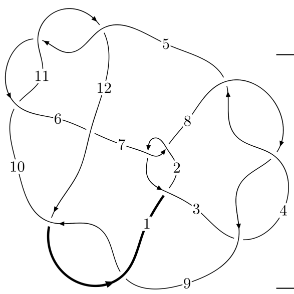
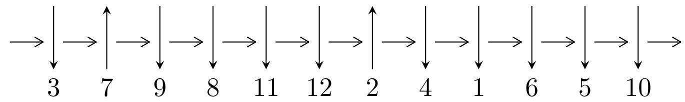
$12a_{0564}$ ($K12a_{0564}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -u^{53} + 4u^{52} + \cdots + 4b + 4,\ 2u^{55} - 4u^{54} + \cdots + 4a - 12,\ u^{56} - 2u^{55} + \cdots - 5u + 2 \rangle \\
I_2^u &= \langle a^2u^2 + 2u^2a + 2a^2 - 2u^2 + b + 4a - 4,\ 2a^2u^2 + a^3 + 2u^2a + 4a^2 + au - 2u^2 + 2a - u - 4,\ u^3 + 2u - 1 \rangle \\
I_3^u &= \langle -u^8 + u^7 - 4u^6 + 3u^5 - 4u^4 + 2u^3 + b - u - 1,\ -u^9 - 5u^7 - 8u^5 - 3u^3 + a + u, \\
&\qquad u^{10} + 5u^8 + 8u^6 + 3u^4 - u^2 + 1 \rangle \\
I_4^u &= \langle 3a^2u^2 - 2u^3a + 4a^2u - 2u^2a + 2u^3 + 2a^2 - 2au + 2u^2 + b + 2u, \\
&\qquad -2u^3a^2 - 2a^2u^2 + 8u^3a + a^3 - 4a^2u + 3u^2a - 2u^3 - 4a^2 + 13au - u^2 + 8a - 3u - 2, \\
&\qquad u^4 + u^3 + 2u^2 + 2u + 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 87 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. $I_1^u =$
$\langle -u^{53}+4u^{52}+\cdots+4b+4,\ 2u^{55}-4u^{54}+\cdots+4a-12,\ u^{56}-2u^{55}+\cdots-5u+2\rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ u^3+u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -\frac{1}{2}u^{55}+u^{54}+\cdots-\frac{7}{4}u+3 \\ \frac{1}{4}u^{53}-u^{52}+\cdots+\frac{3}{2}u-1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^3-2u \\ u^3+u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} \frac{1}{4}u^{51}+6u^{49}+\cdots+\frac{5}{4}u+1 \\ -\frac{1}{4}u^{53}-\frac{25}{4}u^{51}+\cdots+\frac{1}{2}u^2+\frac{1}{2}u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -\frac{1}{4}u^{55}-\frac{13}{2}u^{53}+\cdots-\frac{1}{4}u-1 \\ \frac{3}{4}u^{55}-u^{54}+\cdots+\frac{5}{2}u-1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{1}{4}u^{44}+\frac{21}{4}u^{42}+\cdots+\frac{1}{2}u+\frac{1}{2} \\ -\frac{1}{4}u^{44}-5u^{42}+\cdots-\frac{3}{4}u^2+u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^2+1 \\ -u^4-2u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^6-3u^4-2u^2+1 \\ u^8+4u^6+4u^4 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^{10}+5u^8+8u^6+3u^4-u^2+1 \\ -u^{12}-6u^{10}-12u^8-8u^6-u^4-2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^{55}-4u^{54}+\cdots+20u-10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{56} + 19u^{55} + \cdots - 20u + 1$
c_2, c_7	$u^{56} + u^{55} + \cdots - 10u^2 + 1$
c_3, c_4, c_8	$u^{56} + u^{55} + \cdots + 2u + 1$
c_5, c_{10}, c_{11}	$u^{56} + 2u^{55} + \cdots + 5u + 2$
c_6	$u^{56} - 2u^{55} + \cdots - 231u + 202$
c_9, c_{12}	$u^{56} - 8u^{55} + \cdots - 1317u + 136$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{56} + 47y^{55} + \cdots + 1224y + 1$
c_2, c_7	$y^{56} + 19y^{55} + \cdots - 20y + 1$
c_3, c_4, c_8	$y^{56} + 63y^{55} + \cdots - 84y + 1$
c_5, c_{10}, c_{11}	$y^{56} + 52y^{55} + \cdots + 19y + 4$
c_6	$y^{56} + 20y^{55} + \cdots + 498907y + 40804$
c_9, c_{12}	$y^{56} + 48y^{55} + \cdots - 423177y + 18496$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.167031 + 1.023460I$ $a = 0.581239 + 0.389226I$ $b = 0.786716 - 0.931788I$	$4.78319 + 2.48153I$	$-3.50379 - 2.32484I$
$u = 0.167031 - 1.023460I$ $a = 0.581239 - 0.389226I$ $b = 0.786716 + 0.931788I$	$4.78319 - 2.48153I$	$-3.50379 + 2.32484I$
$u = 0.692071 + 0.437803I$ $a = -0.66383 - 2.04682I$ $b = -0.37969 + 1.48563I$	$10.54030 - 5.20317I$	$-1.76462 + 3.90235I$
$u = 0.692071 - 0.437803I$ $a = -0.66383 + 2.04682I$ $b = -0.37969 - 1.48563I$	$10.54030 + 5.20317I$	$-1.76462 - 3.90235I$
$u = -0.708508 + 0.410403I$ $a = 1.96906 - 2.08951I$ $b = -1.10648 + 2.12776I$	$8.5419 + 11.5420I$	$-4.16165 - 8.13234I$
$u = -0.708508 - 0.410403I$ $a = 1.96906 + 2.08951I$ $b = -1.10648 - 2.12776I$	$8.5419 - 11.5420I$	$-4.16165 + 8.13234I$
$u = 0.622613 + 0.525563I$ $a = 1.77821 + 0.87570I$ $b = -0.85453 - 1.37150I$	$10.86790 + 0.81891I$	$-1.02610 + 2.14303I$
$u = 0.622613 - 0.525563I$ $a = 1.77821 - 0.87570I$ $b = -0.85453 + 1.37150I$	$10.86790 - 0.81891I$	$-1.02610 - 2.14303I$
$u = -0.592033 + 0.557273I$ $a = -1.57209 + 2.23463I$ $b = -0.22451 - 1.53219I$	$9.08740 - 7.17759I$	$-2.84487 + 2.35339I$
$u = -0.592033 - 0.557273I$ $a = -1.57209 - 2.23463I$ $b = -0.22451 + 1.53219I$	$9.08740 + 7.17759I$	$-2.84487 - 2.35339I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.103142 + 1.185330I$ $a = 0.186061 - 0.410343I$ $b = 1.46690 + 0.65983I$	$-0.051945 - 0.385761I$	0
$u = -0.103142 - 1.185330I$ $a = 0.186061 + 0.410343I$ $b = 1.46690 - 0.65983I$	$-0.051945 + 0.385761I$	0
$u = 0.669252 + 0.412330I$ $a = 2.47043 + 1.87049I$ $b = -1.39269 - 1.97696I$	$2.26755 - 7.24573I$	$-6.66677 + 8.30952I$
$u = 0.669252 - 0.412330I$ $a = 2.47043 - 1.87049I$ $b = -1.39269 + 1.97696I$	$2.26755 + 7.24573I$	$-6.66677 - 8.30952I$
$u = -0.206699 + 0.752355I$ $a = 0.574163 - 0.045388I$ $b = 0.468649 - 0.514420I$	$4.95627 + 2.53829I$	$-2.18457 - 3.78654I$
$u = -0.206699 - 0.752355I$ $a = 0.574163 + 0.045388I$ $b = 0.468649 + 0.514420I$	$4.95627 - 2.53829I$	$-2.18457 + 3.78654I$
$u = 0.582613 + 0.498044I$ $a = -1.36009 - 2.66583I$ $b = -0.26540 + 1.65618I$	$2.62946 + 3.09884I$	$-5.44089 - 2.20028I$
$u = 0.582613 - 0.498044I$ $a = -1.36009 + 2.66583I$ $b = -0.26540 - 1.65618I$	$2.62946 - 3.09884I$	$-5.44089 + 2.20028I$
$u = -0.676046 + 0.203719I$ $a = 0.329443 + 0.139721I$ $b = 0.294607 - 0.292968I$	$3.00074 + 0.91231I$	$-5.60324 - 1.33604I$
$u = -0.676046 - 0.203719I$ $a = 0.329443 - 0.139721I$ $b = 0.294607 + 0.292968I$	$3.00074 - 0.91231I$	$-5.60324 + 1.33604I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.692318 + 0.121292I$ $a = -0.85392 - 1.33610I$ $b = 0.25519 + 1.45796I$	$2.08625 - 5.88981I$	$-8.03014 + 6.36741I$
$u = 0.692318 - 0.121292I$ $a = -0.85392 + 1.33610I$ $b = 0.25519 - 1.45796I$	$2.08625 + 5.88981I$	$-8.03014 - 6.36741I$
$u = -0.201418 + 1.293670I$ $a = -0.870058 - 0.579976I$ $b = -0.43169 - 1.56082I$	$1.14651 + 5.97963I$	0
$u = -0.201418 - 1.293670I$ $a = -0.870058 + 0.579976I$ $b = -0.43169 + 1.56082I$	$1.14651 - 5.97963I$	0
$u = 0.261428 + 1.299180I$ $a = -1.039600 + 0.218945I$ $b = -0.49696 + 1.44809I$	$6.50957 - 9.34599I$	0
$u = 0.261428 - 1.299180I$ $a = -1.039600 - 0.218945I$ $b = -0.49696 - 1.44809I$	$6.50957 + 9.34599I$	0
$u = 0.580660 + 0.311133I$ $a = 0.0703685 - 0.0523659I$ $b = 0.409701 + 0.523982I$	$-1.38214 - 1.50697I$	$-13.53047 + 3.87884I$
$u = 0.580660 - 0.311133I$ $a = 0.0703685 + 0.0523659I$ $b = 0.409701 - 0.523982I$	$-1.38214 + 1.50697I$	$-13.53047 - 3.87884I$
$u = -0.008074 + 1.347070I$ $a = 0.668271 + 0.576392I$ $b = 0.353028 + 0.821443I$	$4.43635 - 1.45929I$	0
$u = -0.008074 - 1.347070I$ $a = 0.668271 - 0.576392I$ $b = 0.353028 - 0.821443I$	$4.43635 + 1.45929I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.521433 + 0.341179I$ $a = 1.33055 + 0.94373I$ $b = -0.774976 - 0.280233I$	$2.02037 + 1.59760I$	$-0.90500 - 4.85866I$
$u = -0.521433 - 0.341179I$ $a = 1.33055 - 0.94373I$ $b = -0.774976 + 0.280233I$	$2.02037 - 1.59760I$	$-0.90500 + 4.85866I$
$u = -0.246474 + 1.358800I$ $a = 0.252006 + 0.237582I$ $b = -0.157937 - 0.612956I$	$7.93137 + 4.24929I$	0
$u = -0.246474 - 1.358800I$ $a = 0.252006 - 0.237582I$ $b = -0.157937 + 0.612956I$	$7.93137 - 4.24929I$	0
$u = -0.604464 + 0.090171I$ $a = -1.22485 + 0.96150I$ $b = 0.55744 - 1.31425I$	$-3.13696 + 3.05067I$	$-15.3053 - 6.1769I$
$u = -0.604464 - 0.090171I$ $a = -1.22485 - 0.96150I$ $b = 0.55744 + 1.31425I$	$-3.13696 - 3.05067I$	$-15.3053 + 6.1769I$
$u = -0.20414 + 1.41040I$ $a = 0.154106 + 0.721195I$ $b = -1.068550 - 0.531298I$	$7.58921 + 4.29042I$	0
$u = -0.20414 - 1.41040I$ $a = 0.154106 - 0.721195I$ $b = -1.068550 + 0.531298I$	$7.58921 - 4.29042I$	0
$u = 0.22437 + 1.42514I$ $a = 0.0464407 - 0.0037704I$ $b = -0.198621 + 1.070760I$	$4.20552 - 4.47801I$	0
$u = 0.22437 - 1.42514I$ $a = 0.0464407 + 0.0037704I$ $b = -0.198621 - 1.070760I$	$4.20552 + 4.47801I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.02481 + 1.45160I$ $a = 0.437034 - 0.432649I$ $b = -0.071252 - 1.121650I$	$11.67150 + 3.02727I$	0
$u = -0.02481 - 1.45160I$ $a = 0.437034 + 0.432649I$ $b = -0.071252 + 1.121650I$	$11.67150 - 3.02727I$	0
$u = 0.24729 + 1.46542I$ $a = 1.75227 - 0.41488I$ $b = -1.92961 - 2.80986I$	$8.32154 - 10.59610I$	0
$u = 0.24729 - 1.46542I$ $a = 1.75227 + 0.41488I$ $b = -1.92961 + 2.80986I$	$8.32154 + 10.59610I$	0
$u = 0.20280 + 1.47543I$ $a = -1.64369 - 0.44402I$ $b = 0.68333 + 2.27056I$	$8.98647 + 0.24581I$	0
$u = 0.20280 - 1.47543I$ $a = -1.64369 + 0.44402I$ $b = 0.68333 - 2.27056I$	$8.98647 - 0.24581I$	0
$u = -0.26313 + 1.47028I$ $a = 1.68249 + 0.12616I$ $b = -1.40694 + 2.97582I$	$14.6067 + 15.0877I$	0
$u = -0.26313 - 1.47028I$ $a = 1.68249 - 0.12616I$ $b = -1.40694 - 2.97582I$	$14.6067 - 15.0877I$	0
$u = 0.25179 + 1.47848I$ $a = -1.236920 - 0.501404I$ $b = -0.07447 + 1.78181I$	$16.7327 - 8.6480I$	0
$u = 0.25179 - 1.47848I$ $a = -1.236920 + 0.501404I$ $b = -0.07447 - 1.78181I$	$16.7327 + 8.6480I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.18754 + 1.49529I$ $a = -1.54445 + 0.24504I$ $b = 0.90159 - 1.78028I$	$15.7506 - 4.3922I$	0
$u = -0.18754 - 1.49529I$ $a = -1.54445 - 0.24504I$ $b = 0.90159 + 1.78028I$	$15.7506 + 4.3922I$	0
$u = 0.20634 + 1.49448I$ $a = 1.075950 - 0.501942I$ $b = -1.36447 - 1.63496I$	$17.4257 - 2.1759I$	0
$u = 0.20634 - 1.49448I$ $a = 1.075950 + 0.501942I$ $b = -1.36447 + 1.63496I$	$17.4257 + 2.1759I$	0
$u = 0.147340 + 0.378273I$ $a = 0.901441 + 0.594340I$ $b = 0.521618 + 0.321445I$	$-0.581405 - 1.167200I$	$-7.43245 + 5.35431I$
$u = 0.147340 - 0.378273I$ $a = 0.901441 - 0.594340I$ $b = 0.521618 - 0.321445I$	$-0.581405 + 1.167200I$	$-7.43245 - 5.35431I$

II.
$\boldsymbol{I^u_2 = \langle a^2u^2+2u^2a+2a^2-2u^2+b+4a-4,\ 2a^2u^2+2u^2a+\cdots+2a-4,\ u^3+2u-1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^2-4u-10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^9 + 6u^8 + 15u^7 + 24u^6 + 31u^5 + 30u^4 + 21u^3 + 12u^2 + 4u - 1$
c_2, c_3, c_4 c_7, c_8	$u^9 + 3u^7 + 3u^5 + 3u^3 + 2u + 1$
c_5, c_9, c_{10} c_{11}, c_{12}	$(u^3 + 2u + 1)^3$
c_6	$(u^3 + 3u^2 + 5u + 2)^3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^9 - 6y^8 - y^7 + 36y^6 + 15y^5 - 42y^4 + 17y^3 + 84y^2 + 40y - 1$
c_2, c_3, c_4 c_7, c_8	$y^9 + 6y^8 + 15y^7 + 24y^6 + 31y^5 + 30y^4 + 21y^3 + 12y^2 + 4y - 1$
c_5, c_9, c_{10} c_{11}, c_{12}	$(y^3 + 4y^2 + 4y - 1)^3$
c_6	$(y^3 + y^2 + 13y - 4)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.22670+1.46771I$ $a=-1.41033+0.65322I$ $b=\ \ 0.02182-2.22338I$	$9.44074+5.13794I$	$-0.68207-3.20902I$
$u=-0.22670+1.46771I$ $a=\ \ 1.44687+0.73836I$ $b=-2.15352+1.99644I$	$9.44074+5.13794I$	$-0.68207-3.20902I$
$u=-0.22670+1.46771I$ $a=\ \ 0.169027-0.060668I$ $b=-0.073872-1.103970I$	$9.44074+5.13794I$	$-0.68207-3.20902I$
$u=-0.22670-1.46771I$ $a=-1.41033-0.65322I$ $b=\ \ 0.02182+2.22338I$	$9.44074-5.13794I$	$-0.68207+3.20902I$
$u=-0.22670-1.46771I$ $a=\ \ 1.44687-0.73836I$ $b=-2.15352-1.99644I$	$9.44074-5.13794I$	$-0.68207+3.20902I$
$u=-0.22670-1.46771I$ $a=\ \ 0.169027+0.060668I$ $b=-0.073872+1.103970I$	$9.44074-5.13794I$	$-0.68207+3.20902I$
$u=\ \ 0.453398$ $a=\ \ 0.733086$ $b=-0.00791217$	-0.787199	-12.6360
$u=\ \ 0.453398$ $a=-2.57211+0.14119I$ $b=\ \ 1.20953+0.97910I$	-0.787199	-12.6360
$u=\ \ 0.453398$ $a=-2.57211-0.14119I$ $b=\ \ 1.20953-0.97910I$	-0.787199	-12.6360

III. $\boldsymbol{I_3^u = \langle -u^8 + u^7 - 4u^6 + 3u^5 - 4u^4 + 2u^3 + b - u - 1,\ -u^9 - 5u^7 - 8u^5 - 3u^3 + a + u,\ u^{10} + 5u^8 + 8u^6 + 3u^4 - u^2 + 1\rangle}$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

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

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

$$a_2 = \begin{pmatrix} u^9 + 5u^7 - u^6 + 8u^5 - 3u^4 + 3u^3 - 2u^2 - u + 1 \\ 2u^8 - u^7 + 8u^6 - 3u^5 + 8u^4 - 2u^3 + u + 1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} u^9 + 5u^7 + 8u^5 + 3u^3 - u \\ u^8 - u^7 + 4u^6 - 3u^5 + 4u^4 - 2u^3 + 2u + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^6 - 3u^4 - 2u^2 + 1 \\ u^8 + 4u^6 + 4u^4 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ u^8 + 3u^6 + u^4 - 2u^2 + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^6 + 12u^4 + 8u^2 - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.217740I$ $a = 0.821196I$ $b = 1.58802 + 0.76683I$	2.40108	-6.51890
$u = -1.217740I$ $a = -0.821196I$ $b = 1.58802 - 0.76683I$	2.40108	-6.51890
$u = 0.549911 + 0.309916I$ $a = -1.38013 + 0.77780I$ $b = 1.261070 + 0.218641I$	$0.32910 - 1.53058I$	$-7.48489 + 4.43065I$
$u = 0.549911 - 0.309916I$ $a = -1.38013 - 0.77780I$ $b = 1.261070 - 0.218641I$	$0.32910 + 1.53058I$	$-7.48489 - 4.43065I$
$u = -0.549911 + 0.309916I$ $a = 1.38013 + 0.77780I$ $b = -0.383681 - 0.896862I$	$0.32910 + 1.53058I$	$-7.48489 - 4.43065I$
$u = -0.549911 - 0.309916I$ $a = 1.38013 - 0.77780I$ $b = -0.383681 + 0.896862I$	$0.32910 - 1.53058I$	$-7.48489 + 4.43065I$
$u = -0.21917 + 1.41878I$ $a = 0.106340 + 0.688402I$ $b = -1.43286 - 1.54951I$	$5.87256 + 4.40083I$	$-3.25569 - 3.49859I$
$u = -0.21917 - 1.41878I$ $a = 0.106340 - 0.688402I$ $b = -1.43286 + 1.54951I$	$5.87256 - 4.40083I$	$-3.25569 + 3.49859I$
$u = 0.21917 + 1.41878I$ $a = -0.106340 + 0.688402I$ $b = 0.967447 + 0.638115I$	$5.87256 - 4.40083I$	$-3.25569 + 3.49859I$
$u = 0.21917 - 1.41878I$ $a = -0.106340 - 0.688402I$ $b = 0.967447 - 0.638115I$	$5.87256 + 4.40083I$	$-3.25569 - 3.49859I$

IV. $I_4^u =$
$\langle -2u^3a+2u^3+\cdots+2a^2+b,\ -2u^3a^2+8u^3a+\cdots+8a-2,\ u^4+u^3+2u^2+2u+1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3-4u-6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.621744 + 0.440597I$ $a = 0.231503 - 0.048586I$ $b = 0.496332 - 0.463157I$	$3.28987 + 2.02988I$	$-4.00000 - 3.46410I$
$u = -0.621744 + 0.440597I$ $a = -0.64313 + 2.57341I$ $b = -0.45889 - 1.59209I$	$3.28987 + 2.02988I$	$-4.00000 - 3.46410I$
$u = -0.621744 + 0.440597I$ $a = 2.55302 - 1.00733I$ $b = -1.42232 + 1.41895I$	$3.28987 + 2.02988I$	$-4.00000 - 3.46410I$
$u = -0.621744 - 0.440597I$ $a = 0.231503 + 0.048586I$ $b = 0.496332 + 0.463157I$	$3.28987 - 2.02988I$	$-4.00000 + 3.46410I$
$u = -0.621744 - 0.440597I$ $a = -0.64313 - 2.57341I$ $b = -0.45889 + 1.59209I$	$3.28987 - 2.02988I$	$-4.00000 + 3.46410I$
$u = -0.621744 - 0.440597I$ $a = 2.55302 + 1.00733I$ $b = -1.42232 - 1.41895I$	$3.28987 - 2.02988I$	$-4.00000 + 3.46410I$
$u = 0.121744 + 1.306620I$ $a = -0.305126 + 1.095260I$ $b = -0.07449 + 1.73534I$	$3.28987 - 2.02988I$	$-4.00000 + 3.46410I$
$u = 0.121744 + 1.306620I$ $a = -0.365118 + 0.741654I$ $b = 2.37156 - 0.58328I$	$3.28987 - 2.02988I$	$-4.00000 + 3.46410I$
$u = 0.121744 + 1.306620I$ $a = 0.528852 - 0.319426I$ $b = 0.0878104 - 0.0563109I$	$3.28987 - 2.02988I$	$-4.00000 + 3.46410I$
$u = 0.121744 - 1.306620I$ $a = -0.305126 - 1.095260I$ $b = -0.07449 - 1.73534I$	$3.28987 + 2.02988I$	$-4.00000 - 3.46410I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.121744 - 1.306620I$ $a = -0.365118 - 0.741654I$ $b = 2.37156 + 0.58328I$	$3.28987 + 2.02988I$	$-4.00000 - 3.46410I$
$u = 0.121744 - 1.306620I$ $a = 0.528852 + 0.319426I$ $b = 0.0878104 + 0.0563109I$	$3.28987 + 2.02988I$	$-4.00000 - 3.46410I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)^{10}$ $\cdot(u^9+6u^8+15u^7+24u^6+31u^5+30u^4+21u^3+12u^2+4u-1)$ $\cdot(u^{12}+8u^{11}+\cdots+2u^2+1)(u^{56}+19u^{55}+\cdots-20u+1)$
c_2, c_7	$(u^2+1)^5(u^9+3u^7+3u^5+3u^3+2u+1)$ $\cdot(u^{12}+4u^{10}-u^9+6u^8-3u^7+6u^6-3u^5+5u^4-3u^3+2u^2-2u+1)$ $\cdot(u^{56}+u^{55}+\cdots-10u^2+1)$
c_3, c_4, c_8	$(u^2+1)^5(u^9+3u^7+3u^5+3u^3+2u+1)$ $\cdot(u^{12}+4u^{10}-u^9+6u^8-3u^7+6u^6-3u^5+5u^4-3u^3+2u^2-2u+1)$ $\cdot(u^{56}+u^{55}+\cdots+2u+1)$
c_5, c_{10}, c_{11}	$((u^3+2u+1)^3)(u^4-u^3+2u^2-2u+1)^3(u^{10}+5u^8+\cdots-u^2+1)$ $\cdot(u^{56}+2u^{55}+\cdots+5u+2)$
c_6	$(u^2-u+1)^6(u^3+3u^2+5u+2)^3(u^{10}+u^8+8u^6+3u^4+3u^2+1)$ $\cdot(u^{56}-2u^{55}+\cdots-231u+202)$
c_9	$(u^3+2u+1)^3(u^4-u^3+2u^2-2u+1)^3(u^5+u^4+2u^3+u^2+u+1)^2$ $\cdot(u^{56}-8u^{55}+\cdots-1317u+136)$
c_{12}	$(u^3+2u+1)^3(u^4-u^3+2u^2-2u+1)^3(u^5-u^4+2u^3-u^2+u-1)^2$ $\cdot(u^{56}-8u^{55}+\cdots-1317u+136)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)^{10}$ $\cdot(y^9-6y^8-y^7+36y^6+15y^5-42y^4+17y^3+84y^2+40y-1)$ $\cdot(y^{12}-8y^{11}+\cdots+4y+1)(y^{56}+47y^{55}+\cdots+1224y+1)$
c_2, c_7	$(y+1)^{10}$ $\cdot(y^9+6y^8+15y^7+24y^6+31y^5+30y^4+21y^3+12y^2+4y-1)$ $\cdot(y^{12}+8y^{11}+\cdots+2y^2+1)(y^{56}+19y^{55}+\cdots-20y+1)$
c_3, c_4, c_8	$(y+1)^{10}$ $\cdot(y^9+6y^8+15y^7+24y^6+31y^5+30y^4+21y^3+12y^2+4y-1)$ $\cdot(y^{12}+8y^{11}+\cdots+2y^2+1)(y^{56}+63y^{55}+\cdots-84y+1)$
c_5, c_{10}, c_{11}	$(y^3+4y^2+4y-1)^3(y^4+3y^3+2y^2+1)^3$ $\cdot((y^5+5y^4+8y^3+3y^2-y+1)^2)(y^{56}+52y^{55}+\cdots+19y+4)$
c_6	$(y^2+y+1)^6(y^3+y^2+13y-4)^3(y^5+y^4+8y^3+3y^2+3y+1)^2$ $\cdot(y^{56}+20y^{55}+\cdots+498907y+40804)$
c_9, c_{12}	$(y^3+4y^2+4y-1)^3(y^4+3y^3+2y^2+1)^3$ $\cdot((y^5+3y^4+4y^3+y^2-y-1)^2)(y^{56}+48y^{55}+\cdots-423177y+18496)$