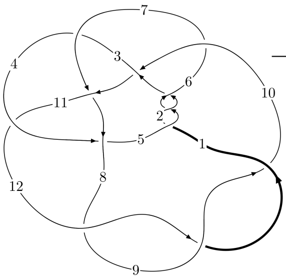
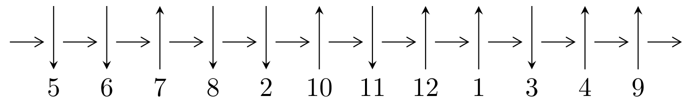
$12a_{1209}$ $(K12a_{1209})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &7.48893 \times 10^{298} u^{111} - 4.47573 \times 10^{299} u^{110} + \cdots + 3.13728 \times 10^{299} b - 4.27963 \times 10^{300}, \\
&4.44331 \times 10^{302} u^{111} - 2.47868 \times 10^{303} u^{110} + \cdots + 1.02338 \times 10^{303} a - 2.27353 \times 10^{304}, \\
&u^{112} - 4u^{111} + \cdots - 55u - 7 \rangle \\
I_2^u = \langle &3u^{13} - u^{12} - 26u^{11} + 2u^{10} + 78u^9 + 11u^8 - 79u^7 - 32u^6 - 23u^5 + 18u^4 + 58u^3 + 12u^2 + b + 13u + 1, \\
&- u^{13} + 8u^{11} + 4u^{10} - 22u^9 - 22u^8 + 17u^7 + 36u^6 + 17u^5 - 9u^4 - 22u^3 - 17u^2 + a - 6u - 1, \\
&u^{14} + u^{13} - 9u^{12} - 11u^{11} + 26u^{10} + 39u^9 - 19u^8 - 47u^7 - 24u^6 - 4u^5 + 26u^4 + 31u^3 + 12u^2 + 6u + 1 \rangle \\
I_3^u = \langle &a^3 - 2a^2 + b - a + 2,\ a^4 - 3a^3 + 4a - 1,\ u - 1 \rangle \\
I_4^u = \langle &b - 1,\ a^2 + au + 2a - u - 2,\ u^2 + u - 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 134 representations.

[1]The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

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

I. $\boldsymbol{I_1^u = \langle 7.49 \times 10^{298} u^{111} - 4.48 \times 10^{299} u^{110} + \cdots + 3.14 \times 10^{299} b - 4.28 \times 10^{300},\ 4.44 \times 10^{302} u^{111} - 2.48 \times 10^{303} u^{110} + \cdots + 1.02 \times 10^{303} a - 2.27 \times 10^{304},\ u^{112} - 4u^{111} + \cdots - 55u - 7\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.434180u^{111} + 2.42206u^{110} + \cdots + 77.6450u + 22.2159 \\ -0.238708u^{111} + 1.42663u^{110} + \cdots + 65.6634u + 13.6412 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.672888u^{111} + 3.84868u^{110} + \cdots + 143.308u + 35.8571 \\ -0.238708u^{111} + 1.42663u^{110} + \cdots + 65.6634u + 13.6412 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.799898u^{111} + 3.60747u^{110} + \cdots + 114.720u + 26.3507 \\ -0.436005u^{111} + 1.72349u^{110} + \cdots + 28.8713u + 6.86379 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0.697419u^{111} - 2.48429u^{110} + \cdots + 3.78721u - 4.87783 \\ 0.995487u^{111} - 3.33126u^{110} + \cdots - 20.6507u - 6.74406 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.549522u^{111} - 2.63485u^{110} + \cdots - 79.2880u - 21.7160 \\ -0.483500u^{111} + 0.733367u^{110} + \cdots - 78.0141u - 13.2688 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -1.92915u^{111} + 8.16559u^{110} + \cdots + 238.894u + 50.0542 \\ -0.674264u^{111} + 3.03349u^{110} + \cdots + 73.4607u + 17.5378 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -0.788999u^{111} + 3.82299u^{110} + \cdots + 101.778u + 28.1283 \\ 0.0637123u^{111} + 0.566343u^{110} + \cdots + 76.1515u + 14.4215 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 3.05210u^{111} - 10.3041u^{110} + \cdots - 50.8805u - 13.6156$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5	$u^{112} + 4u^{111} + \cdots + 55u - 7$
c_3	$u^{112} + 5u^{111} + \cdots - 376u + 16$
c_4	$u^{112} + 2u^{111} + \cdots + 403u - 61$
c_6	$u^{112} - 2u^{111} + \cdots - 403u - 61$
c_7	$u^{112} - 5u^{111} + \cdots + 376u + 16$
c_8, c_9, c_{12}	$u^{112} - 4u^{111} + \cdots - 55u - 7$
c_{10}	$u^{112} - 24u^{110} + \cdots + 1642u - 3505$
c_{11}	$u^{112} - 24u^{110} + \cdots - 1642u - 3505$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_8, c_9, c_{12}	$y^{112} - 116y^{111} + \cdots - 1625y + 49$
c_3, c_7	$y^{112} - 29y^{111} + \cdots - 62016y + 256$
c_4, c_6	$y^{112} + 4y^{111} + \cdots - 334917y + 3721$
c_{10}, c_{11}	$y^{112} - 48y^{111} + \cdots - 513627024y + 12285025$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.321679 + 0.955410I$ $a = -2.48730 - 0.40966I$ $b = 1.44602 - 0.14963I$	$3.88943 - 4.41203I$	0
$u = 0.321679 - 0.955410I$ $a = -2.48730 + 0.40966I$ $b = 1.44602 + 0.14963I$	$3.88943 + 4.41203I$	0
$u = -0.405419 + 0.846552I$ $a = -0.040244 - 0.553258I$ $b = -0.344832 + 0.366948I$	$0.51401 - 4.74927I$	0
$u = -0.405419 - 0.846552I$ $a = -0.040244 + 0.553258I$ $b = -0.344832 - 0.366948I$	$0.51401 + 4.74927I$	0
$u = -0.547671 + 0.952094I$ $a = -1.99606 + 0.66515I$ $b = 1.52327 + 0.24630I$	$6.7615 + 13.1536I$	0
$u = -0.547671 - 0.952094I$ $a = -1.99606 - 0.66515I$ $b = 1.52327 - 0.24630I$	$6.7615 - 13.1536I$	0
$u = -0.556694 + 0.699427I$ $a = 0.695091 + 0.018015I$ $b = -0.556694 - 0.699427I$	$9.67295I$	0
$u = -0.556694 - 0.699427I$ $a = 0.695091 - 0.018015I$ $b = -0.556694 + 0.699427I$	$- 9.67295I$	0
$u = 0.838087 + 0.304732I$ $a = 0.924454 + 0.042715I$ $b = -0.551175 - 0.110613I$	$-1.167220 + 0.162853I$	0
$u = 0.838087 - 0.304732I$ $a = 0.924454 - 0.042715I$ $b = -0.551175 + 0.110613I$	$-1.167220 - 0.162853I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.551002 + 0.686614I$ $a = 0.776150 - 0.007145I$ $b = -0.328491 + 0.467072I$	$-1.88406 - 2.20530I$	0
$u = 0.551002 - 0.686614I$ $a = 0.776150 + 0.007145I$ $b = -0.328491 - 0.467072I$	$-1.88406 + 2.20530I$	0
$u = 0.871319 + 0.097886I$ $a = 1.204680 - 0.009200I$ $b = 0.405993 + 0.099359I$	$-0.792868 + 0.014090I$	0
$u = 0.871319 - 0.097886I$ $a = 1.204680 + 0.009200I$ $b = 0.405993 - 0.099359I$	$-0.792868 - 0.014090I$	0
$u = 0.483629 + 0.729393I$ $a = -0.128824 + 0.158406I$ $b = 0.079070 - 0.525923I$	$-1.64840 - 2.53965I$	0
$u = 0.483629 - 0.729393I$ $a = -0.128824 - 0.158406I$ $b = 0.079070 + 0.525923I$	$-1.64840 + 2.53965I$	0
$u = -0.506988 + 0.711723I$ $a = 1.85722 - 1.07160I$ $b = -1.52140 - 0.22264I$	$8.66599 + 5.50260I$	0
$u = -0.506988 - 0.711723I$ $a = 1.85722 + 1.07160I$ $b = -1.52140 + 0.22264I$	$8.66599 - 5.50260I$	0
$u = 0.306485 + 1.115190I$ $a = 1.99195 + 0.40121I$ $b = -1.317420 + 0.100162I$	$2.53996 - 4.69116I$	0
$u = 0.306485 - 1.115190I$ $a = 1.99195 - 0.40121I$ $b = -1.317420 - 0.100162I$	$2.53996 + 4.69116I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.040390 + 0.527001I$ $a = 0.887183 + 0.696092I$ $b = -1.47232 - 0.13274I$	$5.47290 + 1.48951I$	0
$u = 1.040390 - 0.527001I$ $a = 0.887183 - 0.696092I$ $b = -1.47232 + 0.13274I$	$5.47290 - 1.48951I$	0
$u = -0.533311 + 0.624626I$ $a = 1.55211 - 0.93488I$ $b = -1.51214 + 0.07926I$	$8.52713 - 0.93448I$	0
$u = -0.533311 - 0.624626I$ $a = 1.55211 + 0.93488I$ $b = -1.51214 - 0.07926I$	$8.52713 + 0.93448I$	0
$u = 0.171948 + 0.794989I$ $a = 2.24121 + 0.38931I$ $b = -1.50281 + 0.25807I$	$8.09567 - 6.13786I$	0
$u = 0.171948 - 0.794989I$ $a = 2.24121 - 0.38931I$ $b = -1.50281 - 0.25807I$	$8.09567 + 6.13786I$	0
$u = 0.416047 + 0.685828I$ $a = -2.09609 - 1.79075I$ $b = 1.48957 + 0.00500I$	$7.38069 - 3.65080I$	0
$u = 0.416047 - 0.685828I$ $a = -2.09609 + 1.79075I$ $b = 1.48957 - 0.00500I$	$7.38069 + 3.65080I$	0
$u = 0.760960$ $a = -2.05033$ $b = 1.65282$	6.71801	0
$u = 1.265270 + 0.034808I$ $a = 0.423245 + 0.826019I$ $b = 0.091380 + 0.347715I$	$-2.44897 + 0.28218I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.265270 - 0.034808I$ $a = 0.423245 - 0.826019I$ $b = 0.091380 - 0.347715I$	$-2.44897 - 0.28218I$	0
$u = 1.202520 + 0.425853I$ $a = -1.53659 - 1.21523I$ $b = 1.294470 - 0.019710I$	$1.12792 - 0.89446I$	0
$u = 1.202520 - 0.425853I$ $a = -1.53659 + 1.21523I$ $b = 1.294470 + 0.019710I$	$1.12792 + 0.89446I$	0
$u = -0.714941 + 1.068540I$ $a = -1.66011 + 0.53628I$ $b = 1.45359 - 0.14068I$	$6.42066 - 6.67264I$	0
$u = -0.714941 - 1.068540I$ $a = -1.66011 - 0.53628I$ $b = 1.45359 + 0.14068I$	$6.42066 + 6.67264I$	0
$u = 1.294470 + 0.019710I$ $a = -0.199984 - 1.223820I$ $b = 1.202520 - 0.425853I$	$-1.12792 - 0.89446I$	0
$u = 1.294470 - 0.019710I$ $a = -0.199984 + 1.223820I$ $b = 1.202520 + 0.425853I$	$-1.12792 + 0.89446I$	0
$u = 0.683717$ $a = 0.968888$ $b = -0.237400$	-1.21099	-8.47520
$u = -1.317420 + 0.100162I$ $a = -0.317926 + 0.663451I$ $b = 0.306485 + 1.115190I$	$-2.53996 + 4.69116I$	0
$u = -1.317420 - 0.100162I$ $a = -0.317926 - 0.663451I$ $b = 0.306485 - 1.115190I$	$-2.53996 - 4.69116I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.333370 + 0.034104I$ $a = 0.71226 - 1.76474I$ $b = -1.333370 - 0.034104I$	$-5.25957I$	0
$u = -1.333370 - 0.034104I$ $a = 0.71226 + 1.76474I$ $b = -1.333370 + 0.034104I$	$5.25957I$	0
$u = 1.33647$ $a = -0.563365$ $b = 2.14347$	3.34549	0
$u = -1.34328$ $a = 1.66814$ $b = -1.71082$	4.88748	0
$u = -1.380120 + 0.088053I$ $a = -1.29268 + 0.86109I$ $b = 1.42691 + 0.18223I$	$-2.29797 + 1.74948I$	0
$u = -1.380120 - 0.088053I$ $a = -1.29268 - 0.86109I$ $b = 1.42691 - 0.18223I$	$-2.29797 - 1.74948I$	0
$u = -1.355270 + 0.283343I$ $a = 0.85616 - 1.19537I$ $b = -1.49734 - 0.39913I$	$3.28444 + 9.97047I$	0
$u = -1.355270 - 0.283343I$ $a = 0.85616 + 1.19537I$ $b = -1.49734 + 0.39913I$	$3.28444 - 9.97047I$	0
$u = -1.382200 + 0.144894I$ $a = -0.440287 + 0.676590I$ $b = 1.57137 + 0.57546I$	$1.27966 + 2.23912I$	0
$u = -1.382200 - 0.144894I$ $a = -0.440287 - 0.676590I$ $b = 1.57137 - 0.57546I$	$1.27966 - 2.23912I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.169614 + 0.578662I$ $a = 1.44471 + 1.42829I$ $b = -0.434375 + 0.022634I$	$0.98397 - 3.56679I$	$7.85774 + 7.70365I$
$u = 0.169614 - 0.578662I$ $a = 1.44471 - 1.42829I$ $b = -0.434375 - 0.022634I$	$0.98397 + 3.56679I$	$7.85774 - 7.70365I$
$u = -1.404440 + 0.151869I$ $a = -0.008953 - 1.383810I$ $b = -0.113310 - 0.195536I$	$-4.05419 + 5.99508I$	0
$u = -1.404440 - 0.151869I$ $a = -0.008953 + 1.383810I$ $b = -0.113310 + 0.195536I$	$-4.05419 - 5.99508I$	0
$u = 1.41365 + 0.08564I$ $a = 1.17589 + 1.51053I$ $b = -1.49773 + 0.25118I$	$-1.12496 - 7.09143I$	0
$u = 1.41365 - 0.08564I$ $a = 1.17589 - 1.51053I$ $b = -1.49773 - 0.25118I$	$-1.12496 + 7.09143I$	0
$u = -0.328491 + 0.467072I$ $a = -0.872955 + 0.465938I$ $b = 0.551002 + 0.686614I$	$1.88406 + 2.20530I$	$7.62600 - 6.55616I$
$u = -0.328491 - 0.467072I$ $a = -0.872955 - 0.465938I$ $b = 0.551002 - 0.686614I$	$1.88406 - 2.20530I$	$7.62600 + 6.55616I$
$u = -0.551175 + 0.110613I$ $a = 0.601595 + 0.017597I$ $b = 0.838087 - 0.304732I$	$1.167220 + 0.162853I$	$6.34896 - 5.05762I$
$u = -0.551175 - 0.110613I$ $a = 0.601595 - 0.017597I$ $b = 0.838087 + 0.304732I$	$1.167220 - 0.162853I$	$6.34896 + 5.05762I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.42691 + 0.18223I$ $a = 0.316859 + 0.960364I$ $b = -1.380120 + 0.088053I$	$2.29797 - 1.74948I$	0
$u = 1.42691 - 0.18223I$ $a = 0.316859 - 0.960364I$ $b = -1.380120 - 0.088053I$	$2.29797 + 1.74948I$	0
$u = 0.413365 + 0.362962I$ $a = -1.84869 - 0.43224I$ $b = 1.66446 - 0.15584I$	$6.75617 - 0.15175I$	$1.77908 + 7.36297I$
$u = 0.413365 - 0.362962I$ $a = -1.84869 + 0.43224I$ $b = 1.66446 + 0.15584I$	$6.75617 + 0.15175I$	$1.77908 - 7.36297I$
$u = 1.44602 + 0.14963I$ $a = -0.219608 - 0.789683I$ $b = 0.321679 - 0.955410I$	$-3.88943 - 4.41203I$	0
$u = 1.44602 - 0.14963I$ $a = -0.219608 + 0.789683I$ $b = 0.321679 + 0.955410I$	$-3.88943 + 4.41203I$	0
$u = 1.45359 + 0.14068I$ $a = 0.154262 - 0.361321I$ $b = -0.714941 - 1.068540I$	$-6.42066 - 6.67264I$	0
$u = 1.45359 - 0.14068I$ $a = 0.154262 + 0.361321I$ $b = -0.714941 + 1.068540I$	$-6.42066 + 6.67264I$	0
$u = 0.079070 + 0.525923I$ $a = -0.466179 + 0.393862I$ $b = 0.483629 - 0.729393I$	$1.64840 - 2.53965I$	$7.80985 + 5.36906I$
$u = 0.079070 - 0.525923I$ $a = -0.466179 - 0.393862I$ $b = 0.483629 + 0.729393I$	$1.64840 + 2.53965I$	$7.80985 - 5.36906I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.47232 + 0.13274I$ $a = -0.593293 - 0.242129I$ $b = 1.040390 - 0.527001I$	$-5.47290 + 1.48951I$	0
$u = -1.47232 - 0.13274I$ $a = -0.593293 + 0.242129I$ $b = 1.040390 + 0.527001I$	$-5.47290 - 1.48951I$	0
$u = 1.48957 + 0.00500I$ $a = -0.650175 + 0.780207I$ $b = 0.416047 + 0.685828I$	$-7.38069 + 3.65080I$	0
$u = 1.48957 - 0.00500I$ $a = -0.650175 - 0.780207I$ $b = 0.416047 - 0.685828I$	$-7.38069 - 3.65080I$	0
$u = -0.344832 + 0.366948I$ $a = 0.789260 + 0.113577I$ $b = -0.405419 + 0.846552I$	$-0.51401 + 4.74927I$	$-1.10748 - 10.25917I$
$u = -0.344832 - 0.366948I$ $a = 0.789260 - 0.113577I$ $b = -0.405419 - 0.846552I$	$-0.51401 - 4.74927I$	$-1.10748 + 10.25917I$
$u = -1.51214 + 0.07926I$ $a = 0.321771 + 0.335141I$ $b = -0.533311 + 0.624626I$	$-8.52713 + 0.93448I$	0
$u = -1.51214 - 0.07926I$ $a = 0.321771 - 0.335141I$ $b = -0.533311 - 0.624626I$	$-8.52713 - 0.93448I$	0
$u = -1.49773 + 0.25118I$ $a = -0.66168 + 1.53344I$ $b = 1.41365 + 0.08564I$	$1.12496 + 7.09143I$	0
$u = -1.49773 - 0.25118I$ $a = -0.66168 - 1.53344I$ $b = 1.41365 - 0.08564I$	$1.12496 - 7.09143I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.50281 + 0.25807I$ $a = -0.328105 + 0.408347I$ $b = 0.171948 + 0.794989I$	$-8.09567 + 6.13786I$	0
$u = -1.50281 - 0.25807I$ $a = -0.328105 - 0.408347I$ $b = 0.171948 - 0.794989I$	$-8.09567 - 6.13786I$	0
$u = -1.48639 + 0.34563I$ $a = -1.34811 + 1.09317I$ $b = 1.53017 + 0.25062I$	$-1.98950 + 9.04012I$	0
$u = -1.48639 - 0.34563I$ $a = -1.34811 - 1.09317I$ $b = 1.53017 - 0.25062I$	$-1.98950 - 9.04012I$	0
$u = -1.52140 + 0.22264I$ $a = 0.567500 - 0.505341I$ $b = -0.506988 - 0.711723I$	$-8.66599 + 5.50260I$	0
$u = -1.52140 - 0.22264I$ $a = 0.567500 + 0.505341I$ $b = -0.506988 + 0.711723I$	$-8.66599 - 5.50260I$	0
$u = 1.52327 + 0.24630I$ $a = 0.487720 + 0.544350I$ $b = -0.547671 + 0.952094I$	$-6.7615 - 13.1536I$	0
$u = 1.52327 - 0.24630I$ $a = 0.487720 - 0.544350I$ $b = -0.547671 - 0.952094I$	$-6.7615 + 13.1536I$	0
$u = -1.49734 + 0.39913I$ $a = 1.15254 - 1.01466I$ $b = -1.355270 - 0.283343I$	$-3.28444 + 9.97047I$	0
$u = -1.49734 - 0.39913I$ $a = 1.15254 + 1.01466I$ $b = -1.355270 + 0.283343I$	$-3.28444 - 9.97047I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.53017 + 0.25062I$ $a = 0.669484 + 1.154560I$ $b = -1.48639 + 0.34563I$	$1.98950 - 9.04012I$	0
$u = 1.53017 - 0.25062I$ $a = 0.669484 - 1.154560I$ $b = -1.48639 - 0.34563I$	$1.98950 + 9.04012I$	0
$u = -0.434375 + 0.022634I$ $a = -1.63358 + 1.82737I$ $b = 0.169614 + 0.578662I$	$-0.98397 + 3.56679I$	$-7.85774 - 7.70365I$
$u = -0.434375 - 0.022634I$ $a = -1.63358 - 1.82737I$ $b = 0.169614 - 0.578662I$	$-0.98397 - 3.56679I$	$-7.85774 + 7.70365I$
$u = 0.405993 + 0.099359I$ $a = -3.37524 + 0.24419I$ $b = 0.871319 + 0.097886I$	$0.792868 - 0.014090I$	$14.9886 + 7.9999I$
$u = 0.405993 - 0.099359I$ $a = -3.37524 - 0.24419I$ $b = 0.871319 - 0.097886I$	$0.792868 + 0.014090I$	$14.9886 - 7.9999I$
$u = 1.55311 + 0.34453I$ $a = -1.05597 - 1.08729I$ $b = 1.55311 - 0.34453I$	$-17.8765I$	0
$u = 1.55311 - 0.34453I$ $a = -1.05597 + 1.08729I$ $b = 1.55311 + 0.34453I$	$17.8765I$	0
$u = -1.59684$ $a = 0.697025$ $b = -0.277564$	-8.75489	0
$u = 0.091380 + 0.347715I$ $a = -4.47473 + 0.57917I$ $b = 1.265270 + 0.034808I$	$2.44897 - 0.28218I$	$0.405352 + 1.322822I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.091380 - 0.347715I$ $a = -4.47473 - 0.57917I$ $b = 1.265270 - 0.034808I$	$2.44897 + 0.28218I$	$0.405352 - 1.322822I$
$u = 1.65282$ $a = 0.183014$ $b = 0.760960$	-6.71801	0
$u = 1.66446 + 0.15584I$ $a = -0.099057 - 0.176948I$ $b = 0.413365 - 0.362962I$	$-6.75617 - 0.15175I$	0
$u = 1.66446 - 0.15584I$ $a = -0.099057 + 0.176948I$ $b = 0.413365 + 0.362962I$	$-6.75617 + 0.15175I$	0
$u = 1.57137 + 0.57546I$ $a = 1.301010 + 0.520573I$ $b = -1.382200 + 0.144894I$	$-1.27966 - 2.23912I$	0
$u = 1.57137 - 0.57546I$ $a = 1.301010 - 0.520573I$ $b = -1.382200 - 0.144894I$	$-1.27966 + 2.23912I$	0
$u = -1.71082$ $a = 0.0335132$ $b = -1.34328$	-4.88748	0
$u = -0.277564$ $a = -2.41318$ $b = -1.59684$	8.75489	11.2650
$u = -0.237400$ $a = 2.10670$ $b = 0.683717$	1.21099	8.47520
$u = -0.113310 + 0.195536I$ $a = 9.33406 - 3.30415I$ $b = -1.404440 - 0.151869I$	$4.05419 + 5.99508I$	$-2.99141 - 8.55802I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.113310-0.195536I$ $a=\ \ 9.33406+3.30415I$ $b=-1.404440+0.151869I$	$4.05419-5.99508I$	$-2.99141+8.55802I$
$u=\ \ 2.14347$ $a=-0.985209$ $b=\ \ 1.33647$	-3.34549	0

II.

$\boldsymbol{I_2^u = \langle 3u^{13} - u^{12} + \cdots + b + 1,\ -u^{13} + 8u^{11} + \cdots + a - 1,\ u^{14} + u^{13} + \cdots + 6u + 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^{13} - 8u^{11} + \cdots + 6u + 1 \\ -3u^{13} + u^{12} + \cdots - 13u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -2u^{13} + u^{12} + \cdots + 5u^2 - 7u \\ -3u^{13} + u^{12} + \cdots - 13u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^{13} + 9u^{11} + \cdots - 3u - 2 \\ 3u^{13} - u^{12} + \cdots + 13u + 1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 3u^{13} - u^{12} + \cdots + 13u + 4 \\ -10u^{13} + 5u^{12} + \cdots - 35u - 4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^{13} + 9u^{11} + \cdots - 3u - 3 \\ 11u^{13} - 5u^{12} + \cdots + 39u + 4 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 2u^{13} - u^{12} + \cdots + 10u + 1 \\ -8u^{13} + 2u^{12} + \cdots - 31u - 8 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 3u^{13} - u^{12} + \cdots + 14u + 3 \\ -7u^{13} + 3u^{12} + \cdots - 28u - 4 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 12u^{13} + 5u^{12} - 108u^{11} - 69u^{10} + 327u^9 + 273u^8 - 311u^7 - 362u^6 - 159u^5 + 17u^4 + 288u^3 + 207u^2 + 81u + 36$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_{12}	$u^{14} + u^{13} + \cdots + 6u + 1$
c_3	$u^{14} - 4u^{13} + \cdots + 91u - 29$
c_4	$u^{14} + u^{13} + \cdots + u - 1$
c_5, c_8, c_9	$u^{14} - u^{13} + \cdots - 6u + 1$
c_6	$u^{14} - u^{13} + \cdots - u - 1$
c_7	$u^{14} + 4u^{13} + \cdots - 91u - 29$
c_{10}	$u^{14} - u^{13} + \cdots - u + 1$
c_{11}	$u^{14} + u^{13} + \cdots + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_8, c_9, c_{12}	$y^{14} - 19y^{13} + \cdots - 12y + 1$
c_3, c_7	$y^{14} - 6y^{13} + \cdots - 1611y + 841$
c_4, c_6	$y^{14} + 9y^{13} + \cdots + y + 1$
c_{10}, c_{11}	$y^{14} - 7y^{13} + \cdots - 7y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.068732 + 0.763152I$ $a = 3.26573 - 0.25691I$ $b = -1.41455 + 0.12580I$	$4.88055 - 5.52492I$	$4.39718 + 5.23580I$
$u = -0.068732 - 0.763152I$ $a = 3.26573 + 0.25691I$ $b = -1.41455 - 0.12580I$	$4.88055 + 5.52492I$	$4.39718 - 5.23580I$
$u = 1.311340 + 0.253442I$ $a = -0.863185 - 0.946981I$ $b = 1.311340 - 0.253442I$	$-1.71554I$	$-60.10 - 0.147212I$
$u = 1.311340 - 0.253442I$ $a = -0.863185 + 0.946981I$ $b = 1.311340 + 0.253442I$	$1.71554I$	$-60.10 + 0.147212I$
$u = -1.35049$ $a = -0.818895$ $b = 2.02006$	3.04921	-9.67630
$u = -1.41455 + 0.12580I$ $a = -0.107751 + 0.995504I$ $b = -0.068732 + 0.763152I$	$-4.88055 + 5.52492I$	$-4.39718 - 5.23580I$
$u = -1.41455 - 0.12580I$ $a = -0.107751 - 0.995504I$ $b = -0.068732 - 0.763152I$	$-4.88055 - 5.52492I$	$-4.39718 + 5.23580I$
$u = -1.44062 + 0.23762I$ $a = 1.00474 - 1.60565I$ $b = -1.44062 - 0.23762I$	$8.84538I$	$0. - 8.04036I$
$u = -1.44062 - 0.23762I$ $a = 1.00474 + 1.60565I$ $b = -1.44062 + 0.23762I$	$-8.84538I$	$0. + 8.04036I$
$u = -0.020694 + 0.453060I$ $a = -1.56710 + 0.29858I$ $b = -0.020694 - 0.453060I$	$-3.66683I$	$0. + 5.82256I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.020694-0.453060I$ $a=-1.56710-0.29858I$ $b=-0.020694+0.453060I$	$3.66683I$	$0.-5.82256I$
$u=-0.218049$ $a=\ \ 0.297239$ $b=\ \ 1.81498$	7.07035	25.2800
$u=\ \ 1.81498$ $a=\ \ 0.253759$ $b=-0.218049$	-7.07035	-25.2800
$u=\ \ 2.02006$ $a=\ \ 0.803026$ $b=-1.35049$	-3.04921	9.67630

III. $I_3^u = \langle a^3 - 2a^2 + b - a + 2,\ a^4 - 3a^3 + 4a - 1,\ u - 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -17a^3 + 28a^2 + 36a - 7$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$(y-1)^4$
c_3, c_4	$y^4 - 8y^3 + 18y^2 - 13y + 1$
c_6, c_8, c_9 c_{12}	$(y^2 - 3y + 1)^2$
c_7	y^4
c_{10}, c_{11}	$y^4 - 7y^3 + 13y^2 - 7y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.09529$ $b = 0.618034$	-0.657974	9.49800
$u = 1.00000$ $a = 1.47726$ $b = 0.618034$	-0.657974	52.4810
$u = 1.00000$ $a = 0.262360$ $b = -1.61803$	7.23771	4.06530
$u = 1.00000$ $a = 2.35567$ $b = -1.61803$	7.23771	10.9560

IV. $I_4^u = \langle b-1,\ a^2+au+2a-u-2,\ u^2+u-1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 7au+6a-4u-15$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5	$(y^2 - 3y + 1)^2$
c_3	y^4
c_6, c_7	$y^4 - 8y^3 + 18y^2 - 13y + 1$
c_8, c_9, c_{12}	$(y - 1)^4$
c_{10}, c_{11}	$y^4 - 7y^3 + 13y^2 - 7y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_4	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = 0.772223$ $b = 1.00000$	0.657974	−9.49800
$u = 0.618034$ $a = -3.39026$ $b = 1.00000$	0.657974	−52.4810
$u = -1.61803$ $a = -0.837853$ $b = 1.00000$	−7.23771	−4.06530
$u = -1.61803$ $a = 0.455887$ $b = 1.00000$	−7.23771	−10.9560

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^4)(u^2+u-1)^2(u^{14}+u^{13}+\cdots+6u+1)$ $\cdot(u^{112}+4u^{111}+\cdots+55u-7)$
c_3	$u^4(u^4-2u^3+\cdots+3u+1)(u^{14}-4u^{13}+\cdots+91u-29)$ $\cdot(u^{112}+5u^{111}+\cdots-376u+16)$
c_4	$((u^2+u-1)^2)(u^4-2u^3+\cdots+3u+1)(u^{14}+u^{13}+\cdots+u-1)$ $\cdot(u^{112}+2u^{111}+\cdots+403u-61)$
c_5	$((u+1)^4)(u^2-u-1)^2(u^{14}-u^{13}+\cdots-6u+1)$ $\cdot(u^{112}+4u^{111}+\cdots+55u-7)$
c_6	$((u^2-u-1)^2)(u^4+2u^3+\cdots-3u+1)(u^{14}-u^{13}+\cdots-u-1)$ $\cdot(u^{112}-2u^{111}+\cdots-403u-61)$
c_7	$u^4(u^4+2u^3+\cdots-3u+1)(u^{14}+4u^{13}+\cdots-91u-29)$ $\cdot(u^{112}-5u^{111}+\cdots+376u+16)$
c_8, c_9	$((u+1)^4)(u^2-u-1)^2(u^{14}-u^{13}+\cdots-6u+1)$ $\cdot(u^{112}-4u^{111}+\cdots-55u-7)$
c_{10}	$(u^4-u^3-3u^2+u+1)(u^4+u^3-3u^2-u+1)(u^{14}-u^{13}+\cdots-u+1)$ $\cdot(u^{112}-24u^{110}+\cdots+1642u-3505)$
c_{11}	$(u^4-u^3-3u^2+u+1)(u^4+u^3-3u^2-u+1)(u^{14}+u^{13}+\cdots+u+1)$ $\cdot(u^{112}-24u^{110}+\cdots-1642u-3505)$
c_{12}	$((u-1)^4)(u^2+u-1)^2(u^{14}+u^{13}+\cdots+6u+1)$ $\cdot(u^{112}-4u^{111}+\cdots-55u-7)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_8, c_9, c_{12}	$((y-1)^4)(y^2-3y+1)^2(y^{14}-19y^{13}+\cdots-12y+1)$ $\cdot\,(y^{112}-116y^{111}+\cdots-1625y+49)$
c_3, c_7	$y^4(y^4-8y^3+\cdots-13y+1)(y^{14}-6y^{13}+\cdots-1611y+841)$ $\cdot\,(y^{112}-29y^{111}+\cdots-62016y+256)$
c_4, c_6	$((y^2-3y+1)^2)(y^4-8y^3+\cdots-13y+1)(y^{14}+9y^{13}+\cdots+y+1)$ $\cdot\,(y^{112}+4y^{111}+\cdots-334917y+3721)$
c_{10}, c_{11}	$((y^4-7y^3+13y^2-7y+1)^2)(y^{14}-7y^{13}+\cdots-7y+1)$ $\cdot\,(y^{112}-48y^{111}+\cdots-513627024y+12285025)$