -\frac{5}{6}u^9 + \frac{10}{3}u^8 + \cdots - \frac{79}{6}u + 5 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^9 + 3u^8 + \cdots - \frac{13}{2}u + 1 \\ -\frac{5}{6}u^9 + \frac{10}{3}u^8 + \cdots - \frac{79}{6}u + 5 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 2u^9 - \frac{13}{2}u^8 + \cdots + 22u - \frac{15}{2} \\ -\frac{1}{2}u^8 + \frac{3}{2}u^7 + \cdots + \frac{9}{2}u - 2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -\frac{2}{3}u^9 + \frac{5}{3}u^8 + \cdots - \frac{7}{3}u - 1 \\ -\frac{4}{3}u^9 + \frac{13}{3}u^8 + \cdots - \frac{85}{6}u + 5 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{7}{6}u^9 - \frac{8}{3}u^8 + \cdots + \frac{19}{3}u - \frac{1}{2} \\ \frac{5}{6}u^9 - \frac{10}{3}u^8 + \cdots + \frac{79}{6}u - 5 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{2}{3}u^9 - \frac{17}{6}u^8 + \cdots + \frac{40}{3}u - \frac{19}{3} \\ -u^9 + \frac{19}{6}u^8 + \cdots - \frac{19}{2}u + \frac{10}{3} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{2}u^8 + \frac{3}{2}u^7 + \cdots + 5u - 2 \\ \frac{1}{2}u^8 - \frac{3}{2}u^7 + \cdots - \frac{9}{2}u + 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= \frac{80}{9}u^9 - \frac{296}{9}u^8 + 66u^7 - \frac{838}{9}u^6 + \frac{1174}{9}u^5 - \frac{1504}{9}u^4 + \frac{1706}{9}u^3 - \frac{496}{3}u^2 + \frac{946}{9}u - \frac{112}{3}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^{10} + 4u^9 + \cdots + 12u + 3$
c_2, c_8	$3(3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1)$
c_3, c_7	$3(3u^{10} + 6u^9 - u^8 - 14u^7 - 8u^6 + 10u^5 + 11u^4 - 2u^3 - 5u^2 + 1)$
c_4, c_6	$u^{10} - 4u^9 + \cdots - 12u + 3$
c_5	$u^{10} - 7u^9 + \cdots - 96u + 32$
c_{10}	$u^{10} + 7u^9 + \cdots + 96u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_9	$y^{10} + 2y^9 + 9y^8 + 18y^7 + 36y^6 + 48y^5 + 39y^4 + 22y^3 - 5y^2 - 6y + 9$
c_2, c_3, c_7 c_8	$9(9y^{10} - 42y^9 + \cdots - 10y + 1)$
c_5, c_{10}	$y^{10} + 7y^9 + \cdots + 3584y + 1024$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.108840 + 1.043640I$ $a = 1.52900 + 0.39374I$ $b = -0.550514 - 0.187402I$	$0.806279I$	$0. - 8.22652I$
$u = 0.108840 - 1.043640I$ $a = 1.52900 - 0.39374I$ $b = -0.550514 + 0.187402I$	$-0.806279I$	$0. + 8.22652I$
$u = 0.724687 + 0.940396I$ $a = 0.475042 + 0.501279I$ $b = -0.983280 - 0.164908I$	$3.61397 + 2.21654I$	$5.38699 - 4.72022I$
$u = 0.724687 - 0.940396I$ $a = 0.475042 - 0.501279I$ $b = -0.983280 + 0.164908I$	$3.61397 - 2.21654I$	$5.38699 + 4.72022I$
$u = -0.719811 + 1.046890I$ $a = -0.804739 + 0.987238I$ $b = 0.744942 + 0.201707I$	$2.49243 + 8.64801I$	$4.04126 - 7.50135I$
$u = -0.719811 - 1.046890I$ $a = -0.804739 - 0.987238I$ $b = 0.744942 - 0.201707I$	$2.49243 - 8.64801I$	$4.04126 + 7.50135I$
$u = 0.684636 + 0.234182I$ $a = -2.07561 - 0.25693I$ $b = 0.707358 - 0.648629I$	$-3.61397 - 2.21654I$	$-5.38699 + 4.72022I$
$u = 0.684636 - 0.234182I$ $a = -2.07561 + 0.25693I$ $b = 0.707358 + 0.648629I$	$-3.61397 + 2.21654I$	$-5.38699 - 4.72022I$
$u = 1.20165 + 0.91842I$ $a = -1.123690 - 0.040350I$ $b = 1.081500 - 0.798609I$	$-2.49243 - 8.64801I$	$-4.04126 + 7.50135I$
$u = 1.20165 - 0.91842I$ $a = -1.123690 + 0.040350I$ $b = 1.081500 + 0.798609I$	$-2.49243 + 8.64801I$	$-4.04126 - 7.50135I$

VII. $I^u_7 = \langle -17u^9 - 123u^8 + \cdots + 144b - 496,\ u^9 + 21u^8 + \cdots + 96a + 416,\ u^{10} + 7u^9 + \cdots + 96u + 32 \rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.0104167u^9 - 0.218750u^8 + \cdots - 11.4167u - 4.33333 \\ 0.118056u^9 + 0.854167u^8 + \cdots + 11.2222u + 3.44444 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{31}{288}u^9 + \frac{61}{96}u^8 + \cdots - \frac{7}{36}u - \frac{8}{9} \\ 0.118056u^9 + 0.854167u^8 + \cdots + 11.2222u + 3.44444 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{48}u^9 - \frac{7}{48}u^8 + \cdots - \frac{23}{4}u - \frac{7}{3} \\ \frac{1}{24}u^8 + \frac{5}{24}u^7 + \cdots + \frac{4}{3}u - \frac{2}{3} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.0381944u^9 - 0.302083u^8 + \cdots - 3.52778u - 0.555556 \\ \frac{41}{144}u^9 + \frac{89}{48}u^8 + \cdots + \frac{71}{9}u + \frac{7}{9} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -\frac{1}{16}u^9 - \frac{7}{16}u^8 + \cdots - \frac{23}{4}u - 1 \\ \frac{1}{24}u^9 + \frac{1}{4}u^8 + \cdots + \frac{2}{3}u - \frac{2}{3} \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{1}{8}u^9 + \frac{11}{16}u^8 + \cdots + \frac{5}{2}u + \frac{1}{2} \\ -\frac{1}{16}u^9 - \frac{5}{16}u^8 + \cdots + \frac{5}{2}u + 2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0138889u^9 - 0.0208333u^8 + \cdots - 5.94444u - 1.38889 \\ 0.159722u^9 + 1.10417u^8 + \cdots + 8.38889u + 1.77778 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{4}{27}u^9 - \frac{11}{18}u^8 - \frac{173}{54}u^7 - \frac{331}{27}u^6 - \frac{1765}{54}u^5 - \frac{1103}{18}u^4 - \frac{4645}{54}u^3 - \frac{2239}{27}u^2 - \frac{1420}{27}u - \frac{554}{27}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$3(3u^{10} + 6u^9 - u^8 - 14u^7 - 8u^6 + 10u^5 + 11u^4 - 2u^3 - 5u^2 + 1)$
c_2, c_6	$3(3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1)$
c_3, c_5	$u^{10} + 4u^9 + \cdots + 12u + 3$
c_4	$u^{10} + 7u^9 + \cdots + 96u + 32$
c_8, c_{10}	$u^{10} - 4u^9 + \cdots - 12u + 3$
c_9	$u^{10} - 7u^9 + \cdots - 96u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_7	$9(9y^{10} - 42y^9 + \cdots - 10y + 1)$
c_3, c_5, c_8 c_{10}	$y^{10} + 2y^9 + 9y^8 + 18y^7 + 36y^6 + 48y^5 + 39y^4 + 22y^3 - 5y^2 - 6y + 9$
c_4, c_9	$y^{10} + 7y^9 + \cdots + 3584y + 1024$

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_7	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.127144 + 0.809997I$ $a = 0.99601 - 1.05102I$ $b = -0.983280 - 0.164908I$	$3.61397 + 2.21654I$	$5.38699 - 4.72022I$
$u = -0.127144 - 0.809997I$ $a = 0.99601 + 1.05102I$ $b = -0.983280 + 0.164908I$	$3.61397 - 2.21654I$	$5.38699 + 4.72022I$
$u = -1.36087 + 0.66197I$ $a = -0.474516 - 0.058738I$ $b = 0.707358 + 0.648629I$	$-3.61397 + 2.21654I$	$-5.38699 - 4.72022I$
$u = -1.36087 - 0.66197I$ $a = -0.474516 + 0.058738I$ $b = 0.707358 - 0.648629I$	$-3.61397 - 2.21654I$	$-5.38699 + 4.72022I$
$u = -0.45427 + 1.55310I$ $a = -0.496066 + 0.608563I$ $b = 0.744942 - 0.201707I$	$2.49243 - 8.64801I$	$4.04126 + 7.50135I$
$u = -0.45427 - 1.55310I$ $a = -0.496066 - 0.608563I$ $b = 0.744942 + 0.201707I$	$2.49243 + 8.64801I$	$4.04126 - 7.50135I$
$u = -0.24450 + 1.63857I$ $a = 0.613351 - 0.157946I$ $b = -0.550514 - 0.187402I$	$0.806279I$	$0. - 8.22652I$
$u = -0.24450 - 1.63857I$ $a = 0.613351 + 0.157946I$ $b = -0.550514 + 0.187402I$	$-\ 0.806279I$	$0. + 8.22652I$
$u = -1.31322 + 1.08050I$ $a = -0.888779 - 0.031915I$ $b = 1.081500 + 0.798609I$	$-2.49243 + 8.64801I$	$-4.04126 - 7.50135I$
$u = -1.31322 - 1.08050I$ $a = -0.888779 + 0.031915I$ $b = 1.081500 - 0.798609I$	$-2.49243 - 8.64801I$	$-4.04126 + 7.50135I$

VIII. $I^u_8 = \langle a^3u^2-2a^2u^2+\cdots-a+1,\ a^2u^2-u^2a+bu+au+b+a,\ u^3a^2-u^3a+au-u-1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_8^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$	0	0

IX. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_5 c_7, c_9	$9(u^4 - 3u^3 + \cdots - 2u + 1)(u^4 + u^3 - 2u - 1)(u^{10} - 7u^9 + \cdots - 96u + 32)$ $\cdot (u^{10} + 4u^9 + \cdots + 12u + 3)^2$ $\cdot (3u^{10} + 6u^9 - u^8 - 14u^7 - 8u^6 + 10u^5 + 11u^4 - 2u^3 - 5u^2 + 1)^2$
c_2, c_4, c_6 c_8, c_{10}	$9(u^4 - u^3 + 2u - 1)(u^4 + 3u^3 + 4u^2 + 2u + 1)$ $\cdot ((u^{10} - 4u^9 + \cdots - 12u + 3)^2)(u^{10} + 7u^9 + \cdots + 96u + 32)$ $\cdot (3u^{10} - 6u^9 - u^8 + 14u^7 - 8u^6 - 10u^5 + 11u^4 + 2u^3 - 5u^2 + 1)^2$

X. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_4, c_5, c_6 c_7, c_8, c_9 c_{10}	$81(y^4 - y^3 + 2y^2 - 4y + 1)(y^4 - y^3 + 6y^2 + 4y + 1)$ $\cdot (y^{10} + 2y^9 + 9y^8 + 18y^7 + 36y^6 + 48y^5 + 39y^4 + 22y^3 - 5y^2 - 6y + 9)^2$ $\cdot (y^{10} + 7y^9 + \cdots + 3584y + 1024)(9y^{10} - 42y^9 + \cdots - 10y + 1)^2$