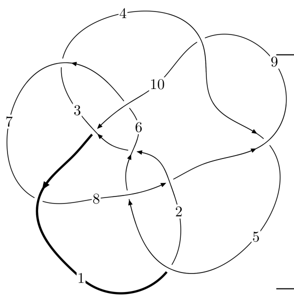
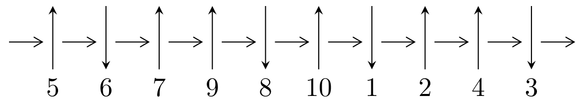
10_{122} $(K10a_{89})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^4 - u^3 - 4u^2 + 6b + u + 3,\ a + 1,\ u^5 + u^4 + u^3 - u^2 + 3u + 3\rangle$$
$$I_2^u = \langle u^9 - 3u^8 + 2u^7 - u^6 - u^5 - 8u^4 + u^3 - 5u^2 + 4b - u + 3,\ a + 1,\ u^{10} + u^8 + u^7 + 4u^6 + u^5 + u^4 - 2u^3 + 1\rangle$$
$$I_3^u = \langle 1.44071 \times 10^{22}u^{23} + 2.00575 \times 10^{22}u^{22} + \cdots + 8.55063 \times 10^{22}b + 4.63180 \times 10^{23},$$
$$6.78118 \times 10^{27}u^{23} + 1.02960 \times 10^{28}u^{22} + \cdots + 1.85674 \times 10^{28}a + 3.22471 \times 10^{29},\ u^{24} + u^{23} + \cdots - 26u + 6$$
$$I_4^u = \langle 118u^{11} - 136u^{10} + \cdots + 209b - 456,\ -142u^{11} - 116u^{10} + \cdots + 209a - 90,$$
$$u^{12} - u^{11} + 2u^{10} + u^9 + 2u^8 - 9u^7 + 3u^6 + 3u^5 + 2u^4 - 8u^3 + 8u^2 - 4u + 1\rangle$$
$$I_5^u = \langle u^5 + 2u^4 - 4u^3 + u^2 + 12b + 5u + 3,\ a + 1,\ u^6 - u^5 + 2u^4 + u^3 + 2u^2 + 3\rangle$$
$$I_6^u = \langle b + u + 1,\ a + 1,\ u^2 + u + 1\rangle$$
$$I_7^u = \langle b - 1,\ -3u^5 - 4u^4 - 6u^3 + 6u^2 + a - 7u + 1,\ u^6 + u^5 + 2u^4 - 2u^3 + 4u^2 - 2u + 1\rangle$$
$$I_8^u = \langle b,\ a + 1,\ u^3 - u^2 + 1\rangle$$

* 8 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 68 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. $I_1^u = \langle -u^4 - u^3 - 4u^2 + 6b + u + 3,\ a + 1,\ u^5 + u^4 + u^3 - u^2 + 3u + 3\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{17}{9}u^4 - \frac{7}{9}u^3 - \frac{28}{9}u^2 - \frac{35}{9}u + 7$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^5 - u^4 + u^3 + u^2 + 3u - 3$
c_2, c_7	$u^5 - 3u^3 + 7u - 4$
c_4, c_9	$3(3u^5 - 12u^4 + 26u^3 - 36u^2 + 28u - 8)$
c_5, c_{10}	$3(3u^5 - 15u^4 + 35u^3 - 41u^2 + 23u - 1)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^5 + y^4 + 9y^3 - y^2 + 15y - 9$
c_2, c_7	$y^5 - 6y^4 + 23y^3 - 42y^2 + 49y - 16$
c_4, c_9	$9(9y^5 + 12y^4 - 20y^3 - 32y^2 + 208y - 64)$
c_5, c_{10}	$9(9y^5 - 15y^4 + 133y^3 - 101y^2 + 447y - 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.860145 + 0.891716I$ $a = -1.00000$ $b = -1.30783 + 1.05747I$	$-1.64634 + 10.42060I$	$0.48885 - 9.54868I$
$u = \quad 0.860145 - 0.891716I$ $a = -1.00000$ $b = -1.30783 - 1.05747I$	$-1.64634 - 10.42060I$	$0.48885 + 9.54868I$
$u = -0.724026$ $a = -1.00000$ $b = -0.0473103$	1.11365	8.99900
$u = -0.99813 + 1.30502I$ $a = -1.00000$ $b = -1.16851 - 1.06085I$	$-7.9576 - 16.4108I$	$-1.98837 + 8.68093I$
$u = -0.99813 - 1.30502I$ $a = -1.00000$ $b = -1.16851 + 1.06085I$	$-7.9576 + 16.4108I$	$-1.98837 - 8.68093I$

II.

$$\boldsymbol{I_2^u = \langle u^9 - 3u^8 + \cdots + 4b + 3,\ a + 1,\ u^{10} + u^8 + u^7 + 4u^6 + u^5 + u^4 - 2u^3 + 1\rangle}$$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1 \\ -\frac{1}{4}u^9 + \frac{3}{4}u^8 + \cdots + \frac{1}{4}u - \frac{3}{4} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} \frac{1}{4}u^9 - \frac{3}{4}u^8 + \cdots - \frac{1}{4}u - \frac{1}{4} \\ -\frac{1}{4}u^9 + \frac{3}{4}u^8 + \cdots + \frac{1}{4}u - \frac{3}{4} \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{3}{4}u^9 - \frac{3}{4}u^8 + \cdots + \frac{5}{4}u + \frac{3}{4} \\ -\frac{3}{2}u^9 + u^8 + \cdots - \frac{1}{2}u - 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ \frac{3}{4}u^9 - \frac{1}{4}u^8 + \cdots + \frac{1}{4}u + \frac{1}{4} \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{4}u^9 - \frac{1}{4}u^8 + \cdots + \frac{1}{4}u + \frac{1}{4} \\ -\frac{3}{4}u^9 - \frac{1}{4}u^8 + \cdots + \frac{3}{4}u - \frac{3}{4} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{3}{2}u^9 - u^8 + \cdots + \frac{1}{2}u + 1 \\ -\frac{5}{4}u^9 + \frac{3}{4}u^8 + \cdots + \frac{5}{4}u - \frac{7}{4} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{4}u^9 - \frac{3}{4}u^8 + \cdots - \frac{1}{4}u - \frac{1}{4} \\ -\frac{1}{2}u^9 + \frac{1}{2}u^8 + \cdots + \frac{1}{2}u - \frac{3}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{1}{4}u^9 + \frac{5}{4}u^8 - \frac{5}{2}u^7 + \frac{5}{4}u^6 + \frac{11}{4}u^5 - \frac{9}{4}u^3 + \frac{15}{4}u^2 + \frac{25}{4}u + \frac{7}{4}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^{10} + u^8 - u^7 + 4u^6 - u^5 + u^4 + 2u^3 + 1$
c_2, c_7	$(u^5 - u^4 + 1)^2$
c_4, c_9	$(u^5 - 4u^4 + 9u^3 - 13u^2 + 10u - 4)^2$
c_5, c_{10}	$u^{10} - 10u^9 + \cdots - 95u + 19$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^{10} + 2y^9 + 9y^8 + 9y^7 + 16y^6 + 13y^5 + 7y^4 + 4y^3 + 2y^2 + 1$
c_2, c_7	$(y^5 - y^4 + 2y^2 - 1)^2$
c_4, c_9	$(y^5 + 2y^4 - 3y^3 - 21y^2 - 4y - 16)^2$
c_5, c_{10}	$y^{10} - 4y^9 + \cdots + 361y + 361$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.186488 + 0.884166I$ $a = -1.00000$ $b = -1.29181 + 1.28122I$	$-7.58413 - 7.68015I$	$-6.00758 + 6.55636I$
$u = -0.186488 - 0.884166I$ $a = -1.00000$ $b = -1.29181 - 1.28122I$	$-7.58413 + 7.68015I$	$-6.00758 - 6.55636I$
$u = -0.583652 + 0.627090I$ $a = -1.00000$ $b = -1.68130 - 0.73200I$	-1.88219	$-6 - 1.264578 + 0.10I$
$u = -0.583652 - 0.627090I$ $a = -1.00000$ $b = -1.68130 + 0.73200I$	-1.88219	$-6 - 1.264578 + 0.10I$
$u = -0.837561 + 0.788016I$ $a = -1.00000$ $b = -0.560268 - 0.657796I$	$1.94548 - 2.30273I$	$6.63987 + 2.99878I$
$u = -0.837561 - 0.788016I$ $a = -1.00000$ $b = -0.560268 + 0.657796I$	$1.94548 + 2.30273I$	$6.63987 - 2.99878I$
$u = \quad 0.656329 + 0.295939I$ $a = -1.00000$ $b = -0.297621 + 1.050690I$	$1.94548 - 2.30273I$	$6.63987 + 2.99878I$
$u = \quad 0.656329 - 0.295939I$ $a = -1.00000$ $b = -0.297621 - 1.050690I$	$1.94548 + 2.30273I$	$6.63987 - 2.99878I$
$u = \quad 0.95137 + 1.23664I$ $a = -1.00000$ $b = -1.169000 + 0.742016I$	$-7.58413 + 7.68015I$	$-6.00758 - 6.55636I$
$u = \quad 0.95137 - 1.23664I$ $a = -1.00000$ $b = -1.169000 - 0.742016I$	$-7.58413 - 7.68015I$	$-6.00758 + 6.55636I$

III. $I_3^u =$
$\langle 1.44\times10^{22}u^{23}+2.01\times10^{22}u^{22}+\cdots+8.55\times10^{22}b+4.63\times10^{23},\ 6.78\times10^{27}u^{23}+1.03\times10^{28}u^{22}+\cdots+1.86\times10^{28}a+3.22\times10^{29},\ u^{24}+u^{23}+\cdots-26u+67\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-0.365219u^{23}-0.554519u^{22}+\cdots-56.6942u-17.3675\\-0.168492u^{23}-0.234573u^{22}+\cdots-18.0977u-5.41691\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-0.196727u^{23}-0.319946u^{22}+\cdots-38.5965u-11.9506\\-0.168492u^{23}-0.234573u^{22}+\cdots-18.0977u-5.41691\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0.378827u^{23}+0.547263u^{22}+\cdots+70.2497u+31.8889\\0.0711438u^{23}+0.0997089u^{22}+\cdots+6.43136u+6.60068\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0.413307u^{23}+0.527233u^{22}+\cdots+69.0401u+33.4117\\-0.0366636u^{23}-0.119739u^{22}+\cdots-5.64098u-5.07784\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-0.531591u^{23}-1.06310u^{22}+\cdots-46.4641u-72.9977\\-0.0738408u^{23}-0.0393684u^{22}+\cdots-4.06916u+5.13154\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0.163715u^{23}+0.0132091u^{22}+\cdots+44.8521u-33.5831\\0.0580226u^{23}-0.0407545u^{22}+\cdots+14.5495u-11.8038\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-0.318510u^{23}-0.571602u^{22}+\cdots-58.1444u-24.6338\\-0.0998054u^{23}-0.191253u^{22}+\cdots-13.3096u-9.69092\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{4950750281840062033647188 8}{5542517349275444102159485 1}u^{23}-\frac{2566681692351432497367984 0}{5542517349275444102159485 1}u^{22}+\cdots-\frac{8454714591899753146209998108}{5542517349275444102159485 1}u+\frac{3209287438838954049727512794}{5542517349275444102159485 1}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^{24} - u^{23} + \cdots + 26u + 67$
c_2, c_7	$(u^{12} - u^{11} + \cdots - 24u + 19)^2$
c_4, c_9	$(u^3 + u^2 + 2u + 1)^8$
c_5, c_{10}	$(u^4 + u^3 - 2u + 1)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^{24} + 9y^{23} + \cdots + 68200y + 4489$
c_2, c_7	$(y^{12} - 13y^{11} + \cdots - 2096y + 361)^2$
c_4, c_9	$(y^3 + 3y^2 + 2y - 1)^8$
c_5, c_{10}	$(y^4 - y^3 + 6y^2 - 4y + 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.690412 + 0.835611I$ $a = 0.969409 + 0.292352I$ $b = 1.12196 - 1.05376I$	$-2.17641 + 4.05977I$	$-2.98049 - 6.92820I$
$u = 0.690412 - 0.835611I$ $a = 0.969409 - 0.292352I$ $b = 1.12196 + 1.05376I$	$-2.17641 - 4.05977I$	$-2.98049 + 6.92820I$
$u = -0.611027 + 0.676812I$ $a = -0.37068 + 1.40297I$ $b = -0.621964 - 0.187730I$	$-2.17641 - 4.05977I$	$-2.98049 + 6.92820I$
$u = -0.611027 - 0.676812I$ $a = -0.37068 - 1.40297I$ $b = -0.621964 + 0.187730I$	$-2.17641 + 4.05977I$	$-2.98049 - 6.92820I$
$u = -0.424999 + 1.011890I$ $a = 0.945558 + 0.285159I$ $b = 1.12196 + 1.05376I$	$-2.17641 - 4.05977I$	$-2.98049 + 6.92820I$
$u = -0.424999 - 1.011890I$ $a = 0.945558 - 0.285159I$ $b = 1.12196 - 1.05376I$	$-2.17641 + 4.05977I$	$-2.98049 - 6.92820I$
$u = 0.211529 + 0.854823I$ $a = -1.85383 + 1.20187I$ $b = -0.621964 + 0.187730I$	$-6.31400 + 1.23164I$	$-9.50976 - 3.94876I$
$u = 0.211529 - 0.854823I$ $a = -1.85383 - 1.20187I$ $b = -0.621964 - 0.187730I$	$-6.31400 - 1.23164I$	$-9.50976 + 3.94876I$
$u = -0.211301 + 1.222120I$ $a = 0.610648 - 0.042788I$ $b = 1.12196 - 1.05376I$	$-6.31400 + 1.23164I$	$-9.50976 - 3.94876I$
$u = -0.211301 - 1.222120I$ $a = 0.610648 + 0.042788I$ $b = 1.12196 + 1.05376I$	$-6.31400 - 1.23164I$	$-9.50976 + 3.94876I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.076739 + 0.755326I$ $a = 1.62960 - 0.11419I$ $b = 1.12196 + 1.05376I$	$-6.31400 - 1.23164I$	$-9.50976 + 3.94876I$
$u = 0.076739 - 0.755326I$ $a = 1.62960 + 0.11419I$ $b = 1.12196 - 1.05376I$	$-6.31400 + 1.23164I$	$-9.50976 - 3.94876I$
$u = 0.723053 + 1.108140I$ $a = -0.176034 - 0.666262I$ $b = -0.621964 - 0.187730I$	$-2.17641 - 4.05977I$	$-2.98049 + 6.92820I$
$u = 0.723053 - 1.108140I$ $a = -0.176034 + 0.666262I$ $b = -0.621964 + 0.187730I$	$-2.17641 + 4.05977I$	$-2.98049 - 6.92820I$
$u = 0.011192 + 0.596382I$ $a = -2.23288 - 3.23226I$ $b = -0.621964 + 0.187730I$	$-6.31400 + 6.88789I$	$-9.50976 - 9.90765I$
$u = 0.011192 - 0.596382I$ $a = -2.23288 + 3.23226I$ $b = -0.621964 - 0.187730I$	$-6.31400 - 6.88789I$	$-9.50976 + 9.90765I$
$u = 0.67325 + 1.26988I$ $a = 1.192260 - 0.277988I$ $b = 1.12196 - 1.05376I$	$-6.31400 + 6.88789I$	$-9.50976 - 9.90765I$
$u = 0.67325 - 1.26988I$ $a = 1.192260 + 0.277988I$ $b = 1.12196 + 1.05376I$	$-6.31400 - 6.88789I$	$-9.50976 + 9.90765I$
$u = -1.15569 + 1.32686I$ $a = 0.795498 - 0.185479I$ $b = 1.12196 + 1.05376I$	$-6.31400 - 6.88789I$	$-9.50976 + 9.90765I$
$u = -1.15569 - 1.32686I$ $a = 0.795498 + 0.185479I$ $b = 1.12196 - 1.05376I$	$-6.31400 + 6.88789I$	$-9.50976 - 9.90765I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.41952 + 1.33047I$ $a = -0.379792 - 0.246225I$ $b = -0.621964 + 0.187730I$	$-6.31400 + 1.23164I$	$-9.50976 - 3.94876I$
$u = 1.41952 - 1.33047I$ $a = -0.379792 + 0.246225I$ $b = -0.621964 - 0.187730I$	$-6.31400 - 1.23164I$	$-9.50976 + 3.94876I$
$u = -1.90267 + 1.36783I$ $a = -0.144680 + 0.209435I$ $b = -0.621964 + 0.187730I$	$-6.31400 + 6.88789I$	0
$u = -1.90267 - 1.36783I$ $a = -0.144680 - 0.209435I$ $b = -0.621964 - 0.187730I$	$-6.31400 - 6.88789I$	0

IV. $I_4^u = \langle 118u^{11} - 136u^{10} + \cdots + 209b - 456,\ -142u^{11} - 116u^{10} + \cdots + 209a - 90,\ u^{12} - u^{11} + \cdots - 4u + 1\rangle$

(i) Arc colorings

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

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

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

$$a_{10} = \begin{pmatrix} 0.679426u^{11} + 0.555024u^{10} + \cdots + 1.19139u + 0.430622 \\ -0.564593u^{11} + 0.650718u^{10} + \cdots - 4.52153u + 2.18182 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1.24402u^{11} - 0.0956938u^{10} + \cdots + 5.71292u - 1.75120 \\ -0.564593u^{11} + 0.650718u^{10} + \cdots - 4.52153u + 2.18182 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -4.11005u^{11} + 2.44976u^{10} + \cdots - 15.3349u + 4.11483 \\ 0.210526u^{11} - 0.578947u^{10} + \cdots + 1.84211u - 0.473684 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -3.77512u^{11} + 1.07177u^{10} + \cdots - 12.5742u + 2.60287 \\ 0.124402u^{11} - 0.799043u^{10} + \cdots + 2.91866u - 1.03828 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -1.77990u^{11} - 0.0574163u^{10} + \cdots - 4.54067u + 0.717703 \\ 2.27751u^{11} - 1.03349u^{10} + \cdots + 9.68900u - 3.50239 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -1.03349u^{11} + 1.56938u^{10} + \cdots - 10.1340u + 2.96172 \\ -1.32057u^{11} - 0.392344u^{10} + \cdots - 1.07177u + 0.114833 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.162679u^{11} + 0.344498u^{10} + \cdots + 1.45455u - 0.516746 \\ 0.172249u^{11} + 0.440191u^{10} + \cdots - 1.15311u + 1.12919 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{1120}{209}u^{11} + \frac{1572}{209}u^{10} - \frac{1784}{209}u^9 - \frac{296}{209}u^8 - \frac{144}{209}u^7 + \frac{13308}{209}u^6 - \frac{3548}{209}u^5 - \frac{7224}{209}u^4 - \frac{268}{19}u^3 + \frac{10060}{209}u^2 - \frac{9100}{209}u + \frac{4462}{209}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^{12} + u^{11} + \cdots + 4u + 1$
c_2, c_7	$u^{12} + 3u^{11} + \cdots + 30u + 7$
c_4, c_9	$(u^3 + u^2 + 2u + 1)^4$
c_5, c_{10}	$(u^2 + u + 1)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^{12} + 3y^{11} + \cdots + 4y^2 + 1$
c_2, c_7	$y^{12} + 7y^{11} + \cdots - 228y + 49$
c_4, c_9	$(y^3 + 3y^2 + 2y - 1)^4$
c_5, c_{10}	$(y^2 + y + 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_4	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.861381 + 0.168036I$ $a = -0.127543 + 0.669764I$ $b = 0.500000 + 0.866025I$	$-3.02413 - 1.23164I$	$2.49024 + 3.94876I$
$u = 0.861381 - 0.168036I$ $a = -0.127543 - 0.669764I$ $b = 0.500000 - 0.866025I$	$-3.02413 + 1.23164I$	$2.49024 - 3.94876I$
$u = -0.982330 + 0.603340I$ $a = 1.36153 - 0.93064I$ $b = 0.500000 + 0.866025I$	$-3.02413 - 6.88789I$	$2.49024 + 9.90765I$
$u = -0.982330 - 0.603340I$ $a = 1.36153 + 0.93064I$ $b = 0.500000 - 0.866025I$	$-3.02413 + 6.88789I$	$2.49024 - 9.90765I$
$u = 0.514136 + 0.376971I$ $a = 2.08379 + 0.47689I$ $b = 0.500000 - 0.866025I$	$1.11345 + 4.05977I$	$9.01951 - 6.92820I$
$u = 0.514136 - 0.376971I$ $a = 2.08379 - 0.47689I$ $b = 0.500000 + 0.866025I$	$1.11345 - 4.05977I$	$9.01951 + 6.92820I$
$u = -0.891575 + 1.030720I$ $a = 0.456012 + 0.104362I$ $b = 0.500000 + 0.866025I$	$1.11345 - 4.05977I$	$9.01951 + 6.92820I$
$u = -0.891575 - 1.030720I$ $a = 0.456012 - 0.104362I$ $b = 0.500000 - 0.866025I$	$1.11345 + 4.05977I$	$9.01951 - 6.92820I$
$u = 0.222408 + 0.555490I$ $a = -0.27437 + 1.44082I$ $b = 0.500000 - 0.866025I$	$-3.02413 + 1.23164I$	$2.49024 - 3.94876I$
$u = 0.222408 - 0.555490I$ $a = -0.27437 - 1.44082I$ $b = 0.500000 + 0.866025I$	$-3.02413 - 1.23164I$	$2.49024 + 3.94876I$

	Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$0.77598 + 1.73565I$		
$a =$	$0.500591 - 0.342166I$	$-3.02413 + 6.88789I$	$2.49024 - 9.90765I$
$b =$	$0.500000 - 0.866025I$		
$u =$	$0.77598 - 1.73565I$		
$a =$	$0.500591 + 0.342166I$	$-3.02413 - 6.88789I$	$2.49024 + 9.90765I$
$b =$	$0.500000 + 0.866025I$		

V.

$\boldsymbol{I^u_5 = \langle u^5 + 2u^4 - 4u^3 + u^2 + 12b + 5u + 3,\ a + 1,\ u^6 - u^5 + 2u^4 + u^3 + 2u^2 + 3\rangle}$

(i) Arc colorings

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

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

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

$$a_{10} = \begin{pmatrix} -1 \\ -\frac{1}{12}u^5 - \frac{1}{6}u^4 + \cdots - \frac{5}{12}u - \frac{1}{4} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{12}u^5 + \frac{1}{6}u^4 + \cdots + \frac{5}{12}u - \frac{3}{4} \\ -\frac{1}{12}u^5 - \frac{1}{6}u^4 + \cdots - \frac{5}{12}u - \frac{1}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{1}{12}u^5 - \frac{1}{3}u^4 + \cdots - \frac{7}{12}u + \frac{3}{4} \\ \frac{1}{6}u^5 - \frac{1}{6}u^4 + \cdots + \frac{5}{6}u - 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ -\frac{1}{4}u^5 + \frac{1}{2}u^4 + \cdots + \frac{3}{4}u + \frac{1}{4} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{4}u^5 + \frac{1}{2}u^4 + \cdots + \frac{1}{4}u + \frac{7}{4} \\ -\frac{1}{4}u^5 + \frac{1}{2}u^3 + \cdots + \frac{3}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{6}u^5 - \frac{1}{6}u^4 + \cdots - \frac{1}{6}u - \frac{2}{3} \\ -\frac{5}{12}u^5 + \frac{1}{2}u^4 + \cdots - \frac{3}{4}u + \frac{5}{12} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{1}{12}u^5 + \frac{1}{6}u^4 + \cdots + \frac{5}{12}u - \frac{3}{4} \\ \frac{1}{6}u^5 - \frac{2}{3}u^4 + \cdots - \frac{1}{6}u + \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{3}{4}u^5 - u^4 - \frac{1}{2}u^3 + \frac{5}{4}u^2 - \frac{9}{4}u - \frac{17}{4}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$u^6 - u^5 + 2u^4 + u^3 + 2u^2 + 3$
c_2, c_7	$(u^3 + 2u^2 + u - 1)^2$
c_4, c_9	$3(3u^6 + 14u^4 + 23u^2 + 13)$
c_5, c_{10}	$3(3u^6 - 9u^5 + 11u^4 - 3u^3 - 3u^2 + u + 1)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^6 + 3y^5 + 10y^4 + 13y^3 + 16y^2 + 12y + 9$
c_2, c_7	$(y^3 - 2y^2 + 5y - 1)^2$
c_4, c_9	$9(3y^3 + 14y^2 + 23y + 13)^2$
c_5, c_{10}	$9(9y^6 - 15y^5 + 49y^4 - 51y^3 + 37y^2 - 7y + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.783974 + 0.693760I$ $a = -1.00000$ $b = \ \ 0.383600 + 0.213445I$	$-5.55560 + 6.33267I$	$-0.64281 - 3.53920I$
$u = -0.783974 - 0.693760I$ $a = -1.00000$ $b = \ \ 0.383600 - 0.213445I$	$-5.55560 - 6.33267I$	$-0.64281 + 3.53920I$
$u = \ \ 0.391622 + 0.997262I$ $a = -1.00000$ $b = -0.841164 - 0.404475I$	-5.33814	$-4.71439 + 0.I$
$u = \ \ 0.391622 - 0.997262I$ $a = -1.00000$ $b = -0.841164 + 0.404475I$	-5.33814	$-4.71439 + 0.I$
$u = \ \ 0.89235 + 1.26033I$ $a = -1.00000$ $b = -1.042440 + 0.948097I$	$-5.55560 + 6.33267I$	$-0.64281 - 3.53920I$
$u = \ \ 0.89235 - 1.26033I$ $a = -1.00000$ $b = -1.042440 - 0.948097I$	$-5.55560 - 6.33267I$	$-0.64281 + 3.53920I$

VI. $\boldsymbol{I_6^u = \langle b + u + 1,\ a + 1,\ u^2 + u + 1 \rangle}$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -1 \\ -u - 1 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ u + 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -1 \\ -u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 8u + 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = -1.00000$ $b = -0.500000 - 0.866025I$	$-4.05977I$	$0. + 6.92820I$
$u = -0.500000 - 0.866025I$ $a = -1.00000$ $b = -0.500000 + 0.866025I$	$4.05977I$	$0. - 6.92820I$

VII.

$$\boldsymbol{I^u_7 = \langle b-1,\ -3u^5-4u^4-6u^3+6u^2+a-7u+1,\ u^6+u^5+2u^4-2u^3+4u^2-2u+1\rangle}$$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^5+20u^2-16u+6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$y^6 + 3y^5 + 16y^4 + 18y^3 + 12y^2 + 4y + 1$
c_2, c_7	$(y^3 - y^2 + 2y - 1)^2$
c_4, c_9	$(y^3 + 3y^2 + 2y - 1)^2$
c_5, c_{10}	$(y - 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_7	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.288915 + 0.750335I$ $a = 2.25666 - 0.68552I$ $b = 1.00000$	$-6.31400 + 2.82812I$	$-9.50976 - 2.97945I$
$u = 0.288915 - 0.750335I$ $a = 2.25666 + 0.68552I$ $b = 1.00000$	$-6.31400 - 2.82812I$	$-9.50976 + 2.97945I$
$u = 0.377439 + 0.536376I$ $a = 0.337641 + 0.941275I$ $b = 1.00000$	-2.17641	$-2.98049 + 0.I$
$u = 0.377439 - 0.536376I$ $a = 0.337641 - 0.941275I$ $b = 1.00000$	-2.17641	$-2.98049 + 0.I$
$u = -1.16635 + 1.49520I$ $a = 0.405695 - 0.123240I$ $b = 1.00000$	$-6.31400 - 2.82812I$	$-9.50976 + 2.97945I$
$u = -1.16635 - 1.49520I$ $a = 0.405695 + 0.123240I$ $b = 1.00000$	$-6.31400 + 2.82812I$	$-9.50976 - 2.97945I$

VIII. $I_8^u = \langle b,\ a+1,\ u^3 - u^2 + 1 \rangle$

(i) Arc colorings

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

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

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

$$a_{10} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

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

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

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

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

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

$$a_9 = \begin{pmatrix} u^2 - 1 \\ -u^2 + u + 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u + 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_8^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.877439 + 0.744862I$ $a = -1.00000$ $b = 0$	$-3.02413 + 2.82812I$	$2.49024 - 2.97945I$
$u = 0.877439 - 0.744862I$ $a = -1.00000$ $b = 0$	$-3.02413 - 2.82812I$	$2.49024 + 2.97945I$
$u = -0.754878$ $a = -1.00000$ $b = 0$	1.11345	9.01950

IX. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_6 c_8	$(u^2+u+1)(u^3+u^2-1)(u^5-u^4+u^3+u^2+3u-3)$ $\cdot(u^6-u^5+2u^4+u^3+2u^2+3)(u^6-u^5+2u^4+2u^3+4u^2+2u+1)$ $\cdot(u^{10}+u^8+\cdots+2u^3+1)(u^{12}+u^{11}+\cdots+4u+1)$ $\cdot(u^{24}-u^{23}+\cdots+26u+67)$
c_2, c_7	$(u^2-u+1)(u^3-u^2+1)^2(u^3+u^2-1)(u^3+2u^2+u-1)^2$ $\cdot(u^5-3u^3+7u-4)(u^5-u^4+1)^2(u^{12}-u^{11}+\cdots-24u+19)^2$ $\cdot(u^{12}+3u^{11}+\cdots+30u+7)$
c_4, c_9	$9u^2(u^3-u^2+2u-1)(u^3+u^2+2u+1)^{14}$ $\cdot(u^5-4u^4+9u^3-13u^2+10u-4)^2$ $\cdot(3u^5-12u^4+26u^3-36u^2+28u-8)(3u^6+14u^4+23u^2+13)$
c_5, c_{10}	$9u^3(u+1)^6(u^2-u+1)(u^2+u+1)^6(u^4+u^3-2u+1)^6$ $\cdot(3u^5-15u^4+35u^3-41u^2+23u-1)$ $\cdot(3u^6-9u^5+\cdots+u+1)(u^{10}-10u^9+\cdots-95u+19)$

X. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_8	$(y^2+y+1)(y^3-y^2+2y-1)(y^5+y^4+9y^3-y^2+15y-9)$ $\cdot (y^6+3y^5+10y^4+13y^3+16y^2+12y+9)$ $\cdot (y^6+3y^5+16y^4+18y^3+12y^2+4y+1)$ $\cdot (y^{10}+2y^9+9y^8+9y^7+16y^6+13y^5+7y^4+4y^3+2y^2+1)$ $\cdot (y^{12}+3y^{11}+\cdots+4y^2+1)(y^{24}+9y^{23}+\cdots+68200y+4489)$
c_2, c_7	$(y^2+y+1)(y^3-2y^2+5y-1)^2(y^3-y^2+2y-1)^3$ $\cdot (y^5-6y^4+23y^3-42y^2+49y-16)(y^5-y^4+2y^2-1)^2$ $\cdot ((y^{12}-13y^{11}+\cdots-2096y+361)^2)(y^{12}+7y^{11}+\cdots-228y+49)$
c_4, c_9	$81y^2(y^3+3y^2+2y-1)^{15}(3y^3+14y^2+23y+13)^2$ $\cdot (y^5+2y^4-3y^3-21y^2-4y-16)^2$ $\cdot (9y^5+12y^4-20y^3-32y^2+208y-64)$
c_5, c_{10}	$81y^3(y-1)^6(y^2+y+1)^7(y^4-y^3+6y^2-4y+1)^6$ $\cdot (9y^5-15y^4+133y^3-101y^2+447y-1)$ $\cdot (9y^6-15y^5+49y^4-51y^3+37y^2-7y+1)$ $\cdot (y^{10}-4y^9+\cdots+361y+361)$