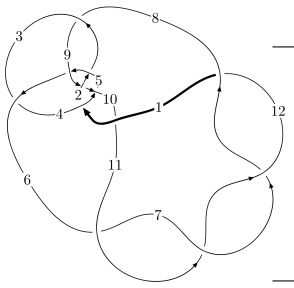
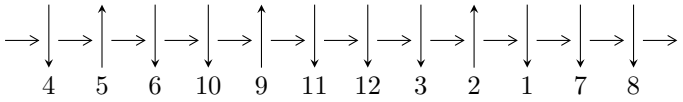
$12a_{0809}$ $(K12a_{0809})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 148539u^{48} - 527493u^{47} + \cdots + 8051b - 394683,\ 95347u^{48} - 282451u^{47} + \cdots + 32204a + 36495,$$
$$u^{49} - 5u^{48} + \cdots + 17u + 4\rangle$$
$$I_2^u = \langle 2517u^{34}a + 42256u^{34} + \cdots + 6152a + 31050,\ 6u^{34}a - 3u^{34} + \cdots + 6a - 17,\ u^{35} + 2u^{34} + \cdots + 4u - 1\rangle$$
$$I_3^u = \langle u^{12} + u^{11} - 6u^{10} - 6u^9 + 12u^8 + 13u^7 - 9u^6 - 12u^5 + 2u^4 + 4u^3 + u^2 + b + u + 1,$$
$$-u^{14} + u^{13} + 8u^{12} - 7u^{11} - 23u^{10} + 17u^9 + 28u^8 - 16u^7 - 13u^6 + 5u^5 + u^4 - 3u^3 + 3u^2 + a + 2u + 1,$$
$$u^{15} - 2u^{14} - 7u^{13} + 15u^{12} + 17u^{11} - 40u^{10} - 18u^9 + 45u^8 + 14u^7 - 22u^6 - 13u^5 + 8u^4 + u^3 + u^2 + 1\rangle$$
$$I_4^u = \langle au + b + u + 1,\ a^2 + 3au + 2a + u + 4,\ u^2 + u - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 138 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. $I_1^u = \langle 148539u^{48} - 527493u^{47} + \cdots + 8051b - 394683,\ 95347u^{48} - 282451u^{47} + \cdots + 32204a + 36495,\ u^{49} - 5u^{48} + \cdots + 17u + 4 \rangle$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -2.96072u^{48} + 8.77068u^{47} + \cdots - 24.7516u - 1.13324 \\ -18.4498u^{48} + 65.5189u^{47} + \cdots + 241.353u + 49.0229 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -7.08294u^{48} + 17.6739u^{47} + \cdots + 1.25894u + 5.64181 \\ -27.2013u^{48} + 89.0489u^{47} + \cdots + 287.738u + 59.6427 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -4.22094u^{48} + 9.52301u^{47} + \cdots - 21.4049u + 0.492516 \\ -11.5817u^{48} + 33.6645u^{47} + \cdots + 72.2484u + 16.8837 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -8.39172u^{48} + 25.3461u^{47} + \cdots + 57.0803u + 14.9414 \\ -12.9692u^{48} + 37.3577u^{47} + \cdots + 90.6477u + 20.3169 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 4.12132u^{48} - 18.5185u^{47} + \cdots - 157.649u - 27.2511 \\ 2.08806u^{48} - 10.1386u^{47} + \cdots - 96.3135u - 16.4853 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^5 + 2u^3 + u \\ -u^7 + 3u^5 - 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{1218}{83}u^{48} - \frac{2750}{83}u^{47} + \cdots + \frac{7009}{83}u - \frac{594}{83}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3	$u^{49} + 8u^{48} + \cdots + 17u - 1$
c_2	$u^{49} + 26u^{48} + \cdots + 11u + 2$
c_4, c_8	$u^{49} + 5u^{47} + \cdots + 3u + 1$
c_5, c_9	$u^{49} - u^{48} + \cdots + 27u^2 + 1$
c_6, c_7, c_{11} c_{12}	$u^{49} - 5u^{48} + \cdots + 17u + 4$
c_{10}	$u^{49} - 9u^{48} + \cdots - 1017u + 2272$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3	$y^{49} - 22y^{48} + \cdots + 199y - 1$
c_2	$y^{49} + 20y^{47} + \cdots + 89y - 4$
c_4, c_8	$y^{49} + 10y^{48} + \cdots - 9y - 1$
c_5, c_9	$y^{49} + 25y^{48} + \cdots - 54y - 1$
c_6, c_7, c_{11} c_{12}	$y^{49} - 55y^{48} + \cdots + 137y - 16$
c_{10}	$y^{49} + 9y^{48} + \cdots - 108326159y - 5161984$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.860395+0.482404I$ $a=\ \ 0.024941+0.522248I$ $b=-0.236258+0.004668I$	$-1.333090-0.442268I$	$-22.7302-2.7893I$
$u=-0.860395-0.482404I$ $a=\ \ 0.024941-0.522248I$ $b=-0.236258-0.004668I$	$-1.333090+0.442268I$	$-22.7302+2.7893I$
$u=\ \ 1.038190+0.218664I$ $a=\ \ 0.962395+0.159463I$ $b=\ \ 0.063672-0.241113I$	$-3.12377-8.13177I$	$0.+9.34743I$
$u=\ \ 1.038190-0.218664I$ $a=\ \ 0.962395-0.159463I$ $b=\ \ 0.063672+0.241113I$	$-3.12377+8.13177I$	$0.-9.34743I$
$u=-0.656302+0.593975I$ $a=\ \ 1.73077+1.26119I$ $b=\ \ 0.157164+0.032896I$	$1.0974+15.3120I$	$-6.69862-10.70010I$
$u=-0.656302-0.593975I$ $a=\ \ 1.73077-1.26119I$ $b=\ \ 0.157164-0.032896I$	$1.0974-15.3120I$	$-6.69862+10.70010I$
$u=-0.527749+0.624204I$ $a=-0.344437-0.796756I$ $b=-0.374375+0.028886I$	$-0.22239+2.13464I$	$-12.97767-4.41434I$
$u=-0.527749-0.624204I$ $a=-0.344437+0.796756I$ $b=-0.374375-0.028886I$	$-0.22239-2.13464I$	$-12.97767+4.41434I$
$u=-0.598351+0.535692I$ $a=-1.55845-1.25421I$ $b=\ \ 0.013056+0.352563I$	$-0.78788+6.56431I$	$-12.9454-9.8564I$
$u=-0.598351-0.535692I$ $a=-1.55845+1.25421I$ $b=\ \ 0.013056-0.352563I$	$-0.78788-6.56431I$	$-12.9454+9.8564I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.747144$ $a=\ \ 0.385007$ $b=-0.305862$	-1.10744	-7.81270
$u=-0.162177+0.729155I$ $a=\ \ 0.300367-0.459004I$ $b=\ \ 0.409646-0.408558I$	$0.80721+4.71794I$	$-9.1417-13.3340I$
$u=-0.162177-0.729155I$ $a=\ \ 0.300367+0.459004I$ $b=\ \ 0.409646+0.408558I$	$0.80721-4.71794I$	$-9.1417+13.3340I$
$u=\ \ 0.744466+0.003975I$ $a=-1.81736+0.85970I$ $b=-0.328629+0.159289I$	$-4.13096+1.69814I$	$-18.2040-4.3712I$
$u=\ \ 0.744466-0.003975I$ $a=-1.81736-0.85970I$ $b=-0.328629-0.159289I$	$-4.13096-1.69814I$	$-18.2040+4.3712I$
$u=-0.300631+0.671867I$ $a=\ \ 0.481511+0.645526I$ $b=\ \ 0.987848+0.795214I$	$2.15150-11.04750I$	$-4.44153+5.63378I$
$u=-0.300631-0.671867I$ $a=\ \ 0.481511-0.645526I$ $b=\ \ 0.987848-0.795214I$	$2.15150+11.04750I$	$-4.44153-5.63378I$
$u=\ \ 0.485135+0.542391I$ $a=\ \ 0.943805-0.987006I$ $b=\ \ 0.402923-0.436742I$	$2.90214-1.87444I$	$-0.73211+3.66192I$
$u=\ \ 0.485135-0.542391I$ $a=\ \ 0.943805+0.987006I$ $b=\ \ 0.402923+0.436742I$	$2.90214+1.87444I$	$-0.73211-3.66192I$
$u=\ \ 1.289650+0.140107I$ $a=\ \ 0.300793-0.515547I$ $b=-0.125058+0.334394I$	$-2.81136+8.04498I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.289650 - 0.140107I$ $a = 0.300793 + 0.515547I$ $b = -0.125058 - 0.334394I$	$-2.81136 - 8.04498I$	0
$u = 0.506307 + 0.409416I$ $a = -2.22196 + 1.72599I$ $b = -0.776269 + 0.644378I$	$-1.37259 - 1.45940I$	$-10.10356 + 4.62979I$
$u = 0.506307 - 0.409416I$ $a = -2.22196 - 1.72599I$ $b = -0.776269 - 0.644378I$	$-1.37259 + 1.45940I$	$-10.10356 - 4.62979I$
$u = -0.340049 + 0.552838I$ $a = 0.176095 - 0.121875I$ $b = -0.914800 - 0.629603I$	$-0.03939 - 2.80450I$	$-9.90854 + 3.00975I$
$u = -0.340049 - 0.552838I$ $a = 0.176095 + 0.121875I$ $b = -0.914800 + 0.629603I$	$-0.03939 + 2.80450I$	$-9.90854 - 3.00975I$
$u = -0.537786 + 0.350030I$ $a = -0.059222 - 1.272190I$ $b = 0.103070 + 0.635374I$	$-1.62694 + 1.54828I$	$-11.08710 - 6.22827I$
$u = -0.537786 - 0.350030I$ $a = -0.059222 + 1.272190I$ $b = 0.103070 - 0.635374I$	$-1.62694 - 1.54828I$	$-11.08710 + 6.22827I$
$u = 1.47621 + 0.08489I$ $a = -0.950241 + 0.354999I$ $b = -1.43618 - 0.18131I$	$-5.81539 + 0.81969I$	0
$u = 1.47621 - 0.08489I$ $a = -0.950241 - 0.354999I$ $b = -1.43618 + 0.18131I$	$-5.81539 - 0.81969I$	0
$u = -1.52067 + 0.14417I$ $a = -0.937215 - 0.026137I$ $b = -1.98715 - 0.67865I$	$-3.73933 + 4.27877I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.52067-0.14417I$ $a=-0.937215+0.026137I$ $b=-1.98715+0.67865I$	$-3.73933-4.27877I$	0
$u=-1.55060+0.10978I$ $a=1.84193-0.18622I$ $b=4.05332+0.45056I$	$-8.35293+3.28009I$	0
$u=-1.55060-0.10978I$ $a=1.84193+0.18622I$ $b=4.05332-0.45056I$	$-8.35293-3.28009I$	0
$u=1.54635+0.18703I$ $a=0.757838-0.546719I$ $b=1.80903-1.20397I$	$-7.12280-5.06000I$	0
$u=1.54635-0.18703I$ $a=0.757838+0.546719I$ $b=1.80903+1.20397I$	$-7.12280+5.06000I$	0
$u=1.55747+0.09309I$ $a=0.98887-1.45323I$ $b=2.04164-2.22854I$	$-8.74919-3.11091I$	0
$u=1.55747-0.09309I$ $a=0.98887+1.45323I$ $b=2.04164+2.22854I$	$-8.74919+3.11091I$	0
$u=1.56503+0.15811I$ $a=2.12720-0.54206I$ $b=4.43010-0.79741I$	$-8.03789-9.09579I$	0
$u=1.56503-0.15811I$ $a=2.12720+0.54206I$ $b=4.43010+0.79741I$	$-8.03789+9.09579I$	0
$u=-1.59257+0.00650I$ $a=1.97070+0.65045I$ $b=4.19761+1.43756I$	$-12.06900-1.62283I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.59257-0.00650I$ $a=\ \ 1.97070-0.65045I$ $b=\ \ 4.19761-1.43756I$	$-12.06900+1.62283I$	0
$u=\ \ 1.58602+0.18202I$ $a=-2.19854+0.10847I$ $b=-4.50456+0.32567I$	$-6.4148-18.1914I$	0
$u=\ \ 1.58602-0.18202I$ $a=-2.19854-0.10847I$ $b=-4.50456-0.32567I$	$-6.4148+18.1914I$	0
$u=-0.240166+0.320881I$ $a=\ \ 0.947458+0.195457I$ $b=-0.450401+0.404469I$	$-0.963675+0.866301I$	$-7.31478-5.07695I$
$u=-0.240166-0.320881I$ $a=\ \ 0.947458-0.195457I$ $b=-0.450401-0.404469I$	$-0.963675-0.866301I$	$-7.31478+5.07695I$
$u=\ \ 1.61021+0.11898I$ $a=-1.070280+0.513665I$ $b=-1.94637+0.86375I$	$-9.61044-1.58418I$	0
$u=\ \ 1.61021-0.11898I$ $a=-1.070280-0.513665I$ $b=-1.94637-0.86375I$	$-9.61044+1.58418I$	0
$u=-1.64403+0.02832I$ $a=-1.71447+0.78931I$ $b=-3.43609+1.41784I$	$-12.1970+8.7921I$	0
$u=-1.64403-0.02832I$ $a=-1.71447-0.78931I$ $b=-3.43609-1.41784I$	$-12.1970-8.7921I$	0

II. $I_2^u = \langle 2517u^{34}a + 42256u^{34} + \cdots + 6152a + 31050,\ 6u^{34}a - 3u^{34} + \cdots + 6a - 17,\ u^{35} + 2u^{34} + \cdots + 4u - 1\rangle$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} a \\ -0.143068au^{34} - 2.40186u^{34} + \cdots - 0.349685a - 1.76491 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1.40186au^{34} - 0.835844u^{34} + \cdots + 1.76491a - 8.26067 \\ 1.14671au^{34} + 2.94168u^{34} + \cdots - 0.548059a - 2.67055 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.291480au^{34} + 3.12783u^{34} + \cdots + 1.31831a - 0.266015 \\ -0.215483au^{34} + 1.75865u^{34} + \cdots - 0.291480a - 5.12783 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.255158au^{34} + 3.22247u^{34} + \cdots + 1.31297a + 1.40988 \\ 0.112090au^{34} + 1.82061u^{34} + \cdots - 0.0367191a - 4.35503 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -1.03268au^{34} - 3.36554u^{34} + \cdots + 3.09691a - 2.75956 \\ -3.43455au^{34} - 2.52970u^{34} + \cdots + 1.33201a + 3.50111 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^5 + 2u^3 + u \\ -u^7 + 3u^5 - 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= u^{34} + 2u^{33} - 17u^{32} - 29u^{31} + 126u^{30} + 160u^{29} - 539u^{28} - 330u^{27} + 1491u^{26} - 522u^{25} - 2809u^{24} + 4690u^{23} + 3456u^{22} - 12414u^{21} - 1644u^{20} + 18572u^{19} - 3263u^{18} - 17872u^{17} + 7947u^{16} + 11650u^{15} - 8304u^{14} - 4754u^{13} + 5714u^{12} + 816u^{11} - 3062u^{10} + 144u^9 + 1032u^8 - 416u^7 - 370u^6 + 110u^5 + 8u^4 - 50u^3 - 9u^2 + 2u - 11$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3	$u^{70} - 5u^{69} + \cdots + 118u - 11$
c_2	$(u^{35} - 17u^{34} + \cdots - 2u + 4)^2$
c_4, c_8	$u^{70} - 2u^{69} + \cdots - 3755u - 389$
c_5, c_9	$u^{70} - 4u^{69} + \cdots - u + 1$
c_6, c_7, c_{11} c_{12}	$(u^{35} + 2u^{34} + \cdots + 4u - 1)^2$
c_{10}	$(u^{35} - 8u^{34} + \cdots - 34u - 17)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3	$y^{70} + 23y^{69} + \cdots - 3012y + 121$
c_2	$(y^{35} - 5y^{34} + \cdots + 268y - 16)^2$
c_4, c_8	$y^{70} + 4y^{69} + \cdots - 6317691y + 151321$
c_5, c_9	$y^{70} - 16y^{69} + \cdots + 9y + 1$
c_6, c_7, c_{11} c_{12}	$(y^{35} - 40y^{34} + \cdots + 12y - 1)^2$
c_{10}	$(y^{35} + 8y^{34} + \cdots + 884y - 289)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.666512 + 0.582064I$ $a = -1.239150 + 0.250233I$ $b = -0.059661 - 0.188761I$	$2.64852 - 7.06572I$	$-2.24468 + 9.47416I$
$u = \quad 0.666512 + 0.582064I$ $a = \quad 1.50375 - 1.16447I$ $b = \quad 0.070870 - 0.248710I$	$2.64852 - 7.06572I$	$-2.24468 + 9.47416I$
$u = \quad 0.666512 - 0.582064I$ $a = -1.239150 - 0.250233I$ $b = -0.059661 + 0.188761I$	$2.64852 + 7.06572I$	$-2.24468 - 9.47416I$
$u = \quad 0.666512 - 0.582064I$ $a = \quad 1.50375 + 1.16447I$ $b = \quad 0.070870 + 0.248710I$	$2.64852 + 7.06572I$	$-2.24468 - 9.47416I$
$u = -1.16124$ $a = \quad 0.043408 + 0.442130I$ $b = -0.393345 - 0.073439I$	-0.859981	-0.877410
$u = -1.16124$ $a = \quad 0.043408 - 0.442130I$ $b = -0.393345 + 0.073439I$	-0.859981	-0.877410
$u = -0.782419 + 0.220868I$ $a = -0.54049 - 1.41055I$ $b = -0.306204 + 0.132537I$	$-2.98205 - 1.23863I$	$-15.1065 + 4.7419I$
$u = -0.782419 + 0.220868I$ $a = \quad 1.64861 + 0.56272I$ $b = -0.050193 + 0.786535I$	$-2.98205 - 1.23863I$	$-15.1065 + 4.7419I$
$u = -0.782419 - 0.220868I$ $a = -0.54049 + 1.41055I$ $b = -0.306204 - 0.132537I$	$-2.98205 + 1.23863I$	$-15.1065 - 4.7419I$
$u = -0.782419 - 0.220868I$ $a = \quad 1.64861 - 0.56272I$ $b = -0.050193 - 0.786535I$	$-2.98205 + 1.23863I$	$-15.1065 - 4.7419I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.20404$ $a=\ \ 0.010704+0.441967I$ $b=-0.418731-0.084162I$	-0.860321	-1.06770
$u=-1.20404$ $a=\ \ 0.010704-0.441967I$ $b=-0.418731+0.084162I$	-0.860321	-1.06770
$u=\ \ 0.638463+0.472891I$ $a=\ \ 0.00841-1.58949I$ $b=-0.732835+0.165675I$	$-1.26211-6.69833I$	$-12.2764+10.3456I$
$u=\ \ 0.638463+0.472891I$ $a=-2.23392+0.77030I$ $b=-0.191691-0.277776I$	$-1.26211-6.69833I$	$-12.2764+10.3456I$
$u=\ \ 0.638463-0.472891I$ $a=\ \ 0.00841+1.58949I$ $b=-0.732835-0.165675I$	$-1.26211+6.69833I$	$-12.2764-10.3456I$
$u=\ \ 0.638463-0.472891I$ $a=-2.23392-0.77030I$ $b=-0.191691+0.277776I$	$-1.26211+6.69833I$	$-12.2764-10.3456I$
$u=\ \ 0.476081+0.547627I$ $a=\ \ 0.849827-0.724384I$ $b=\ \ 0.297746-0.578232I$	$2.91093-1.88971I$	$-0.44498+3.89733I$
$u=\ \ 0.476081+0.547627I$ $a=\ \ 1.08918-1.23722I$ $b=\ \ 0.547443-0.288098I$	$2.91093-1.88971I$	$-0.44498+3.89733I$
$u=\ \ 0.476081-0.547627I$ $a=\ \ 0.849827+0.724384I$ $b=\ \ 0.297746+0.578232I$	$2.91093+1.88971I$	$-0.44498-3.89733I$
$u=\ \ 0.476081-0.547627I$ $a=\ \ 1.08918+1.23722I$ $b=\ \ 0.547443+0.288098I$	$2.91093+1.88971I$	$-0.44498-3.89733I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.525223+0.491556I$ $a=-0.62016+1.42991I$ $b=\ \ 0.689553+1.077310I$	$2.43912+5.99758I$	$-1.93287-10.06250I$
$u=-0.525223+0.491556I$ $a=-2.07561-1.78920I$ $b=\ \ 0.191089-0.259118I$	$2.43912+5.99758I$	$-1.93287-10.06250I$
$u=-0.525223-0.491556I$ $a=-0.62016-1.42991I$ $b=\ \ 0.689553-1.077310I$	$2.43912-5.99758I$	$-1.93287+10.06250I$
$u=-0.525223-0.491556I$ $a=-2.07561+1.78920I$ $b=\ \ 0.191089+0.259118I$	$2.43912-5.99758I$	$-1.93287+10.06250I$
$u=\ \ 0.277580+0.662679I$ $a=\ \ 0.736054-0.530277I$ $b=\ \ 0.797040-0.685996I$	$3.79715+2.86775I$	$1.19785-3.30855I$
$u=\ \ 0.277580+0.662679I$ $a=\ \ 0.163136+0.349177I$ $b=-0.295111+0.682840I$	$3.79715+2.86775I$	$1.19785-3.30855I$
$u=\ \ 0.277580-0.662679I$ $a=\ \ 0.736054+0.530277I$ $b=\ \ 0.797040+0.685996I$	$3.79715-2.86775I$	$1.19785+3.30855I$
$u=\ \ 0.277580-0.662679I$ $a=\ \ 0.163136-0.349177I$ $b=-0.295111-0.682840I$	$3.79715-2.86775I$	$1.19785+3.30855I$
$u=-0.441250+0.489469I$ $a=-0.884679-0.035500I$ $b=-0.971326-0.931519I$	$2.68875-2.55506I$	$-0.147951+0.889172I$
$u=-0.441250+0.489469I$ $a=\ \ 2.35888+1.07821I$ $b=\ \ 0.371733-0.548181I$	$2.68875-2.55506I$	$-0.147951+0.889172I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.441250-0.489469I$ $a=-0.884679+0.035500I$ $b=-0.971326+0.931519I$	$2.68875+2.55506I$	$-0.147951-0.889172I$
$u=-0.441250-0.489469I$ $a=2.35888-1.07821I$ $b=0.371733+0.548181I$	$2.68875+2.55506I$	$-0.147951-0.889172I$
$u=0.195556+0.466781I$ $a=0.358284+0.485136I$ $b=-0.729100+0.903609I$	$-0.07204+3.38846I$	$-7.99570-4.25357I$
$u=0.195556+0.466781I$ $a=0.96362+1.74995I$ $b=0.805890+0.233688I$	$-0.07204+3.38846I$	$-7.99570-4.25357I$
$u=0.195556-0.466781I$ $a=0.358284-0.485136I$ $b=-0.729100-0.903609I$	$-0.07204-3.38846I$	$-7.99570+4.25357I$
$u=0.195556-0.466781I$ $a=0.96362-1.74995I$ $b=0.805890-0.233688I$	$-0.07204-3.38846I$	$-7.99570+4.25357I$
$u=-1.51268+0.13583I$ $a=-0.621893+0.392051I$ $b=-1.172090-0.041405I$	$-3.63443+4.26143I$	0
$u=-1.51268+0.13583I$ $a=-1.215730-0.406169I$ $b=-2.85058-1.22060I$	$-3.63443+4.26143I$	0
$u=-1.51268-0.13583I$ $a=-0.621893-0.392051I$ $b=-1.172090+0.041405I$	$-3.63443-4.26143I$	0
$u=-1.51268-0.13583I$ $a=-1.215730+0.406169I$ $b=-2.85058+1.22060I$	$-3.63443-4.26143I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.51779 + 0.11529I$ $a = -0.190719 + 1.045250I$ $b = 0.047370 + 0.888797I$	$-3.82932 + 0.52023I$	0
$u = 1.51779 + 0.11529I$ $a = -2.07253 + 0.17597I$ $b = -4.69665 + 0.02384I$	$-3.82932 + 0.52023I$	0
$u = 1.51779 - 0.11529I$ $a = -0.190719 - 1.045250I$ $b = 0.047370 - 0.888797I$	$-3.82932 - 0.52023I$	0
$u = 1.51779 - 0.11529I$ $a = -2.07253 - 0.17597I$ $b = -4.69665 - 0.02384I$	$-3.82932 - 0.52023I$	0
$u = -1.53311 + 0.06521I$ $a = -0.718843 + 0.254928I$ $b = -1.17807 + 1.78768I$	$-6.32420 - 2.55827I$	$-11.80080 + 5.60834I$
$u = -1.53311 + 0.06521I$ $a = 1.89671 + 1.84534I$ $b = 3.23347 + 3.48987I$	$-6.32420 - 2.55827I$	$-11.80080 + 5.60834I$
$u = -1.53311 - 0.06521I$ $a = -0.718843 - 0.254928I$ $b = -1.17807 - 1.78768I$	$-6.32420 + 2.55827I$	$-11.80080 - 5.60834I$
$u = -1.53311 - 0.06521I$ $a = 1.89671 - 1.84534I$ $b = 3.23347 - 3.48987I$	$-6.32420 + 2.55827I$	$-11.80080 - 5.60834I$
$u = 1.54485 + 0.13337I$ $a = 0.385384 + 0.615349I$ $b = 0.65878 + 2.45832I$	$-4.50128 - 8.20533I$	0
$u = 1.54485 + 0.13337I$ $a = 2.79157 - 0.12318I$ $b = 5.31687 - 0.42575I$	$-4.50128 - 8.20533I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.54485 - 0.13337I$ $a = 0.385384 - 0.615349I$ $b = 0.65878 - 2.45832I$	$-4.50128 + 8.20533I$	0
$u = 1.54485 - 0.13337I$ $a = 2.79157 + 0.12318I$ $b = 5.31687 + 0.42575I$	$-4.50128 + 8.20533I$	0
$u = -1.58137 + 0.13915I$ $a = -1.53160 - 1.51990I$ $b = -2.59358 - 2.56426I$	$-8.76037 + 8.95548I$	0
$u = -1.58137 + 0.13915I$ $a = 2.26630 - 0.09882I$ $b = 4.81897 - 0.31491I$	$-8.76037 + 8.95548I$	0
$u = -1.58137 - 0.13915I$ $a = -1.53160 + 1.51990I$ $b = -2.59358 + 2.56426I$	$-8.76037 - 8.95548I$	0
$u = -1.58137 - 0.13915I$ $a = 2.26630 + 0.09882I$ $b = 4.81897 + 0.31491I$	$-8.76037 - 8.95548I$	0
$u = 0.384702 + 0.130377I$ $a = 1.34643 + 1.15599I$ $b = -0.479286 + 1.191100I$	$0.28705 + 3.45586I$	$-12.59187 - 3.72340I$
$u = 0.384702 + 0.130377I$ $a = -0.33211 + 4.09606I$ $b = 0.594555 + 0.086997I$	$0.28705 + 3.45586I$	$-12.59187 - 3.72340I$
$u = 0.384702 - 0.130377I$ $a = 1.34643 - 1.15599I$ $b = -0.479286 - 1.191100I$	$0.28705 - 3.45586I$	$-12.59187 + 3.72340I$
$u = 0.384702 - 0.130377I$ $a = -0.33211 - 4.09606I$ $b = 0.594555 - 0.086997I$	$0.28705 - 3.45586I$	$-12.59187 + 3.72340I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.58992+0.17781I$ $a=\ \ 1.314390-0.220603I$ $b=\ \ 2.77301-0.55986I$	$-4.92419+9.89136I$	0
$u=-1.58992+0.17781I$ $a=-2.04710-0.00757I$ $b=-4.02959-0.25930I$	$-4.92419+9.89136I$	0
$u=-1.58992-0.17781I$ $a=\ \ 1.314390+0.220603I$ $b=\ \ 2.77301+0.55986I$	$-4.92419-9.89136I$	0
$u=-1.58992-0.17781I$ $a=-2.04710+0.00757I$ $b=-4.02959+0.25930I$	$-4.92419-9.89136I$	0
$u=\ \ 1.61834+0.05147I$ $a=\ \ 0.99213-1.13861I$ $b=\ \ 2.24075-2.24946I$	$-11.22110+0.25726I$	0
$u=\ \ 1.61834+0.05147I$ $a=-2.18543-0.68568I$ $b=-4.13160-0.81782I$	$-11.22110+0.25726I$	0
$u=\ \ 1.61834-0.05147I$ $a=\ \ 0.99213+1.13861I$ $b=\ \ 2.24075+2.24946I$	$-11.22110-0.25726I$	0
$u=\ \ 1.61834-0.05147I$ $a=-2.18543+0.68568I$ $b=-4.13160+0.81782I$	$-11.22110-0.25726I$	0
$u=\ \ 1.65747$ $a=\ \ 0.394240$ $b=\ \ 0.976487$	-10.1124	0
$u=\ \ 1.65747$ $a=-1.82785$ $b=-3.32748$	-10.1124	0

III.

$\boldsymbol{I_3^u = \langle u^{12}+u^{11}+\cdots+b+1,\ -u^{14}+u^{13}+\cdots+a+1,\ u^{15}-2u^{14}+\cdots+u^2+1\rangle}$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} u^{14} - u^{13} + \cdots - 2u - 1 \\ -u^{12} - u^{11} + \cdots - u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 3u^{14} - u^{13} + \cdots - u - 1 \\ 5u^{14} - 3u^{13} + \cdots - u - 3 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 5u^{14} - 4u^{13} + \cdots - 2u - 3 \\ 6u^{14} - 3u^{13} + \cdots - 3u - 5 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 2u^{14} - 2u^{13} + \cdots - u - 1 \\ 2u^{14} - u^{13} + \cdots - 2u - 2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 3u^{14} - u^{13} + \cdots - u - 3 \\ 5u^{14} - 2u^{13} + \cdots - 2u - 3 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^5 + 2u^3 + u \\ -u^7 + 3u^5 - 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -10u^{14} + 3u^{13} + 78u^{12} - 14u^{11} - 227u^{10} - u^9 + 307u^8 + 85u^7 - 202u^6 - 117u^5 + 54u^4 + 24u^3 + 18u^2 + 11u + 7$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3	$u^{15} - 4u^{14} + \cdots + 5u - 1$
c_2	$u^{15} + 11u^{14} + \cdots + 69u + 5$
c_4, c_8	$u^{15} - 2u^{13} + \cdots - u + 1$
c_5, c_9	$u^{15} - u^{14} + \cdots - 2u^2 + 1$
c_6, c_7	$u^{15} - 2u^{14} + \cdots + u^2 + 1$
c_{10}	$u^{15} + 2u^{14} + \cdots + 4u + 1$
c_{11}, c_{12}	$u^{15} + 2u^{14} + \cdots - u^2 - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3	$y^{15} + 12y^{14} + \cdots - 7y - 1$
c_2	$y^{15} + 5y^{14} + \cdots + 1201y - 25$
c_4, c_8	$y^{15} - 4y^{14} + \cdots + 5y - 1$
c_5, c_9	$y^{15} - 5y^{14} + \cdots + 4y - 1$
c_6, c_7, c_{11} c_{12}	$y^{15} - 18y^{14} + \cdots - 2y - 1$
c_{10}	$y^{15} - 2y^{14} + \cdots - 10y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.968088 + 0.372476I$ $a = -0.059767 + 0.569906I$ $b = 0.162535 + 0.150354I$	$-1.117930 + 0.672381I$	$-5.5717 - 15.5217I$
$u = 0.968088 - 0.372476I$ $a = -0.059767 - 0.569906I$ $b = 0.162535 - 0.150354I$	$-1.117930 - 0.672381I$	$-5.5717 + 15.5217I$
$u = -0.617443 + 0.491186I$ $a = -1.52967 - 0.80405I$ $b = 0.275235 + 0.217089I$	$0.46809 + 6.63284I$	$-5.87049 - 10.29818I$
$u = -0.617443 - 0.491186I$ $a = -1.52967 + 0.80405I$ $b = 0.275235 - 0.217089I$	$0.46809 - 6.63284I$	$-5.87049 + 10.29818I$
$u = -0.334963 + 0.434830I$ $a = 0.218876 + 0.780240I$ $b = -0.646634 - 0.822557I$	$1.34167 - 3.29522I$	$-2.79998 + 3.51950I$
$u = -0.334963 - 0.434830I$ $a = 0.218876 - 0.780240I$ $b = -0.646634 + 0.822557I$	$1.34167 + 3.29522I$	$-2.79998 - 3.51950I$
$u = -1.48976 + 0.10689I$ $a = -0.711932 - 0.669447I$ $b = -1.26873 - 2.07242I$	$-4.60411 + 5.60570I$	$-9.56653 - 7.15919I$
$u = -1.48976 - 0.10689I$ $a = -0.711932 + 0.669447I$ $b = -1.26873 + 2.07242I$	$-4.60411 - 5.60570I$	$-9.56653 + 7.15919I$
$u = 1.51063 + 0.09194I$ $a = -1.41929 + 0.71032I$ $b = -2.56043 + 0.38952I$	$-4.92279 + 1.66323I$	$-7.24786 - 5.12167I$
$u = 1.51063 - 0.09194I$ $a = -1.41929 - 0.71032I$ $b = -2.56043 - 0.38952I$	$-4.92279 - 1.66323I$	$-7.24786 + 5.12167I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.209564 + 0.438491I$ $a = -1.14877 - 1.22839I$ $b = -0.198242 - 0.661573I$	$1.25166 - 3.87018I$	$-2.48614 + 6.40598I$
$u = \quad 0.209564 - 0.438491I$ $a = -1.14877 + 1.22839I$ $b = -0.198242 + 0.661573I$	$1.25166 + 3.87018I$	$-2.48614 - 6.40598I$
$u = \quad 1.57469 + 0.14763I$ $a = \quad 2.00341 - 0.20449I$ $b = \quad 3.95483 - 0.13857I$	$-6.92174 - 8.98940I$	$-8.76043 + 7.91883I$
$u = \quad 1.57469 - 0.14763I$ $a = \quad 2.00341 + 0.20449I$ $b = \quad 3.95483 + 0.13857I$	$-6.92174 + 8.98940I$	$-8.76043 - 7.91883I$
$u = -1.64161$ $a = \quad 1.29429$ $b = \quad 2.56286$	-10.4681	-17.3940

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u - 14$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.618034$ $a = -1.92705 + 0.95106I$ $b = -0.427051 - 0.587785I$	-2.63189	-14.6180
$u = \quad 0.618034$ $a = -1.92705 - 0.95106I$ $b = -0.427051 + 0.587785I$	-2.63189	-14.6180
$u = -1.61803$ $a = \quad 1.42705 + 0.58779I$ $b = \quad 2.92705 + 0.95106I$	-10.5276	-12.3820
$u = -1.61803$ $a = \quad 1.42705 - 0.58779I$ $b = \quad 2.92705 - 0.95106I$	-10.5276	-12.3820

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3	$((u-1)^4)(u^{15}-4u^{14}+\cdots+5u-1)(u^{49}+8u^{48}+\cdots+17u-1)$ $\cdot(u^{70}-5u^{69}+\cdots+118u-11)$
c_2	$u^4(u^{15}+11u^{14}+\cdots+69u+5)(u^{35}-17u^{34}+\cdots-2u+4)^2$ $\cdot(u^{49}+26u^{48}+\cdots+11u+2)$
c_4, c_8	$(u^4+u^3+u^2+u+1)(u^{15}-2u^{13}+\cdots-u+1)(u^{49}+5u^{47}+\cdots+3u+1)$ $\cdot(u^{70}-2u^{69}+\cdots-3755u-389)$
c_5, c_9	$(u^4+u^3+u^2+u+1)(u^{15}-u^{14}+\cdots-2u^2+1)$ $\cdot(u^{49}-u^{48}+\cdots+27u^2+1)(u^{70}-4u^{69}+\cdots-u+1)$
c_6, c_7	$((u^2+u-1)^2)(u^{15}-2u^{14}+\cdots+u^2+1)(u^{35}+2u^{34}+\cdots+4u-1)^2$ $\cdot(u^{49}-5u^{48}+\cdots+17u+4)$
c_{10}	$((u^2+u-1)^2)(u^{15}+2u^{14}+\cdots+4u+1)$ $\cdot((u^{35}-8u^{34}+\cdots-34u-17)^2)(u^{49}-9u^{48}+\cdots-1017u+2272)$
c_{11}, c_{12}	$((u^2-u-1)^2)(u^{15}+2u^{14}+\cdots-u^2-1)(u^{35}+2u^{34}+\cdots+4u-1)^2$ $\cdot(u^{49}-5u^{48}+\cdots+17u+4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3	$((y-1)^4)(y^{15}+12y^{14}+\cdots-7y-1)(y^{49}-22y^{48}+\cdots+199y-1)$ $\cdot(y^{70}+23y^{69}+\cdots-3012y+121)$
c_2	$y^4(y^{15}+5y^{14}+\cdots+1201y-25)(y^{35}-5y^{34}+\cdots+268y-16)^2$ $\cdot(y^{49}+20y^{47}+\cdots+89y-4)$
c_4, c_8	$(y^4+y^3+y^2+y+1)(y^{15}-4y^{14}+\cdots+5y-1)$ $\cdot(y^{49}+10y^{48}+\cdots-9y-1)(y^{70}+4y^{69}+\cdots-6317691y+151321)$
c_5, c_9	$(y^4+y^3+y^2+y+1)(y^{15}-5y^{14}+\cdots+4y-1)$ $\cdot(y^{49}+25y^{48}+\cdots-54y-1)(y^{70}-16y^{69}+\cdots+9y+1)$
c_6, c_7, c_{11} c_{12}	$((y^2-3y+1)^2)(y^{15}-18y^{14}+\cdots-2y-1)$ $\cdot((y^{35}-40y^{34}+\cdots+12y-1)^2)(y^{49}-55y^{48}+\cdots+137y-16)$
c_{10}	$((y^2-3y+1)^2)(y^{15}-2y^{14}+\cdots-10y-1)$ $\cdot(y^{35}+8y^{34}+\cdots+884y-289)^2$ $\cdot(y^{49}+9y^{48}+\cdots-108326159y-5161984)$