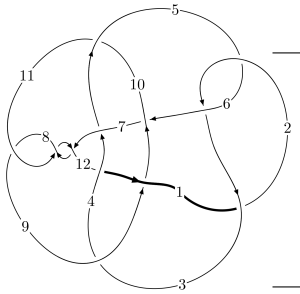
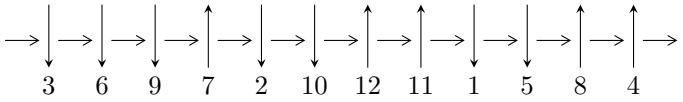
$12a_{0347}$ $(K12a_{0347})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -6.99189 \times 10^{50} u^{63} + 7.06651 \times 10^{51} u^{62} + \cdots + 5.23150 \times 10^{51} b + 4.68036 \times 10^{51},$$
$$3.28198 \times 10^{51} u^{63} - 3.59525 \times 10^{52} u^{62} + \cdots + 1.04630 \times 10^{52} a + 6.79922 \times 10^{51},\ u^{64} - 11u^{63} + \cdots - 7u + 1 \rangle$$
$$I_2^u = \langle u^{40} a - 23u^{40} + \cdots - 2a - 351,\ u^{40} a + u^{40} + \cdots + 2a^2 + 12a,\ u^{41} + 9u^{40} + \cdots - 2u - 2 \rangle$$
$$I_3^u = \langle u^{22} + 8u^{21} + \cdots + b + 5,\ -5u^{24} - 40u^{23} + \cdots + 3a - 28,\ u^{25} + 8u^{24} + \cdots + 32u + 3 \rangle$$
$$I_4^u = \langle au + 3b - 2a + u + 1,\ 2a^2 - au + 2a + 5,\ u^2 + 2 \rangle$$

$$I_1^v = \langle a,\ b + v,\ v^2 - v + 1 \rangle$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 177 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. $\boldsymbol{I_1^u = \langle -6.99 \times 10^{50} u^{63} + 7.07 \times 10^{51} u^{62} + \cdots + 5.23 \times 10^{51} b + 4.68 \times 10^{51},\ 3.28 \times 10^{51} u^{63} - 3.60 \times 10^{52} u^{62} + \cdots + 1.05 \times 10^{52} a + 6.80 \times 10^{51},\ u^{64} - 11 u^{63} + \cdots - 7u + 2 \rangle}$

(i) Arc colorings

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

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

$$a_5 = \begin{pmatrix} -0.313675u^{63} + 3.43616u^{62} + \cdots - 0.979049u - 0.649835 \\ 0.133650u^{63} - 1.35076u^{62} + \cdots + 2.88646u - 0.894649 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -0.447325u^{63} + 4.78692u^{62} + \cdots - 3.86551u + 0.244814 \\ 0.133650u^{63} - 1.35076u^{62} + \cdots + 2.88646u - 0.894649 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1.67303u^{63} - 17.6572u^{62} + \cdots + 0.940447u - 3.11259 \\ -0.746060u^{63} + 8.24220u^{62} + \cdots - 7.59861u + 3.34606 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -0.113300u^{63} + 1.19153u^{62} + \cdots - 2.35850u + 0.200252 \\ 0.0119472u^{63} - 0.0387449u^{62} + \cdots + 0.388066u + 0.0571673 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.313673u^{63} - 3.54242u^{62} + \cdots - 17.1019u + 2.42950 \\ 0.107084u^{63} - 1.16286u^{62} + \cdots - 2.46244u + 0.413177 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.321571u^{63} + 3.42748u^{62} + \cdots + 30.6898u - 2.41310 \\ 0.0791778u^{63} - 0.868562u^{62} + \cdots + 4.62645u - 0.699356 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.300016u^{63} - 3.26751u^{62} + \cdots - 28.0092u + 2.98991 \\ -0.0356783u^{63} + 0.359671u^{62} + \cdots - 3.75000u + 0.585720 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4.29495u^{63} + 46.7201u^{62} + \cdots - 27.3846u - 3.10996$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{64}+26u^{63}+\cdots+5617u+576$
c_2, c_5	$u^{64}+14u^{63}+\cdots+247u+24$
c_3, c_{10}	$u^{64}+4u^{62}+\cdots-60u+8$
c_4, c_{12}	$u^{64}+4u^{63}+\cdots-8u+1$
c_6, c_9	$u^{64}-u^{63}+\cdots+8u+3$
c_7, c_8, c_{11}	$u^{64}+11u^{63}+\cdots+7u+2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{64} + 26y^{63} + \cdots + 2583071y + 331776$
c_2, c_5	$y^{64} - 26y^{63} + \cdots - 5617y + 576$
c_3, c_{10}	$y^{64} + 8y^{63} + \cdots - 784y + 64$
c_4, c_{12}	$y^{64} + 52y^{63} + \cdots + 84y + 1$
c_6, c_9	$y^{64} - 21y^{63} + \cdots - 406y + 9$
c_7, c_8, c_{11}	$y^{64} + 61y^{63} + \cdots - 101y + 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.874586 + 0.463761I$ $a = -0.476193 + 0.497848I$ $b = 0.78291 + 1.18416I$	$0.1569 + 15.1946I$	0
$u = 0.874586 - 0.463761I$ $a = -0.476193 - 0.497848I$ $b = 0.78291 - 1.18416I$	$0.1569 - 15.1946I$	0
$u = -0.134967 + 0.969394I$ $a = -0.716869 - 0.325913I$ $b = -0.493479 + 0.152045I$	$-0.52369 - 1.36537I$	0
$u = -0.134967 - 0.969394I$ $a = -0.716869 + 0.325913I$ $b = -0.493479 - 0.152045I$	$-0.52369 + 1.36537I$	0
$u = 0.850863 + 0.422917I$ $a = 0.512533 - 0.435812I$ $b = -0.78408 - 1.19047I$	$1.85492 + 9.31414I$	0
$u = 0.850863 - 0.422917I$ $a = 0.512533 + 0.435812I$ $b = -0.78408 + 1.19047I$	$1.85492 - 9.31414I$	0
$u = 0.709244 + 0.777818I$ $a = -0.806471 + 0.011283I$ $b = -0.453682 + 0.916244I$	$0.81096 - 3.99682I$	0
$u = 0.709244 - 0.777818I$ $a = -0.806471 - 0.011283I$ $b = -0.453682 - 0.916244I$	$0.81096 + 3.99682I$	0
$u = -0.735026 + 0.753807I$ $a = -0.115505 + 0.397307I$ $b = 0.024188 + 0.229007I$	$1.58932 - 0.39154I$	0
$u = -0.735026 - 0.753807I$ $a = -0.115505 - 0.397307I$ $b = 0.024188 - 0.229007I$	$1.58932 + 0.39154I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.788162 + 0.760204I$ $a = 0.744165 - 0.029302I$ $b = 0.455272 - 0.927701I$	$-0.67770 - 9.59565I$	0
$u = 0.788162 - 0.760204I$ $a = 0.744165 + 0.029302I$ $b = 0.455272 + 0.927701I$	$-0.67770 + 9.59565I$	0
$u = -0.440914 + 1.021510I$ $a = -0.242910 - 0.322440I$ $b = -0.236295 - 0.093976I$	$-0.66096 - 1.51732I$	0
$u = -0.440914 - 1.021510I$ $a = -0.242910 + 0.322440I$ $b = -0.236295 + 0.093976I$	$-0.66096 + 1.51732I$	0
$u = 0.696005 + 0.540499I$ $a = 0.702429 + 0.180538I$ $b = 0.400897 - 0.949464I$	$-5.18239 - 2.82741I$	0
$u = 0.696005 - 0.540499I$ $a = 0.702429 - 0.180538I$ $b = 0.400897 + 0.949464I$	$-5.18239 + 2.82741I$	0
$u = 0.723846 + 0.467849I$ $a = -0.719138 + 0.533500I$ $b = 0.79941 + 1.17427I$	$-4.95307 + 7.52151I$	0
$u = 0.723846 - 0.467849I$ $a = -0.719138 - 0.533500I$ $b = 0.79941 - 1.17427I$	$-4.95307 - 7.52151I$	0
$u = -0.739683 + 0.881622I$ $a = 0.049686 - 0.386731I$ $b = -0.062673 - 0.221372I$	$1.22982 - 5.09618I$	0
$u = -0.739683 - 0.881622I$ $a = 0.049686 + 0.386731I$ $b = -0.062673 + 0.221372I$	$1.22982 + 5.09618I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.722796+0.102347I$ $a=-0.064511+0.695991I$ $b=-0.003282+0.295639I$	$2.14767-2.42621I$	$3.53989+3.29368I$
$u=-0.722796-0.102347I$ $a=-0.064511-0.695991I$ $b=-0.003282-0.295639I$	$2.14767+2.42621I$	$3.53989-3.29368I$
$u=0.661440+0.269912I$ $a=0.917801-0.108418I$ $b=-0.89574-1.23400I$	$0.94406+4.53969I$	$0.-14.5295I$
$u=0.661440-0.269912I$ $a=0.917801+0.108418I$ $b=-0.89574+1.23400I$	$0.94406-4.53969I$	$0.+14.5295I$
$u=0.679870+0.076087I$ $a=0.093571+0.624963I$ $b=0.256092-1.288630I$	$-0.92471+3.02354I$	$-8.64857-7.07719I$
$u=0.679870-0.076087I$ $a=0.093571-0.624963I$ $b=0.256092+1.288630I$	$-0.92471-3.02354I$	$-8.64857+7.07719I$
$u=-0.268005+1.298910I$ $a=0.302259+0.714643I$ $b=0.467658+0.320477I$	$-2.20651-5.99017I$	0
$u=-0.268005-1.298910I$ $a=0.302259-0.714643I$ $b=0.467658-0.320477I$	$-2.20651+5.99017I$	0
$u=-0.034395+1.366090I$ $a=-0.30955+1.70708I$ $b=0.593741+1.249710I$	$-6.03768+1.44933I$	0
$u=-0.034395-1.366090I$ $a=-0.30955-1.70708I$ $b=0.593741-1.249710I$	$-6.03768-1.44933I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.157239 + 0.608409I$ $a = -1.143040 - 0.086657I$ $b = -0.300221 + 0.624616I$	$-0.561743 - 1.227990I$	$-3.53833 + 4.98452I$
$u = 0.157239 - 0.608409I$ $a = -1.143040 + 0.086657I$ $b = -0.300221 - 0.624616I$	$-0.561743 + 1.227990I$	$-3.53833 - 4.98452I$
$u = 0.241711 + 1.354500I$ $a = -0.77684 + 1.53237I$ $b = 0.32898 + 1.48682I$	$-5.06349 + 0.11632I$	0
$u = 0.241711 - 1.354500I$ $a = -0.77684 - 1.53237I$ $b = 0.32898 - 1.48682I$	$-5.06349 - 0.11632I$	0
$u = 0.306940 + 1.366480I$ $a = 1.14500 - 1.25058I$ $b = 0.07904 - 1.54786I$	$-5.55346 + 6.70378I$	0
$u = 0.306940 - 1.366480I$ $a = 1.14500 + 1.25058I$ $b = 0.07904 + 1.54786I$	$-5.55346 - 6.70378I$	0
$u = -0.059218 + 1.403030I$ $a = 0.23543 - 1.74553I$ $b = -0.637721 - 1.254150I$	$-6.56627 - 2.85756I$	0
$u = -0.059218 - 1.403030I$ $a = 0.23543 + 1.74553I$ $b = -0.637721 + 1.254150I$	$-6.56627 + 2.85756I$	0
$u = 0.144268 + 1.398570I$ $a = 0.38334 + 2.17822I$ $b = 1.39453 + 1.28541I$	$-7.67530 + 1.01817I$	0
$u = 0.144268 - 1.398570I$ $a = 0.38334 - 2.17822I$ $b = 1.39453 - 1.28541I$	$-7.67530 - 1.01817I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.25341 + 1.41328I$ $a = 0.28026 - 2.17866I$ $b = -1.00687 - 1.69702I$	$-4.44780 + 7.86984I$	0
$u = 0.25341 - 1.41328I$ $a = 0.28026 + 2.17866I$ $b = -1.00687 + 1.69702I$	$-4.44780 - 7.86984I$	0
$u = -0.01743 + 1.45361I$ $a = 0.08383 - 1.68567I$ $b = -0.721594 - 1.179600I$	$-7.56672 + 1.96899I$	0
$u = -0.01743 - 1.45361I$ $a = 0.08383 + 1.68567I$ $b = -0.721594 + 1.179600I$	$-7.56672 - 1.96899I$	0
$u = 0.01724 + 1.45371I$ $a = -0.142654 + 1.399870I$ $b = 0.563785 + 1.020420I$	$-6.78319 - 0.76865I$	0
$u = 0.01724 - 1.45371I$ $a = -0.142654 - 1.399870I$ $b = 0.563785 - 1.020420I$	$-6.78319 + 0.76865I$	0
$u = 0.26333 + 1.49598I$ $a = -0.11458 + 1.96767I$ $b = 0.97438 + 1.50802I$	$-11.3104 + 11.1323I$	0
$u = 0.26333 - 1.49598I$ $a = -0.11458 - 1.96767I$ $b = 0.97438 - 1.50802I$	$-11.3104 - 11.1323I$	0
$u = 0.335524 + 0.328284I$ $a = -1.68394 + 0.68354I$ $b = 0.761604 + 0.863069I$	$-2.21510 - 0.83970I$	$-11.15859 + 0.95683I$
$u = 0.335524 - 0.328284I$ $a = -1.68394 - 0.68354I$ $b = 0.761604 - 0.863069I$	$-2.21510 + 0.83970I$	$-11.15859 - 0.95683I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.31619 + 1.49846I$ $a = 0.16485 - 1.89226I$ $b = -0.92185 - 1.50636I$	$-4.3452 + 13.5483I$	0
$u = 0.31619 - 1.49846I$ $a = 0.16485 + 1.89226I$ $b = -0.92185 + 1.50636I$	$-4.3452 - 13.5483I$	0
$u = 0.32072 + 1.51879I$ $a = -0.14001 + 1.87382I$ $b = 0.92245 + 1.49081I$	$-6.2511 + 19.5398I$	0
$u = 0.32072 - 1.51879I$ $a = -0.14001 - 1.87382I$ $b = 0.92245 - 1.49081I$	$-6.2511 - 19.5398I$	0
$u = 0.21935 + 1.53725I$ $a = 0.564830 - 1.084320I$ $b = -0.144261 - 1.091660I$	$-12.04140 + 0.55096I$	0
$u = 0.21935 - 1.53725I$ $a = 0.564830 + 1.084320I$ $b = -0.144261 + 1.091660I$	$-12.04140 - 0.55096I$	0
$u = 0.10218 + 1.55806I$ $a = -0.358935 + 1.114100I$ $b = 0.277530 + 0.977718I$	$-7.36626 - 1.42331I$	0
$u = 0.10218 - 1.55806I$ $a = -0.358935 - 1.114100I$ $b = 0.277530 - 0.977718I$	$-7.36626 + 1.42331I$	0
$u = 0.12566 + 1.62075I$ $a = 0.382955 - 1.012810I$ $b = -0.199811 - 0.934705I$	$-9.07622 - 6.32501I$	0
$u = 0.12566 - 1.62075I$ $a = 0.382955 + 1.012810I$ $b = -0.199811 + 0.934705I$	$-9.07622 + 6.32501I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.014952 + 0.260009I$ $a = 3.44771 - 1.44981I$ $b = -0.187548 - 0.937540I$	$-1.81865 + 2.11391I$	$-8.57768 - 4.29143I$
$u = 0.014952 - 0.260009I$ $a = 3.44771 + 1.44981I$ $b = -0.187548 + 0.937540I$	$-1.81865 - 2.11391I$	$-8.57768 + 4.29143I$
$u = -0.150277 + 0.053346I$ $a = 2.05049 - 7.58298I$ $b = -0.033361 - 1.087320I$	$-1.60253 - 2.06668I$	$-7.92019 + 3.31024I$
$u = -0.150277 - 0.053346I$ $a = 2.05049 + 7.58298I$ $b = -0.033361 + 1.087320I$	$-1.60253 + 2.06668I$	$-7.92019 - 3.31024I$

II. $I_2^u =$
$\langle u^{40}a-23u^{40}+\cdots-2a-351,\ u^{40}a+u^{40}+\cdots+2a^2+12a,\ u^{41}+9u^{40}+\cdots-2u-2\rangle$

(i) Arc colorings

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

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

$$a_5 = \begin{pmatrix} a \\ -0.00251889au^{40} + 0.0579345u^{40} + \cdots + 0.00503778a + 0.884131 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} 0.00251889au^{40} - 0.0579345u^{40} + \cdots + 0.994962a - 0.884131 \\ -0.00251889au^{40} + 0.0579345u^{40} + \cdots + 0.00503778a + 0.884131 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.0579345au^{40} - 0.167506u^{40} + \cdots - 0.884131a + 0.335013 \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 0.00755668au^{40} + 0.826196u^{40} + \cdots + 0.984887a + 0.347607 \\ -0.0100756au^{40} + 0.231738u^{40} + \cdots + 0.0201511a + 0.536524 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.942065au^{40} + 0.167506u^{40} + \cdots + 0.884131a - 1.33501 \\ 0.173804au^{40} + 0.00251889u^{40} + \cdots + 1.65239a + 0.994962 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.231738au^{40} - 0.170025u^{40} + \cdots - 0.536524a + 0.340050 \\ -0.478589au^{40} + 0.00755668u^{40} + \cdots + 0.957179a - 1.01511 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.362720au^{40} - 0.157431u^{40} + \cdots + 0.725441a + 0.314861 \\ 0.0730479au^{40} + 0.319899u^{40} + \cdots - 0.146096a - 0.639798 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -u^{40} - 9u^{39} + \cdots + 60u + 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{41}+18u^{40}+\cdots+8u+1)^2$
c_2, c_5	$(u^{41}-4u^{40}+\cdots-8u+1)^2$
c_3, c_{10}	$u^{82}-2u^{81}+\cdots+585u-107$
c_4, c_{12}	$u^{82}+10u^{81}+\cdots+3081u+397$
c_6, c_9	$u^{82}+3u^{81}+\cdots+14u-1$
c_7, c_8, c_{11}	$(u^{41}-9u^{40}+\cdots-2u+2)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{41}+14y^{40}+\cdots-64y-1)^2$
c_2, c_5	$(y^{41}-18y^{40}+\cdots+8y-1)^2$
c_3, c_{10}	$y^{82}-6y^{81}+\cdots-1905495y+11449$
c_4, c_{12}	$y^{82}-6y^{81}+\cdots+7892863y+157609$
c_6, c_9	$y^{82}+29y^{81}+\cdots+102y+1$
c_7, c_8, c_{11}	$(y^{41}+41y^{40}+\cdots+68y-4)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.895003+0.498727I$ $a=\ \ 0.228170+0.653764I$ $b=-0.364274+0.745503I$	$1.95527-0.57118I$	$6.04148+0.I$
$u=-0.895003+0.498727I$ $a=-0.180264+0.084965I$ $b=\ \ 0.484487-0.377574I$	$1.95527-0.57118I$	$6.04148+0.I$
$u=-0.895003-0.498727I$ $a=\ \ 0.228170-0.653764I$ $b=-0.364274-0.745503I$	$1.95527+0.57118I$	$6.04148+0.I$
$u=-0.895003-0.498727I$ $a=-0.180264-0.084965I$ $b=\ \ 0.484487+0.377574I$	$1.95527+0.57118I$	$6.04148+0.I$
$u=-0.886395+0.578180I$ $a=-0.301896-0.711282I$ $b=\ \ 0.362364-0.753908I$	$1.72494-5.25730I$	$0.+10.31079I$
$u=-0.886395+0.578180I$ $a=\ \ 0.1118320+0.0122452I$ $b=-0.564151+0.421846I$	$1.72494-5.25730I$	$0.+10.31079I$
$u=-0.886395-0.578180I$ $a=-0.301896+0.711282I$ $b=\ \ 0.362364+0.753908I$	$1.72494+5.25730I$	$0.-10.31079I$
$u=-0.886395-0.578180I$ $a=\ \ 0.1118320-0.0122452I$ $b=-0.564151-0.421846I$	$1.72494+5.25730I$	$0.-10.31079I$
$u=-0.419922+0.819685I$ $a=\ \ 0.014090-0.384363I$ $b=\ \ 0.885747-0.743602I$	$-0.98956-6.71493I$	$-5.68486+9.93728I$
$u=-0.419922+0.819685I$ $a=\ \ 1.08553+1.35316I$ $b=-0.071565+0.865337I$	$-0.98956-6.71493I$	$-5.68486+9.93728I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.419922-0.819685I$ $a=0.014090+0.384363I$ $b=0.885747+0.743602I$	$-0.98956+6.71493I$	$-5.68486-9.93728I$
$u=-0.419922-0.819685I$ $a=1.08553-1.35316I$ $b=-0.071565-0.865337I$	$-0.98956+6.71493I$	$-5.68486-9.93728I$
$u=-0.611668+0.673550I$ $a=-0.897282-0.800935I$ $b=0.202337-0.749422I$	$0.11262-2.09272I$	$-3.43576+6.46528I$
$u=-0.611668+0.673550I$ $a=0.051980+0.320022I$ $b=-0.707298+0.709139I$	$0.11262-2.09272I$	$-3.43576+6.46528I$
$u=-0.611668-0.673550I$ $a=-0.897282+0.800935I$ $b=0.202337+0.749422I$	$0.11262+2.09272I$	$-3.43576-6.46528I$
$u=-0.611668-0.673550I$ $a=0.051980-0.320022I$ $b=-0.707298-0.709139I$	$0.11262+2.09272I$	$-3.43576-6.46528I$
$u=0.010846+1.176660I$ $a=0.220167-0.103332I$ $b=1.194090-0.448882I$	$-0.81120-6.28000I$	0
$u=0.010846+1.176660I$ $a=0.78926+2.16046I$ $b=0.417158+1.142220I$	$-0.81120-6.28000I$	0
$u=0.010846-1.176660I$ $a=0.220167+0.103332I$ $b=1.194090+0.448882I$	$-0.81120+6.28000I$	0
$u=0.010846-1.176660I$ $a=0.78926-2.16046I$ $b=0.417158-1.142220I$	$-0.81120+6.28000I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.818516+0.080588I$ $a=-0.136568+0.739988I$ $b=\ \ 0.072690-0.231754I$	$2.05960-2.48926I$	$5.05170+3.34988I$
$u=-0.818516+0.080588I$ $a=\ \ 0.022594+0.540489I$ $b=-0.092970+0.812250I$	$2.05960-2.48926I$	$5.05170+3.34988I$
$u=-0.818516-0.080588I$ $a=-0.136568-0.739988I$ $b=\ \ 0.072690+0.231754I$	$2.05960+2.48926I$	$5.05170-3.34988I$
$u=-0.818516-0.080588I$ $a=\ \ 0.022594-0.540489I$ $b=-0.092970-0.812250I$	$2.05960+2.48926I$	$5.05170-3.34988I$
$u=-0.639274+0.516374I$ $a=-0.896282-0.287979I$ $b=\ \ 0.226609-0.614971I$	$0.01587-2.19785I$	$-4.62987+3.78431I$
$u=-0.639274+0.516374I$ $a=\ \ 0.135764+0.379991I$ $b=-0.548985+0.788868I$	$0.01587-2.19785I$	$-4.62987+3.78431I$
$u=-0.639274-0.516374I$ $a=-0.896282+0.287979I$ $b=\ \ 0.226609+0.614971I$	$0.01587+2.19785I$	$-4.62987-3.78431I$
$u=-0.639274-0.516374I$ $a=\ \ 0.135764-0.379991I$ $b=-0.548985-0.788868I$	$0.01587+2.19785I$	$-4.62987-3.78431I$
$u=\ \ 0.060616+1.245240I$ $a=-0.478038-0.113422I$ $b=-1.341780+0.294249I$	$0.518741-0.467338I$	0
$u=\ \ 0.060616+1.245240I$ $a=-0.74342-2.13731I$ $b=-0.560003-1.050850I$	$0.518741-0.467338I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.060616 - 1.245240I$ $a = -0.478038 + 0.113422I$ $b = -1.341780 - 0.294249I$	$0.518741 + 0.467338I$	0
$u = 0.060616 - 1.245240I$ $a = -0.74342 + 2.13731I$ $b = -0.560003 + 1.050850I$	$0.518741 + 0.467338I$	0
$u = 0.051790 + 1.355640I$ $a = 1.67533 + 0.89402I$ $b = 2.07461 + 0.45198I$	$-6.82732 + 1.10901I$	0
$u = 0.051790 + 1.355640I$ $a = 0.22861 + 2.03380I$ $b = 0.619918 + 0.518382I$	$-6.82732 + 1.10901I$	0
$u = 0.051790 - 1.355640I$ $a = 1.67533 - 0.89402I$ $b = 2.07461 - 0.45198I$	$-6.82732 - 1.10901I$	0
$u = 0.051790 - 1.355640I$ $a = 0.22861 - 2.03380I$ $b = 0.619918 - 0.518382I$	$-6.82732 - 1.10901I$	0
$u = 0.113233 + 1.355730I$ $a = -1.392110 + 0.006299I$ $b = -1.97238 + 0.29182I$	$-0.56183 + 4.07949I$	0
$u = 0.113233 + 1.355730I$ $a = -0.54589 - 2.21697I$ $b = -0.452801 - 0.754352I$	$-0.56183 + 4.07949I$	0
$u = 0.113233 - 1.355730I$ $a = -1.392110 - 0.006299I$ $b = -1.97238 - 0.29182I$	$-0.56183 - 4.07949I$	0
$u = 0.113233 - 1.355730I$ $a = -0.54589 + 2.21697I$ $b = -0.452801 + 0.754352I$	$-0.56183 - 4.07949I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.121620 + 1.382840I$ $a = 1.54321 - 0.21411I$ $b = 2.09745 - 0.43998I$	$-2.70065 + 9.94272I$	0
$u = 0.121620 + 1.382840I$ $a = 0.56310 + 2.27185I$ $b = 0.379745 + 0.738954I$	$-2.70065 + 9.94272I$	0
$u = 0.121620 - 1.382840I$ $a = 1.54321 + 0.21411I$ $b = 2.09745 + 0.43998I$	$-2.70065 - 9.94272I$	0
$u = 0.121620 - 1.382840I$ $a = 0.56310 - 2.27185I$ $b = 0.379745 - 0.738954I$	$-2.70065 - 9.94272I$	0
$u = -0.11243 + 1.47381I$ $a = 0.94793 + 1.14508I$ $b = -0.448256 + 0.644032I$	$-9.88760 - 1.87876I$	0
$u = -0.11243 + 1.47381I$ $a = 0.43790 - 2.27062I$ $b = 0.89542 - 2.00137I$	$-9.88760 - 1.87876I$	0
$u = -0.11243 - 1.47381I$ $a = 0.94793 - 1.14508I$ $b = -0.448256 - 0.644032I$	$-9.88760 + 1.87876I$	0
$u = -0.11243 - 1.47381I$ $a = 0.43790 + 2.27062I$ $b = 0.89542 + 2.00137I$	$-9.88760 + 1.87876I$	0
$u = -0.19812 + 1.48876I$ $a = -0.474902 - 1.143990I$ $b = 0.596565 - 0.804826I$	$-6.49780 - 5.13988I$	0
$u = -0.19812 + 1.48876I$ $a = -0.13362 + 1.85101I$ $b = -0.71721 + 1.52796I$	$-6.49780 - 5.13988I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.19812-1.48876I$ $a=-0.474902+1.143990I$ $b=\ \ 0.596565+0.804826I$	$-6.49780+5.13988I$	0
$u=-0.19812-1.48876I$ $a=-0.13362-1.85101I$ $b=-0.71721-1.52796I$	$-6.49780+5.13988I$	0
$u=-0.32440+1.49994I$ $a=\ \ 0.053639-0.997050I$ $b=\ \ 0.898273-0.879292I$	$-4.41110-4.99632I$	0
$u=-0.32440+1.49994I$ $a=\ \ 0.23313+1.67970I$ $b=-0.450628+1.228700I$	$-4.41110-4.99632I$	0
$u=-0.32440-1.49994I$ $a=\ \ 0.053639+0.997050I$ $b=\ \ 0.898273+0.879292I$	$-4.41110+4.99632I$	0
$u=-0.32440-1.49994I$ $a=\ \ 0.23313-1.67970I$ $b=-0.450628-1.228700I$	$-4.41110+4.99632I$	0
$u=\ \ 0.427131+0.126572I$ $a=-0.850674-1.066150I$ $b=\ \ 1.32158-0.58582I$	$2.16617+8.04413I$	$3.23482-9.57385I$
$u=\ \ 0.427131+0.126572I$ $a=-1.60367+2.58379I$ $b=\ \ 0.867044+0.480110I$	$2.16617+8.04413I$	$3.23482-9.57385I$
$u=\ \ 0.427131-0.126572I$ $a=-0.850674+1.066150I$ $b=\ \ 1.32158+0.58582I$	$2.16617-8.04413I$	$3.23482+9.57385I$
$u=\ \ 0.427131-0.126572I$ $a=-1.60367-2.58379I$ $b=\ \ 0.867044-0.480110I$	$2.16617-8.04413I$	$3.23482+9.57385I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.219482+0.374158I$ $a=-0.077285-0.434566I$ $b=\ \ 0.90234-1.26494I$	$-3.72236-0.49265I$	$-14.4012+8.8169I$
$u=-0.219482+0.374158I$ $a=\ \ 3.66345+0.86758I$ $b=\ \ 0.095682+0.548786I$	$-3.72236-0.49265I$	$-14.4012+8.8169I$
$u=-0.219482-0.374158I$ $a=-0.077285+0.434566I$ $b=\ \ 0.90234+1.26494I$	$-3.72236+0.49265I$	$-14.4012-8.8169I$
$u=-0.219482-0.374158I$ $a=\ \ 3.66345-0.86758I$ $b=\ \ 0.095682-0.548786I$	$-3.72236+0.49265I$	$-14.4012-8.8169I$
$u=-0.16366+1.55976I$ $a=\ \ 0.57780+1.45391I$ $b=-0.425868+0.876727I$	$-8.69063-9.00195I$	0
$u=-0.16366+1.55976I$ $a=\ \ 0.48022-1.68275I$ $b=\ \ 1.06453-1.47103I$	$-8.69063-9.00195I$	0
$u=-0.16366-1.55976I$ $a=\ \ 0.57780-1.45391I$ $b=-0.425868-0.876727I$	$-8.69063+9.00195I$	0
$u=-0.16366-1.55976I$ $a=\ \ 0.48022+1.68275I$ $b=\ \ 1.06453+1.47103I$	$-8.69063+9.00195I$	0
$u=\ \ 0.423290+0.074566I$ $a=\ \ 1.08364+1.12062I$ $b=-1.267640+0.504067I$	$3.99395+2.22617I$	$7.06416-3.62614I$
$u=\ \ 0.423290+0.074566I$ $a=\ \ 1.75182-2.10296I$ $b=-0.949298-0.436305I$	$3.99395+2.22617I$	$7.06416-3.62614I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.423290 - 0.074566I$ $a = 1.08364 - 1.12062I$ $b = -1.267640 - 0.504067I$	$3.99395 - 2.22617I$	$7.06416 + 3.62614I$
$u = 0.423290 - 0.074566I$ $a = 1.75182 + 2.10296I$ $b = -0.949298 + 0.436305I$	$3.99395 - 2.22617I$	$7.06416 + 3.62614I$
$u = -0.32810 + 1.54346I$ $a = -0.169998 + 1.063150I$ $b = -0.956224 + 0.939190I$	$-5.09204 - 9.73833I$	0
$u = -0.32810 + 1.54346I$ $a = -0.25890 - 1.64183I$ $b = 0.449285 - 1.172840I$	$-5.09204 - 9.73833I$	0
$u = -0.32810 - 1.54346I$ $a = -0.169998 - 1.063150I$ $b = -0.956224 - 0.939190I$	$-5.09204 + 9.73833I$	0
$u = -0.32810 - 1.54346I$ $a = -0.25890 + 1.64183I$ $b = 0.449285 + 1.172840I$	$-5.09204 + 9.73833I$	0
$u = -0.24479 + 1.56149I$ $a = -0.22945 + 1.41041I$ $b = -0.92367 + 1.19156I$	$-7.15140 - 5.46612I$	0
$u = -0.24479 + 1.56149I$ $a = -0.32361 - 1.49103I$ $b = 0.511679 - 1.030450I$	$-7.15140 - 5.46612I$	0
$u = -0.24479 - 1.56149I$ $a = -0.22945 - 1.41041I$ $b = -0.92367 - 1.19156I$	$-7.15140 + 5.46612I$	0
$u = -0.24479 - 1.56149I$ $a = -0.32361 + 1.49103I$ $b = 0.511679 + 1.030450I$	$-7.15140 + 5.46612I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.306458$ $a = -1.21310$ $b = \ \ 1.54542$	-2.52366	12.9440
$u = \ \ 0.306458$ $a = -4.19749$ $b = \ \ 0.845371$	-2.52366	12.9440

III. $I_3^u =$
$\langle u^{22}+8u^{21}+\cdots+b+5,\ -5u^{24}-40u^{23}+\cdots+3a-28,\ u^{25}+8u^{24}+\cdots+32u+3\rangle$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{5}{3}u^{24} + \frac{40}{3}u^{23} + \cdots + 50u + \frac{28}{3} \\ -u^{22} - 8u^{21} + \cdots - 39u - 5 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{5}{3}u^{24} + \frac{40}{3}u^{23} + \cdots + 89u + \frac{43}{3} \\ -u^{22} - 8u^{21} + \cdots - 39u - 5 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{3}u^{24} - \frac{8}{3}u^{23} + \cdots - 77u - \frac{44}{3} \\ -u^{23} - 7u^{22} + \cdots - 3u + 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{5}{3}u^{24} + \frac{40}{3}u^{23} + \cdots + 75u + \frac{37}{3} \\ -u^{23} - 8u^{22} + \cdots - 42u - 5 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -\frac{1}{3}u^{24} - \frac{8}{3}u^{23} + \cdots - 52u - \frac{26}{3} \\ u^3 + u^2 + 2u + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} \frac{1}{3}u^{24} + \frac{8}{3}u^{23} + \cdots + 47u + \frac{23}{3} \\ -u^6 - 2u^5 - 5u^4 - 6u^3 - 6u^2 - 4u - 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} \frac{1}{3}u^{24} + \frac{8}{3}u^{23} + \cdots + 43u + \frac{17}{3} \\ u^{12} + 3u^{11} + \cdots - 2u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes
$= 3u^{24} + 22u^{23} + 109u^{22} + 388u^{21} + 1105u^{20} + 2575u^{19} + 5015u^{18} + 8151u^{17} + 10861u^{16} + 11103u^{15} + 6569u^{14} - 4034u^{13} - 19705u^{12} - 36760u^{11} - 50147u^{10} - 55645u^9 - 52088u^8 - 41626u^7 - 28506u^6 - 16633u^5 - 8210u^4 - 3352u^3 - 1100u^2 - 264u - 45$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{25} - 11u^{24} + \cdots + 181u - 25$
c_2	$u^{25} + 5u^{24} + \cdots - 19u - 5$
c_3, c_{10}	$u^{25} - 4u^{23} + \cdots + 2u - 1$
c_4, c_{12}	$u^{25} - 2u^{24} + \cdots - 5u^2 - 1$
c_5	$u^{25} - 5u^{24} + \cdots - 19u + 5$
c_6, c_9	$u^{25} - u^{24} + \cdots - 2u - 1$
c_7, c_8	$u^{25} + 8u^{24} + \cdots + 32u + 3$
c_{11}	$u^{25} - 8u^{24} + \cdots + 32u - 3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{25} + 9y^{24} + \cdots - 6839y - 625$
c_2, c_5	$y^{25} - 11y^{24} + \cdots + 181y - 25$
c_3, c_{10}	$y^{25} - 8y^{24} + \cdots + 6y - 1$
c_4, c_{12}	$y^{25} - 4y^{24} + \cdots - 10y - 1$
c_6, c_9	$y^{25} + 19y^{24} + \cdots - 4y - 1$
c_7, c_8, c_{11}	$y^{25} + 24y^{24} + \cdots + 70y - 9$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.576444+0.969341I$ $a=\ 0.379668+0.209239I$ $b=\ 0.054711+0.458924I$	$-1.02619-1.43748I$	$-16.2333-2.9546I$
$u=-0.576444-0.969341I$ $a=\ 0.379668-0.209239I$ $b=\ 0.054711-0.458924I$	$-1.02619+1.43748I$	$-16.2333+2.9546I$
$u=-0.931888+0.672170I$ $a=-0.264572-0.316082I$ $b=\ 0.240368-0.658525I$	$1.25319-0.89811I$	$-6.98325+4.85594I$
$u=-0.931888-0.672170I$ $a=-0.264572+0.316082I$ $b=\ 0.240368+0.658525I$	$1.25319+0.89811I$	$-6.98325-4.85594I$
$u=-0.784209+0.325897I$ $a=-0.438102-0.122877I$ $b=\ 0.442828-0.883870I$	$0.72959-3.41642I$	$-1.89603+7.39585I$
$u=-0.784209-0.325897I$ $a=-0.438102+0.122877I$ $b=\ 0.442828+0.883870I$	$0.72959+3.41642I$	$-1.89603-7.39585I$
$u=-0.891055+0.802899I$ $a=\ 0.267624+0.346611I$ $b=-0.200681+0.616389I$	$0.90295-5.48733I$	$-9.1395+11.3352I$
$u=-0.891055-0.802899I$ $a=\ 0.267624-0.346611I$ $b=-0.200681-0.616389I$	$0.90295+5.48733I$	$-9.1395-11.3352I$
$u=\ 0.009100+1.204320I$ $a=\ 1.11578-1.19339I$ $b=\ 1.241870-0.161249I$	$0.55437+2.06439I$	$0.56220-5.61553I$
$u=\ 0.009100-1.204320I$ $a=\ 1.11578+1.19339I$ $b=\ 1.241870+0.161249I$	$0.55437-2.06439I$	$0.56220+5.61553I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.077572 + 1.251490I$ $a = -0.99205 + 1.20898I$ $b = -1.154850 + 0.276108I$	$-1.60934 + 8.24258I$	$-3.95853 - 7.30408I$
$u = 0.077572 - 1.251490I$ $a = -0.99205 - 1.20898I$ $b = -1.154850 - 0.276108I$	$-1.60934 - 8.24258I$	$-3.95853 + 7.30408I$
$u = -0.024404 + 0.675855I$ $a = 0.67742 - 1.33114I$ $b = 0.846931 - 0.084135I$	$2.57567 - 2.05291I$	$0.29912 + 2.44445I$
$u = -0.024404 - 0.675855I$ $a = 0.67742 + 1.33114I$ $b = 0.846931 + 0.084135I$	$2.57567 + 2.05291I$	$0.29912 - 2.44445I$
$u = -0.120437 + 1.387100I$ $a = -0.69250 + 1.93112I$ $b = -1.45966 + 0.94542I$	$-7.68290 - 1.31345I$	$-16.2154 + 12.2980I$
$u = -0.120437 - 1.387100I$ $a = -0.69250 - 1.93112I$ $b = -1.45966 - 0.94542I$	$-7.68290 + 1.31345I$	$-16.2154 - 12.2980I$
$u = 0.086133 + 0.537197I$ $a = -0.94595 + 1.72487I$ $b = -0.877275 + 0.102818I$	$1.02130 - 7.51968I$	$-3.42239 + 6.83772I$
$u = 0.086133 - 0.537197I$ $a = -0.94595 - 1.72487I$ $b = -0.877275 - 0.102818I$	$1.02130 + 7.51968I$	$-3.42239 - 6.83772I$
$u = -0.29046 + 1.43058I$ $a = -0.48507 - 1.62567I$ $b = 0.56192 - 1.44547I$	$-4.88048 - 7.25668I$	$-6.48725 + 7.01686I$
$u = -0.29046 - 1.43058I$ $a = -0.48507 + 1.62567I$ $b = 0.56192 + 1.44547I$	$-4.88048 + 7.25668I$	$-6.48725 - 7.01686I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.19019+1.57688I$ $a=-0.124245+1.364400I$ $b=-0.776904+0.950431I$	$-7.22545-8.96892I$	$-5.89690+8.58792I$
$u=-0.19019-1.57688I$ $a=-0.124245-1.364400I$ $b=-0.776904-0.950431I$	$-7.22545+8.96892I$	$-5.89690-8.58792I$
$u=-0.25892+1.57684I$ $a=-0.026557-1.314760I$ $b=\ \ 0.662871-1.007580I$	$-6.21776-5.03899I$	$-3.59021+1.71413I$
$u=-0.25892-1.57684I$ $a=-0.026557+1.314760I$ $b=\ \ 0.662871+1.007580I$	$-6.21776+5.03899I$	$-3.59021-1.71413I$
$u=-0.209597$ $a=\ \ 4.39046$ $b=-1.16425$	-2.84804	-18.0770

IV. $I_4^u = \langle au + 3b - 2a + u + 1,\ 2a^2 - au + 2a + 5,\ u^2 + 2 \rangle$

(i) Arc colorings

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

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

$$a_5 = \begin{pmatrix} a \\ -\frac{1}{3}au + \frac{2}{3}a - \frac{1}{3}u - \frac{1}{3} \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} \frac{1}{3}au + \frac{1}{3}a + \frac{1}{3}u + \frac{1}{3} \\ -\frac{1}{3}au + \frac{2}{3}a - \frac{1}{3}u - \frac{1}{3} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -\frac{1}{3}au - \frac{1}{3}a + \frac{1}{6}u + \frac{2}{3} \\ 1 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} a \\ -\frac{1}{3}au + \frac{2}{3}a - \frac{1}{3}u - \frac{1}{3} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{3}au + \frac{1}{3}a - \frac{1}{6}u - \frac{5}{3} \\ -1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{3}au + \frac{1}{3}a - \frac{1}{6}u - \frac{2}{3} \\ -1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{3}au + \frac{2}{3}a + \frac{1}{6}u + \frac{2}{3} \\ -\frac{1}{3}au + \frac{2}{3}a - \frac{1}{3}u + \frac{2}{3} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_9	$(y-1)^4$
c_3, c_4, c_{10} c_{12}	$y^4 + 2y^3 + 7y^2 + 14y + 9$
c_7, c_8, c_{11}	$(y+2)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.414210I$ $a = -0.385607 - 1.191790I$ $b = -1.15222 - 1.08415I$	-8.22467	-12.0000
$u = 1.414210I$ $a = -0.61439 + 1.89890I$ $b = 0.152220 + 1.084150I$	-8.22467	-12.0000
$u = -1.414210I$ $a = -0.385607 + 1.191790I$ $b = -1.15222 + 1.08415I$	-8.22467	-12.0000
$u = -1.414210I$ $a = -0.61439 - 1.89890I$ $b = 0.152220 - 1.084150I$	-8.22467	-12.0000

V. $I_1^v = \langle a,\ b+v,\ v^2-v+1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 0.500000 + 0.866025I$		
$a = 0$	-3.28987	-6.00000
$b = -0.500000 - 0.866025I$		
$v = 0.500000 - 0.866025I$		
$a = 0$	-3.28987	-6.00000
$b = -0.500000 + 0.866025I$		

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^6)(u^{25}-11u^{24}+\cdots+181u-25)$ $\cdot((u^{41}+18u^{40}+\cdots+8u+1)^2)(u^{64}+26u^{63}+\cdots+5617u+576)$
c_2	$((u-1)^6)(u^{25}+5u^{24}+\cdots-19u-5)(u^{41}-4u^{40}+\cdots-8u+1)^2$ $\cdot(u^{64}+14u^{63}+\cdots+247u+24)$
c_3, c_{10}	$(u^2-u+1)(u^4+2u^3+\cdots+2u+3)(u^{25}-4u^{23}+\cdots+2u-1)$ $\cdot(u^{64}+4u^{62}+\cdots-60u+8)(u^{82}-2u^{81}+\cdots+585u-107)$
c_4, c_{12}	$(u^2-u+1)(u^4-2u^3+\cdots-2u+3)(u^{25}-2u^{24}+\cdots-5u^2-1)$ $\cdot(u^{64}+4u^{63}+\cdots-8u+1)(u^{82}+10u^{81}+\cdots+3081u+397)$
c_5	$((u+1)^6)(u^{25}-5u^{24}+\cdots-19u+5)(u^{41}-4u^{40}+\cdots-8u+1)^2$ $\cdot(u^{64}+14u^{63}+\cdots+247u+24)$
c_6, c_9	$((u-1)^2)(u+1)^4(u^{25}-u^{24}+\cdots-2u-1)(u^{64}-u^{63}+\cdots+8u+3)$ $\cdot(u^{82}+3u^{81}+\cdots+14u-1)$
c_7, c_8	$u^2(u^2+2)^2(u^{25}+8u^{24}+\cdots+32u+3)(u^{41}-9u^{40}+\cdots-2u+2)^2$ $\cdot(u^{64}+11u^{63}+\cdots+7u+2)$
c_{11}	$u^2(u^2+2)^2(u^{25}-8u^{24}+\cdots+32u-3)(u^{41}-9u^{40}+\cdots-2u+2)^2$ $\cdot(u^{64}+11u^{63}+\cdots+7u+2)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^6)(y^{25}+9y^{24}+\cdots-6839y-625)$ $\cdot(y^{41}+14y^{40}+\cdots-64y-1)^2$ $\cdot(y^{64}+26y^{63}+\cdots+2583071y+331776)$
c_2, c_5	$((y-1)^6)(y^{25}-11y^{24}+\cdots+181y-25)$ $\cdot((y^{41}-18y^{40}+\cdots+8y-1)^2)(y^{64}-26y^{63}+\cdots-5617y+576)$
c_3, c_{10}	$(y^2+y+1)(y^4+2y^3+\cdots+14y+9)(y^{25}-8y^{24}+\cdots+6y-1)$ $\cdot(y^{64}+8y^{63}+\cdots-784y+64)(y^{82}-6y^{81}+\cdots-1905495y+11449)$
c_4, c_{12}	$(y^2+y+1)(y^4+2y^3+\cdots+14y+9)(y^{25}-4y^{24}+\cdots-10y-1)$ $\cdot(y^{64}+52y^{63}+\cdots+84y+1)(y^{82}-6y^{81}+\cdots+7892863y+157609)$
c_6, c_9	$((y-1)^6)(y^{25}+19y^{24}+\cdots-4y-1)(y^{64}-21y^{63}+\cdots-406y+9)$ $\cdot(y^{82}+29y^{81}+\cdots+102y+1)$
c_7, c_8, c_{11}	$y^2(y+2)^4(y^{25}+24y^{24}+\cdots+70y-9)$ $\cdot((y^{41}+41y^{40}+\cdots+68y-4)^2)(y^{64}+61y^{63}+\cdots-101y+4)$