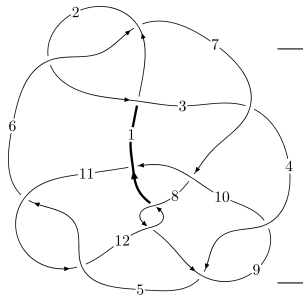
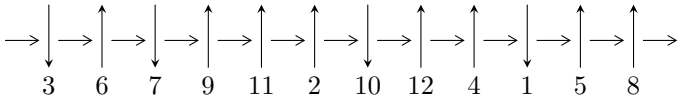
$12a_{0223}$ $(K12a_{0223})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 769u^{45} + 22195u^{44} + \cdots + 2048b + 18618368,\ -1645u^{45} - 50133u^{44} + \cdots + 8192a - 21766144,$$
$$u^{46} + 29u^{45} + \cdots + 172032u + 8192\rangle$$
$$I_2^u = \langle -5.15204 \times 10^{18}a^{19}u^2 - 9.61919 \times 10^{18}a^{18}u^2 + \cdots - 5.70417 \times 10^{21}a - 2.02099 \times 10^{21},$$
$$-2a^{19}u^2 - 5a^{18}u^2 + \cdots + 389a + 155,\ u^3 - u^2 + 2u - 1\rangle$$
$$I_3^u = \langle 4u^{29} + u^{28} + \cdots + b + 33,\ -29u^{29} + 70u^{28} + \cdots + 2a - 55,\ u^{30} - 2u^{29} + \cdots + u + 2\rangle$$
$$I_4^u = \langle 67a^5u^2 + 102a^4u^2 + \cdots + 362a + 422,\ -2a^4u^2 - 2a^3u^2 + \cdots - 11a + 1,\ u^3 - u^2 + 2u - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 154 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. $\boldsymbol{I_1^u = \langle 769u^{45} + 22195u^{44} + \cdots + 2048b + 18618368,\ -1645u^{45} - 5.01 \times 10^4 u^{44} + \cdots + 8192a - 2.18 \times 10^7,\ u^{46} + 29u^{45} + \cdots + 172032u + 8192\rangle}$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} 0.200806u^{45} + 6.11975u^{44} + \cdots + 46599.5u + 2657 \\ -0.375488u^{45} - 10.8374u^{44} + \cdots - 180404u - 9091 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -1.40613u^{45} - 39.1708u^{44} + \cdots - 186438.u - 8862 \\ -0.296387u^{45} - 7.36377u^{44} + \cdots + 31888u + 1645 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{8192}u^{45} + \frac{119}{8192}u^{44} + \cdots + 933u + 46 \\ 0.505615u^{45} + 14.1682u^{44} + \cdots + 82866u + 4141 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -0.274048u^{45} - 7.68079u^{44} + \cdots - 42145.5u - 2100 \\ 0.982910u^{45} + 27.7881u^{44} + \cdots + 203839u + 10297 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -2.30249u^{45} - 65.0942u^{44} + \cdots - 648664.u - 33111 \\ 1.45679u^{45} + 41.2253u^{44} + \cdots + 186450u + 9592 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.494507u^{45} - 13.8463u^{44} + \cdots - 81908u - 4096 \\ \frac{45}{4096}u^{45} + \frac{1259}{4096}u^{44} + \cdots + 25u - 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -2.72314u^{45} - 76.9080u^{44} + \cdots - 541748.u - 26895 \\ 0.812256u^{45} + 23.5637u^{44} + \cdots + 155986u + 7758 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -5.37744u^{45} - 152.656u^{44} + \cdots - 1.53361 \times 10^6 u - 79260.5 \\ 1.09839u^{45} + 31.0549u^{44} + \cdots + 140452.u + 7392 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{5013}{1024}u^{45} - \frac{144727}{1024}u^{44} + \cdots - 1843566u - 96850$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{46}+23u^{45}+\cdots+160u+64$
c_2, c_6	$u^{46}-9u^{45}+\cdots-80u+8$
c_3	$u^{46}+9u^{45}+\cdots+48000u+8768$
c_4, c_5, c_9 c_{11}	$u^{46}+22u^{44}+\cdots+2u+1$
c_7, c_{10}	$u^{46}-3u^{45}+\cdots+15u+1$
c_8, c_{12}	$u^{46}-29u^{45}+\cdots-172032u+8192$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{46} + 3y^{45} + \cdots + 34304y + 4096$
c_2, c_6	$y^{46} + 23y^{45} + \cdots + 160y + 64$
c_3	$y^{46} - 17y^{45} + \cdots + 657339392y + 76877824$
c_4, c_5, c_9 c_{11}	$y^{46} + 44y^{45} + \cdots + 2y + 1$
c_7, c_{10}	$y^{46} - 21y^{45} + \cdots - 131y + 1$
c_8, c_{12}	$y^{46} + 23y^{45} + \cdots - 301989888y + 67108864$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.799771+0.573925I$ $a=\ \ 0.364393+0.335556I$ $b=-0.066790-0.489318I$	$0.23982-5.32921I$	0
$u=-0.799771-0.573925I$ $a=\ \ 0.364393-0.335556I$ $b=-0.066790+0.489318I$	$0.23982+5.32921I$	0
$u=\ \ 0.893801+0.251608I$ $a=\ \ 0.044626+1.229910I$ $b=\ \ 0.58367-1.51957I$	$1.15969+2.64455I$	0
$u=\ \ 0.893801-0.251608I$ $a=\ \ 0.044626-1.229910I$ $b=\ \ 0.58367+1.51957I$	$1.15969-2.64455I$	0
$u=-0.512458+0.963987I$ $a=-0.430313+0.180490I$ $b=-0.0655666-0.0544458I$	$0.14368-3.22065I$	0
$u=-0.512458-0.963987I$ $a=-0.430313-0.180490I$ $b=-0.0655666+0.0544458I$	$0.14368+3.22065I$	0
$u=-0.388129+1.023260I$ $a=-0.426674+0.589584I$ $b=-0.183361+0.160958I$	$-1.19630-3.09642I$	0
$u=-0.388129-1.023260I$ $a=-0.426674-0.589584I$ $b=-0.183361-0.160958I$	$-1.19630+3.09642I$	0
$u=-0.324185+1.064380I$ $a=\ \ 0.399633-0.786327I$ $b=\ \ 0.197166-0.347962I$	$-4.51131+0.55103I$	0
$u=-0.324185-1.064380I$ $a=\ \ 0.399633+0.786327I$ $b=\ \ 0.197166+0.347962I$	$-4.51131-0.55103I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.636420+0.928507I$ $a=\ \ 0.487473+0.128530I$ $b=-0.118282+0.098125I$	$-0.796799+0.099834I$	0
$u=-0.636420-0.928507I$ $a=\ \ 0.487473-0.128530I$ $b=-0.118282-0.098125I$	$-0.796799-0.099834I$	0
$u=-0.400449+1.071460I$ $a=\ \ 0.563394-0.645136I$ $b=\ \ 0.312197-0.165596I$	$-4.04848-7.39004I$	0
$u=-0.400449-1.071460I$ $a=\ \ 0.563394+0.645136I$ $b=\ \ 0.312197+0.165596I$	$-4.04848+7.39004I$	0
$u=-0.065239+0.801819I$ $a=\ \ 0.118295+0.879729I$ $b=\ \ 0.403205+0.174145I$	$-1.90599-1.35920I$	0
$u=-0.065239-0.801819I$ $a=\ \ 0.118295-0.879729I$ $b=\ \ 0.403205-0.174145I$	$-1.90599+1.35920I$	0
$u=-0.636988+0.468513I$ $a=-0.399061-0.335733I$ $b=-0.186385+0.345366I$	$1.55277-1.12061I$	0
$u=-0.636988-0.468513I$ $a=-0.399061+0.335733I$ $b=-0.186385-0.345366I$	$1.55277+1.12061I$	0
$u=-1.293830+0.240209I$ $a=-0.125234-0.391120I$ $b=\ \ 0.17398+1.95216I$	$-9.2090-11.8951I$	0
$u=-1.293830-0.240209I$ $a=-0.125234+0.391120I$ $b=\ \ 0.17398-1.95216I$	$-9.2090+11.8951I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.343470+0.254073I$ $a=\ \ 0.121901+0.415510I$ $b=-0.26873-2.00701I$	$-6.15188-6.52811I$	0
$u=-1.343470-0.254073I$ $a=\ \ 0.121901-0.415510I$ $b=-0.26873+2.00701I$	$-6.15188+6.52811I$	0
$u=-1.374360+0.172869I$ $a=-0.081685-0.416558I$ $b=\ \ 0.18781+2.15232I$	$-11.06560-2.43248I$	0
$u=-1.374360-0.172869I$ $a=-0.081685+0.416558I$ $b=\ \ 0.18781-2.15232I$	$-11.06560+2.43248I$	0
$u=-0.597343+0.091283I$ $a=\ \ 0.532629+0.097217I$ $b=\ \ 0.581340-0.128594I$	$-1.30110+3.67557I$	0
$u=-0.597343-0.091283I$ $a=\ \ 0.532629-0.097217I$ $b=\ \ 0.581340+0.128594I$	$-1.30110-3.67557I$	0
$u=-0.474804+0.228895I$ $a=-0.606283-0.281711I$ $b=-0.394151+0.170715I$	$1.036500-0.329167I$	$9.79847+0.I$
$u=-0.474804-0.228895I$ $a=-0.606283+0.281711I$ $b=-0.394151-0.170715I$	$1.036500+0.329167I$	$9.79847+0.I$
$u=-0.50438+1.51379I$ $a=\ \ 0.54133+1.59621I$ $b=-0.81797+2.47099I$	$-14.8126-18.1675I$	0
$u=-0.50438-1.51379I$ $a=\ \ 0.54133-1.59621I$ $b=-0.81797-2.47099I$	$-14.8126+18.1675I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.50748+1.52626I$ $a=-0.53256-1.55965I$ $b=\ \ 0.81772-2.47947I$	$-11.8567-12.9387I$	0
$u=-0.50748-1.52626I$ $a=-0.53256+1.55965I$ $b=\ \ 0.81772+2.47947I$	$-11.8567+12.9387I$	0
$u=-0.52920+1.52540I$ $a=\ \ 0.58432+1.52852I$ $b=-0.83326+2.47604I$	$-16.5662-9.0443I$	0
$u=-0.52920-1.52540I$ $a=\ \ 0.58432-1.52852I$ $b=-0.83326-2.47604I$	$-16.5662+9.0443I$	0
$u=-0.49940+1.60831I$ $a=-0.43900-1.41526I$ $b=\ \ 0.80667-2.59864I$	$-7.89455-10.71430I$	0
$u=-0.49940-1.60831I$ $a=-0.43900+1.41526I$ $b=\ \ 0.80667+2.59864I$	$-7.89455+10.71430I$	0
$u=-0.66884+1.57562I$ $a=-0.632758-1.225720I$ $b=\ \ 1.10252-2.37452I$	$-15.5284-5.1709I$	0
$u=-0.66884-1.57562I$ $a=-0.632758+1.225720I$ $b=\ \ 1.10252+2.37452I$	$-15.5284+5.1709I$	0
$u=-0.79157+1.55497I$ $a=-0.635987-1.056940I$ $b=\ \ 1.37706-2.08974I$	$-12.99410+4.22647I$	0
$u=-0.79157-1.55497I$ $a=-0.635987+1.056940I$ $b=\ \ 1.37706+2.08974I$	$-12.99410-4.22647I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.53627+1.66484I$ $a=\ \ 0.439767+1.323980I$ $b=-0.90517+2.71062I$	$-7.40589-5.18365I$	0
$u=-0.53627-1.66484I$ $a=\ \ 0.439767-1.323980I$ $b=-0.90517-2.71062I$	$-7.40589+5.18365I$	0
$u=-1.75426+0.12015I$ $a=\ \ 0.035438+0.550581I$ $b=-0.30850-2.94126I$	$-1.59220-3.11488I$	0
$u=-1.75426-0.12015I$ $a=\ \ 0.035438-0.550581I$ $b=-0.30850+2.94126I$	$-1.59220+3.11488I$	0
$u=-0.75494+1.61988I$ $a=\ \ 0.576352+1.115620I$ $b=-1.39518+2.33963I$	$-10.17990-1.41035I$	0
$u=-0.75494-1.61988I$ $a=\ \ 0.576352-1.115620I$ $b=-1.39518-2.33963I$	$-10.17990+1.41035I$	0

II. $\boldsymbol{I_2^u = \langle -5.15\times 10^{18}a^{19}u^2 - 9.62\times 10^{18}a^{18}u^2 + \cdots - 5.70\times 10^{21}a - 2.02\times 10^{21},\ -2a^{19}u^2 - 5a^{18}u^2 + \cdots + 389a + 155,\ u^3 - u^2 + 2u - 1\rangle}$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} a \\ 0.00624366a^{19}u^2 + 0.0116573a^{18}u^2 + \cdots + 6.91278a + 2.44921 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 0.00624366a^{19}u^2 + 0.0116573a^{18}u^2 + \cdots + 7.91278a + 2.44921 \\ 0.00589498a^{19}u^2 + 0.00970531a^{18}u^2 + \cdots + 4.98347a + 1.02435 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.0222268a^{19}u^2 + 0.0385989a^{18}u^2 + \cdots - 1.52939a + 3.00132 \\ \frac{1}{5}a^2u^2 + \frac{2}{5}u^2 + \cdots + \frac{4}{5}a^2 + \frac{8}{5} \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} 0.0255730a^{19}u^2 - 0.0386005a^{18}u^2 + \cdots - 4.61675a - 5.17283 \\ -0.280000a^4u^2 - 1.12000a^2u^2 + \cdots - 2.08000a^2 - 2.08000 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.00811715a^{19}u^2 - 0.0185732a^{18}u^2 + \cdots + 2.73016a + 0.0448430 \\ 0.00840339a^{19}u^2 - 0.0245270a^{18}u^2 + \cdots - 2.51095a - 3.00433 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.0300738a^{19}u^2 + 0.0495554a^{18}u^2 + \cdots - 1.67353a + 3.99775 \\ -0.00784700a^{19}u^2 + 0.0109564a^{18}u^2 + \cdots - 0.144142a + 2.59644 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.0116152a^{19}u^2 - 0.0203774a^{18}u^2 + \cdots - 6.28641a - 7.47013 \\ \frac{1}{5}a^3u^2 + \frac{2}{5}u^2a + \cdots - \frac{1}{5}a^3 - \frac{2}{5}a \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.00249033a^{19}u^2 + 0.0238687a^{18}u^2 + \cdots + 12.0177a + 7.16327 \\ -0.00531474a^{19}u^2 + 0.0136319a^{18}u^2 + \cdots - 0.592585a + 0.0240514 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{21229213881407898776}{8251621895975410 15625}a^{19}u^2 - \frac{99261565058430515616}{825162189597541015625}a^{18}u^2 + \cdots - \frac{4819014882020878281412}{825162189597541015625}a - \frac{1488680091676662930 7678}{825162189597541015625}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{10}+5u^9+13u^8+19u^7+17u^6+7u^5-2u^3+u^2+2u+1)^6$
c_2, c_6	$(u^{10}+u^9+3u^8+3u^7+5u^6+5u^5+4u^4+4u^3+3u^2+2u+1)^6$
c_3	$(u^{10}+2u^9-u^8-5u^7-3u^6+4u^5+12u^4+13u^3+5u^2+u+2)^6$
c_4, c_5, c_9 c_{11}	$u^{60}+u^{59}+\cdots-626u+3383$
c_7, c_{10}	$u^{60}-11u^{59}+\cdots-53768u+6593$
c_8, c_{12}	$(u^3+u^2+2u+1)^{20}$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{10}+y^9+13y^8+11y^7+45y^6+35y^5+12y^4+2y^3+9y^2-2y+1)^6$
c_2, c_6	$(y^{10}+5y^9+13y^8+19y^7+17y^6+7y^5-2y^3+y^2+2y+1)^6$
c_3	$(y^{10}-6y^9+\cdots+19y+4)^6$
c_4, c_5, c_9 c_{11}	$y^{60}+55y^{59}+\cdots-363644884y+11444689$
c_7, c_{10}	$y^{60}-17y^{59}+\cdots+11794588y+43467649$
c_8, c_{12}	$(y^3+3y^2+2y-1)^{20}$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.215080 + 1.307140I$ $a = -0.753681 - 0.475251I$ $b = -1.78844 - 0.37957I$	$-8.34008 - 5.45819I$	$-3.68536 + 3.16937I$
$u = 0.215080 + 1.307140I$ $a = -0.546194 - 0.474142I$ $b = 0.403352 - 0.051960I$	$-8.34008 + 11.11440I$	$-3.68536 - 9.12826I$
$u = 0.215080 + 1.307140I$ $a = 0.574901 + 0.335993I$ $b = 1.57210 + 0.28523I$	$-5.54533 - 0.65027I$	$-0.314721 - 0.184301I$
$u = 0.215080 + 1.307140I$ $a = -0.285753 + 1.351650I$ $b = -0.543510 + 1.072600I$	$-8.40699 + 4.05981I$	$-4.41153 - 8.42852I$
$u = 0.215080 + 1.307140I$ $a = 0.428457 + 0.424908I$ $b = -0.499901 + 0.057312I$	$-5.54533 + 6.30651I$	$-0.31472 - 5.77459I$
$u = 0.215080 + 1.307140I$ $a = 0.91047 - 1.17250I$ $b = 1.24405 - 1.35425I$	$-8.40699 + 1.59643I$	$-4.41153 + 2.46963I$
$u = 0.215080 + 1.307140I$ $a = 0.46161 - 1.63922I$ $b = -0.57315 - 1.54354I$	$-8.34008 - 5.45819I$	$-3.68536 + 3.16937I$
$u = 0.215080 + 1.307140I$ $a = -0.37848 + 1.70556I$ $b = 0.61872 + 1.65480I$	$-5.54533 - 0.65027I$	$-0.314721 - 0.184301I$
$u = 0.215080 + 1.307140I$ $a = 0.249866 + 0.028485I$ $b = -0.749845 - 0.180326I$	$-3.02174 + 5.13818I$	$1.35393 - 6.50078I$
$u = 0.215080 + 1.307140I$ $a = 0.12162 - 1.79476I$ $b = 0.097878 - 1.186300I$	$-12.8356 + 6.9740I$	$-8.49110 - 6.95545I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.215080 + 1.307140I$ $a = -0.065417 + 0.174229I$ $b = 0.948493 + 0.296744I$	$-3.02174 + 0.51807I$	$1.35393 + 0.54188I$
$u = 0.215080 + 1.307140I$ $a = 0.22681 - 1.88180I$ $b = 0.054342 - 1.297810I$	$-12.83560 - 1.31773I$	$-8.49110 + 0.99655I$
$u = 0.215080 + 1.307140I$ $a = -0.50665 + 1.84019I$ $b = -0.17308 + 1.65844I$	$-8.40699 + 1.59643I$	$-4.41153 + 2.46963I$
$u = 0.215080 + 1.307140I$ $a = -0.09218 + 1.91765I$ $b = 0.92173 + 2.04017I$	$-3.02174 + 0.51807I$	$1.35393 + 0.54188I$
$u = 0.215080 + 1.307140I$ $a = 0.83452 - 1.90639I$ $b = 0.57676 - 2.18544I$	$-8.40699 + 4.05981I$	$-4.41153 - 8.42852I$
$u = 0.215080 + 1.307140I$ $a = 0.08612 - 2.09921I$ $b = -0.91359 - 2.30802I$	$-3.02174 + 5.13818I$	$1.35393 - 6.50078I$
$u = 0.215080 + 1.307140I$ $a = -1.44111 + 1.58193I$ $b = -1.61358 + 2.16592I$	$-12.83560 - 1.31773I$	$-8.49110 + 0.99655I$
$u = 0.215080 + 1.307140I$ $a = -1.37238 + 1.80234I$ $b = -1.39612 + 2.41080I$	$-12.8356 + 6.9740I$	$-8.49110 - 6.95545I$
$u = 0.215080 + 1.307140I$ $a = 0.23996 - 2.36391I$ $b = -0.68840 - 2.73151I$	$-5.54533 + 6.30651I$	$-0.31472 - 5.77459I$
$u = 0.215080 + 1.307140I$ $a = -0.23228 + 2.46167I$ $b = 0.71727 + 2.88385I$	$-8.34008 + 11.11440I$	$-3.68536 - 9.12826I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.215080 - 1.307140I$ $a = -0.753681 + 0.475251I$ $b = -1.78844 + 0.37957I$	$-8.34008 + 5.45819I$	$-3.68536 - 3.16937I$
$u = 0.215080 - 1.307140I$ $a = -0.546194 + 0.474142I$ $b = 0.403352 + 0.051960I$	$-8.34008 - 11.11440I$	$-3.68536 + 9.12826I$
$u = 0.215080 - 1.307140I$ $a = 0.574901 - 0.335993I$ $b = 1.57210 - 0.28523I$	$-5.54533 + 0.65027I$	$-0.314721 + 0.184301I$
$u = 0.215080 - 1.307140I$ $a = -0.285753 - 1.351650I$ $b = -0.543510 - 1.072600I$	$-8.40699 - 4.05981I$	$-4.41153 + 8.42852I$
$u = 0.215080 - 1.307140I$ $a = 0.428457 - 0.424908I$ $b = -0.499901 - 0.057312I$	$-5.54533 - 6.30651I$	$-0.31472 + 5.77459I$
$u = 0.215080 - 1.307140I$ $a = 0.91047 + 1.17250I$ $b = 1.24405 + 1.35425I$	$-8.40699 - 1.59643I$	$-4.41153 - 2.46963I$
$u = 0.215080 - 1.307140I$ $a = 0.46161 + 1.63922I$ $b = -0.57315 + 1.54354I$	$-8.34008 + 5.45819I$	$-3.68536 - 3.16937I$
$u = 0.215080 - 1.307140I$ $a = -0.37848 - 1.70556I$ $b = 0.61872 - 1.65480I$	$-5.54533 + 0.65027I$	$-0.314721 + 0.184301I$
$u = 0.215080 - 1.307140I$ $a = 0.249866 - 0.028485I$ $b = -0.749845 + 0.180326I$	$-3.02174 - 5.13818I$	$1.35393 + 6.50078I$
$u = 0.215080 - 1.307140I$ $a = 0.12162 + 1.79476I$ $b = 0.097878 + 1.186300I$	$-12.8356 - 6.9740I$	$-8.49110 + 6.95545I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.215080 - 1.307140I$ $a = -0.065417 - 0.174229I$ $b = 0.948493 - 0.296744I$	$-3.02174 - 0.51807I$	$1.35393 - 0.54188I$
$u = 0.215080 - 1.307140I$ $a = 0.22681 + 1.88180I$ $b = 0.054342 + 1.297810I$	$-12.83560 + 1.31773I$	$-8.49110 - 0.99655I$
$u = 0.215080 - 1.307140I$ $a = -0.50665 - 1.84019I$ $b = -0.17308 - 1.65844I$	$-8.40699 - 1.59643I$	$-4.41153 - 2.46963I$
$u = 0.215080 - 1.307140I$ $a = -0.09218 - 1.91765I$ $b = 0.92173 - 2.04017I$	$-3.02174 - 0.51807I$	$1.35393 - 0.54188I$
$u = 0.215080 - 1.307140I$ $a = 0.83452 + 1.90639I$ $b = 0.57676 + 2.18544I$	$-8.40699 - 4.05981I$	$-4.41153 + 8.42852I$
$u = 0.215080 - 1.307140I$ $a = 0.08612 + 2.09921I$ $b = -0.91359 + 2.30802I$	$-3.02174 - 5.13818I$	$1.35393 + 6.50078I$
$u = 0.215080 - 1.307140I$ $a = -1.44111 - 1.58193I$ $b = -1.61358 - 2.16592I$	$-12.83560 + 1.31773I$	$-8.49110 - 0.99655I$
$u = 0.215080 - 1.307140I$ $a = -1.37238 - 1.80234I$ $b = -1.39612 - 2.41080I$	$-12.8356 - 6.9740I$	$-8.49110 + 6.95545I$
$u = 0.215080 - 1.307140I$ $a = 0.23996 + 2.36391I$ $b = -0.68840 + 2.73151I$	$-5.54533 - 6.30651I$	$-0.31472 + 5.77459I$
$u = 0.215080 - 1.307140I$ $a = -0.23228 - 2.46167I$ $b = 0.71727 - 2.88385I$	$-8.34008 - 11.11440I$	$-3.68536 + 9.12826I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.569840$ $a = -0.691753 + 0.900274I$ $b = -0.198932 - 1.368010I$	$-1.40774 + 3.47839I$	$6.21454 - 2.79515I$
$u = \ 0.569840$ $a = -0.691753 - 0.900274I$ $b = -0.198932 + 1.368010I$	$-1.40774 - 3.47839I$	$6.21454 + 2.79515I$
$u = \ 0.569840$ $a = \ 0.833453 + 0.905620I$ $b = \ 0.22342 - 1.43186I$	$-4.20250 - 8.28632I$	$2.84391 + 6.14881I$
$u = \ 0.569840$ $a = \ 0.833453 - 0.905620I$ $b = \ 0.22342 + 1.43186I$	$-4.20250 + 8.28632I$	$2.84391 - 6.14881I$
$u = \ 0.569840$ $a = \ 0.869132 + 0.956638I$ $b = -0.535562 + 1.131840I$	$-8.69800 + 4.14585I$	$-1.96183 - 3.97600I$
$u = \ 0.569840$ $a = \ 0.869132 - 0.956638I$ $b = -0.535562 - 1.131840I$	$-8.69800 - 4.14585I$	$-1.96183 + 3.97600I$
$u = \ 0.569840$ $a = -0.254094 + 1.301160I$ $b = \ 0.288722 + 0.604570I$	$-4.26940 + 1.23169I$	$2.11774 - 5.44908I$
$u = \ 0.569840$ $a = -0.254094 - 1.301160I$ $b = \ 0.288722 - 0.604570I$	$-4.26940 - 1.23169I$	$2.11774 + 5.44908I$
$u = \ 0.569840$ $a = -0.363696 + 1.279380I$ $b = -0.262040 - 1.092640I$	$1.11584 + 2.31006I$	$7.88320 - 3.52133I$
$u = \ 0.569840$ $a = -0.363696 - 1.279380I$ $b = -0.262040 + 1.092640I$	$1.11584 - 2.31006I$	$7.88320 + 3.52133I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.569840$ $a = -0.389163 + 0.475675I$ $b = \ 0.153653 + 1.172260I$	$-4.26940 - 1.23169I$	$2.11774 + 5.44908I$
$u = \ 0.569840$ $a = -0.389163 - 0.475675I$ $b = \ 0.153653 - 1.172260I$	$-4.26940 + 1.23169I$	$2.11774 - 5.44908I$
$u = \ 0.569840$ $a = \ 0.795483 + 1.164250I$ $b = -0.609211 + 0.989056I$	$-8.69800 - 4.14585I$	$-1.96183 + 3.97600I$
$u = \ 0.569840$ $a = \ 0.795483 - 1.164250I$ $b = -0.609211 - 0.989056I$	$-8.69800 + 4.14585I$	$-1.96183 - 3.97600I$
$u = \ 0.569840$ $a = \ 0.24323 + 1.53155I$ $b = \ 0.344886 - 0.840470I$	$1.11584 + 2.31006I$	$7.88320 - 3.52133I$
$u = \ 0.569840$ $a = \ 0.24323 - 1.53155I$ $b = \ 0.344886 + 0.840470I$	$1.11584 - 2.31006I$	$7.88320 + 3.52133I$
$u = \ 0.569840$ $a = \ 0.10774 + 1.78772I$ $b = \ 0.600562 - 0.480557I$	$-1.40774 + 3.47839I$	$6.21454 - 2.79515I$
$u = \ 0.569840$ $a = \ 0.10774 - 1.78772I$ $b = \ 0.600562 + 0.480557I$	$-1.40774 - 3.47839I$	$6.21454 + 2.79515I$
$u = \ 0.569840$ $a = -0.11054 + 1.86439I$ $b = -0.720573 - 0.473098I$	$-4.20250 - 8.28632I$	$2.84391 + 6.14881I$
$u = \ 0.569840$ $a = -0.11054 - 1.86439I$ $b = -0.720573 + 0.473098I$	$-4.20250 + 8.28632I$	$2.84391 - 6.14881I$

III. $I_3^u =$
$\langle 4u^{29}+u^{28}+\cdots+b+33,\ -29u^{29}+70u^{28}+\cdots+2a-55,\ u^{30}-2u^{29}+\cdots+u+2\rangle$

(i) Arc colorings

$$a_8 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}\frac{29}{2}u^{29} - 35u^{28} + \cdots + 58u + \frac{55}{2}\\ -4u^{29} - u^{28} + \cdots + 19u - 33\end{pmatrix}$$
$$a_9 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}\frac{21}{2}u^{29} - 25u^{28} + \cdots + 54u + \frac{13}{2}\\ -6u^{29} + 12u^{28} + \cdots + 13u - 29\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-\frac{3}{2}u^{29} + 2u^{28} + \cdots - 12u - \frac{3}{2}\\ -u^{29} + 2u^{28} + \cdots - 2u + 1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}\frac{1}{2}u^{29} + 3u^{28} + \cdots + 17u + \frac{21}{2}\\ 2u^{29} - 2u^{28} + \cdots + 8u + 3\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-\frac{3}{2}u^{29} + 10u^{28} + \cdots - 4u + \frac{53}{2}\\ 4u^{29} - 2u^{28} + \cdots - 3u + 37\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-\frac{3}{2}u^{29} + 3u^{28} + \cdots - 10u + \frac{1}{2}\\ -u^{29} + 3u^{28} + \cdots + 12u^2 + 3\end{pmatrix}$$
$$a_6 = \begin{pmatrix}15u^{29} - 31u^{28} + \cdots + 33u + 19\\ 8u^{29} - 28u^{28} + \cdots + 50u - 40\end{pmatrix}$$
$$a_2 = \begin{pmatrix}\frac{33}{2}u^{29} - 19u^{28} + \cdots + 54u + \frac{159}{2}\\ 24u^{29} - 57u^{28} + \cdots + 105u - 3\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -47u^{29} + 95u^{28} - 548u^{27} + 913u^{26} - 2523u^{25} + 3700u^{24} - 5843u^{23} + 8328u^{22} - 6732u^{21} + 11019u^{20} - 2264u^{19} + 5985u^{18} + 726u^{17} - 9012u^{16} - 9505u^{15} - 26913u^{14} - 30055u^{13} - 34426u^{12} - 40817u^{11} - 25858u^{10} - 31373u^9 - 10806u^8 - 14162u^7 - 2007u^6 - 3834u^5 - 328u^4 - 894u^3 - 340u^2 - 176u - 76$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{30} - 16u^{29} + \cdots - 8u + 1$
c_2	$u^{30} - 2u^{29} + \cdots - 2u + 1$
c_3	$u^{30} + 2u^{29} + \cdots + 9u + 2$
c_4, c_{11}	$u^{30} + 17u^{28} + \cdots - u + 1$
c_5, c_9	$u^{30} + 17u^{28} + \cdots + u + 1$
c_6	$u^{30} + 2u^{29} + \cdots + 2u + 1$
c_7, c_{10}	$u^{30} - 3u^{29} + \cdots - 10u + 1$
c_8	$u^{30} - 2u^{29} + \cdots + u + 2$
c_{12}	$u^{30} + 2u^{29} + \cdots - u + 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{30} + 4y^{29} + \cdots - 12y + 1$
c_2, c_6	$y^{30} + 16y^{29} + \cdots + 8y + 1$
c_3	$y^{30} - 8y^{29} + \cdots + 51y + 4$
c_4, c_5, c_9 c_{11}	$y^{30} + 34y^{29} + \cdots - 9y + 1$
c_7, c_{10}	$y^{30} - 7y^{29} + \cdots - 30y + 1$
c_8, c_{12}	$y^{30} + 20y^{29} + \cdots + 63y + 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.954358+0.210669I$ $a=-0.157797+1.396290I$ $b=-0.42289-1.97188I$	$0.90437-2.79385I$	$-11.1621+9.0861I$
$u=-0.954358-0.210669I$ $a=-0.157797-1.396290I$ $b=-0.42289+1.97188I$	$0.90437+2.79385I$	$-11.1621-9.0861I$
$u=-0.487760+0.913151I$ $a=\ 0.282967+0.414413I$ $b=-0.469527+0.371738I$	$-0.262375-0.129830I$	$7.66829+1.39620I$
$u=-0.487760-0.913151I$ $a=\ 0.282967-0.414413I$ $b=-0.469527-0.371738I$	$-0.262375+0.129830I$	$7.66829-1.39620I$
$u=-0.452089+0.844145I$ $a=-0.552166-0.021065I$ $b=\ 0.009729-0.587148I$	$-0.00756-3.73651I$	$0.40463+10.05332I$
$u=-0.452089-0.844145I$ $a=-0.552166+0.021065I$ $b=\ 0.009729+0.587148I$	$-0.00756+3.73651I$	$0.40463-10.05332I$
$u=\ 0.395534+1.115610I$ $a=\ 1.05638-1.22612I$ $b=\ 0.257277-0.768700I$	$-11.11260-2.62022I$	$-4.33545+2.54697I$
$u=\ 0.395534-1.115610I$ $a=\ 1.05638+1.22612I$ $b=\ 0.257277+0.768700I$	$-11.11260+2.62022I$	$-4.33545-2.54697I$
$u=\ 0.282007+1.171250I$ $a=\ 0.99630-1.51825I$ $b=\ 0.609476-1.061230I$	$-11.60570+5.64781I$	$-4.91183-3.78174I$
$u=\ 0.282007-1.171250I$ $a=\ 0.99630+1.51825I$ $b=\ 0.609476+1.061230I$	$-11.60570-5.64781I$	$-4.91183+3.78174I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.194470 + 1.267770I$ $a = -0.69601 + 1.67138I$ $b = -0.75988 + 1.50055I$	$-8.33239 + 3.05072I$	$-3.41230 - 0.35327I$
$u = 0.194470 - 1.267770I$ $a = -0.69601 - 1.67138I$ $b = -0.75988 - 1.50055I$	$-8.33239 - 3.05072I$	$-3.41230 + 0.35327I$
$u = -0.220342 + 0.677642I$ $a = 1.72214 - 0.32654I$ $b = 0.274742 + 1.101150I$	$-5.82568 - 8.71515I$	$-4.10097 + 7.30655I$
$u = -0.220342 - 0.677642I$ $a = 1.72214 + 0.32654I$ $b = 0.274742 - 1.101150I$	$-5.82568 + 8.71515I$	$-4.10097 - 7.30655I$
$u = 0.374108 + 1.234240I$ $a = -0.84930 + 1.32789I$ $b = -0.232711 + 1.180040I$	$-8.13358 + 1.89857I$	$-60.10 - 0.703598I$
$u = 0.374108 - 1.234240I$ $a = -0.84930 - 1.32789I$ $b = -0.232711 - 1.180040I$	$-8.13358 - 1.89857I$	$-60.10 + 0.703598I$
$u = 0.113491 + 1.305880I$ $a = 0.48876 - 1.74372I$ $b = 0.90956 - 1.71662I$	$-10.39040 + 0.41896I$	$-6.15304 + 1.26264I$
$u = 0.113491 - 1.305880I$ $a = 0.48876 + 1.74372I$ $b = 0.90956 + 1.71662I$	$-10.39040 - 0.41896I$	$-6.15304 - 1.26264I$
$u = -0.265692 + 0.625254I$ $a = -1.61215 + 0.54381I$ $b = -0.279464 - 1.065660I$	$-2.88017 - 3.92346I$	$-1.21214 + 4.26144I$
$u = -0.265692 - 0.625254I$ $a = -1.61215 - 0.54381I$ $b = -0.279464 + 1.065660I$	$-2.88017 + 3.92346I$	$-1.21214 - 4.26144I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.05808 + 1.41627I$ $a = 0.30999 - 1.58553I$ $b = 0.92701 - 2.00489I$	$-9.22090 + 7.68788I$	$-4.49738 - 6.93831I$
$u = 0.05808 - 1.41627I$ $a = 0.30999 + 1.58553I$ $b = 0.92701 + 2.00489I$	$-9.22090 - 7.68788I$	$-4.49738 + 6.93831I$
$u = -0.160117 + 0.556209I$ $a = 2.02259 - 0.64113I$ $b = 0.298497 + 1.049780I$	$-6.93501 - 0.20087I$	$-6.34680 + 0.65586I$
$u = -0.160117 - 0.556209I$ $a = 2.02259 + 0.64113I$ $b = 0.298497 - 1.049780I$	$-6.93501 + 0.20087I$	$-6.34680 - 0.65586I$
$u = 0.17114 + 1.44043I$ $a = -0.44043 + 1.48846I$ $b = -0.63512 + 1.99041I$	$-7.14969 + 3.03258I$	$0. - 2.04340I$
$u = 0.17114 - 1.44043I$ $a = -0.44043 - 1.48846I$ $b = -0.63512 - 1.99041I$	$-7.14969 - 3.03258I$	$0. + 2.04340I$
$u = 0.446808 + 0.301559I$ $a = -1.211930 - 0.717774I$ $b = 0.006603 - 0.798556I$	$-5.10854 - 0.65478I$	$-7.03551 - 0.27211I$
$u = 0.446808 - 0.301559I$ $a = -1.211930 + 0.717774I$ $b = 0.006603 + 0.798556I$	$-5.10854 + 0.65478I$	$-7.03551 + 0.27211I$
$u = 1.50472 + 0.21618I$ $a = -0.109336 + 0.422908I$ $b = 0.50671 - 2.07597I$	$-1.12126 + 2.86817I$	0
$u = 1.50472 - 0.21618I$ $a = -0.109336 - 0.422908I$ $b = 0.50671 + 2.07597I$	$-1.12126 - 2.86817I$	0

IV. $I_4^u = \langle 67a^5u^2 + 102a^4u^2 + \cdots + 362a + 422,\ -2a^4u^2 - 2a^3u^2 + \cdots - 11a + 1,\ u^3 - u^2 + 2u - 1\rangle$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} a \\ -0.116522a^5u^2 - 0.177391a^4u^2 + \cdots - 0.629565a - 0.733913 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -0.116522a^5u^2 - 0.177391a^4u^2 + \cdots + 0.370435a - 0.733913 \\ -0.147826a^5u^2 - 0.0608696a^4u^2 + \cdots - 1.84348a - 1.40870 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.177391a^5u^2 - 0.00695652a^4u^2 + \cdots + 0.212174a + 0.0104348 \\ \frac{1}{5}a^2u^2 + \frac{2}{5}u^2 + \cdots + \frac{4}{5}a^2 + \frac{8}{5} \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -0.177391a^5u^2 + 0.00695652a^4u^2 + \cdots + 0.787826a + 0.389565 \\ -0.280000a^4u^2 - 1.12000a^2u^2 + \cdots - 2.08000a^2 - 2.08000 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.177391a^5u^2 - 0.00695652a^4u^2 + \cdots + 0.212174a - 0.389565 \\ -0.116522a^5u^2 + 0.102609a^4u^2 + \cdots - 0.629565a + 1.34609 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.293913a^5u^2 - 0.109565a^4u^2 + \cdots + 0.841739a + 1.06435 \\ 0.116522a^5u^2 - 0.102609a^4u^2 + \cdots + 0.629565a + 2.65391 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 0.0608696a^5u^2 - 0.0243478a^4u^2 + \cdots + 0.582609a - 0.963478 \\ -0.349565a^5u^2 - 0.0921739a^4u^2 + \cdots - 1.88870a + 0.0382609 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^3+2u^2+u-1)^6$
c_2, c_6	$(u^3+u-1)^6$
c_3	$(u-1)^{18}$
c_4, c_5, c_9 c_{11}	$u^{18}+10u^{16}+\cdots-106u+23$
c_7, c_{10}	$u^{18}-4u^{17}+\cdots-292u+89$
c_8, c_{12}	$(u^3+u^2+2u+1)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^3-2y^2+5y-1)^6$
c_2, c_6	$(y^3+2y^2+y-1)^6$
c_3	$(y-1)^{18}$
c_4, c_5, c_9 c_{11}	$y^{18}+20y^{17}+\cdots+356y+529$
c_7, c_{10}	$y^{18}-12y^{17}+\cdots-77788y+7921$
c_8, c_{12}	$(y^3+3y^2+2y-1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.215080 + 1.307140I$ $a = -0.784997 - 0.039230I$ $b = -1.69200 + 0.07253I$	$-9.60386 + 2.82812I$	$-5.50976 - 2.97945I$
$u = \ 0.215080 + 1.307140I$ $a = -0.330614 - 0.633892I$ $b = \ 0.492761 - 0.237412I$	$-9.60386 + 2.82812I$	$-5.50976 - 2.97945I$
$u = \ 0.215080 + 1.307140I$ $a = -0.22941 + 1.78152I$ $b = -0.145783 + 1.273280I$	$-9.60386 + 2.82812I$	$-5.50976 - 2.97945I$
$u = \ 0.215080 + 1.307140I$ $a = \ 0.47175 - 1.81160I$ $b = -0.43525 - 1.69984I$	$-9.60386 + 2.82812I$	$-5.50976 - 2.97945I$
$u = \ 0.215080 + 1.307140I$ $a = \ 1.28006 - 1.65694I$ $b = \ 1.36368 - 2.16518I$	$-9.60386 + 2.82812I$	$-5.50976 - 2.97945I$
$u = \ 0.215080 + 1.307140I$ $a = -0.40679 + 2.36014I$ $b = \ 0.41659 + 2.75662I$	$-9.60386 + 2.82812I$	$-5.50976 - 2.97945I$
$u = \ 0.215080 - 1.307140I$ $a = -0.784997 + 0.039230I$ $b = -1.69200 - 0.07253I$	$-9.60386 - 2.82812I$	$-5.50976 + 2.97945I$
$u = \ 0.215080 - 1.307140I$ $a = -0.330614 + 0.633892I$ $b = \ 0.492761 + 0.237412I$	$-9.60386 - 2.82812I$	$-5.50976 + 2.97945I$
$u = \ 0.215080 - 1.307140I$ $a = -0.22941 - 1.78152I$ $b = -0.145783 - 1.273280I$	$-9.60386 - 2.82812I$	$-5.50976 + 2.97945I$
$u = \ 0.215080 - 1.307140I$ $a = \ 0.47175 + 1.81160I$ $b = -0.43525 + 1.69984I$	$-9.60386 - 2.82812I$	$-5.50976 + 2.97945I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.215080 - 1.307140I$ $a = 1.28006 + 1.65694I$ $b = 1.36368 + 2.16518I$	$-9.60386 - 2.82812I$	$-5.50976 + 2.97945I$
$u = 0.215080 - 1.307140I$ $a = -0.40679 - 2.36014I$ $b = 0.41659 - 2.75662I$	$-9.60386 - 2.82812I$	$-5.50976 + 2.97945I$
$u = 0.569840$ $a = 0.693291 + 0.635785I$ $b = 0.094590 - 1.402580I$	-5.46628	1.01950
$u = 0.569840$ $a = 0.693291 - 0.635785I$ $b = 0.094590 + 1.402580I$	-5.46628	1.01950
$u = 0.569840$ $a = -0.709483 + 1.021010I$ $b = 0.487919 + 1.021010I$	-5.46628	1.01950
$u = 0.569840$ $a = -0.709483 - 1.021010I$ $b = 0.487919 - 1.021010I$	-5.46628	1.01950
$u = 0.569840$ $a = 0.01619 + 1.77975I$ $b = -0.582509 - 0.258612I$	-5.46628	1.01950
$u = 0.569840$ $a = 0.01619 - 1.77975I$ $b = -0.582509 + 0.258612I$	-5.46628	1.01950

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^3+2u^2+u-1)^6$ $\cdot(u^{10}+5u^9+13u^8+19u^7+17u^6+7u^5-2u^3+u^2+2u+1)^6$ $\cdot(u^{30}-16u^{29}+\cdots-8u+1)(u^{46}+23u^{45}+\cdots+160u+64)$
c_2	$(u^3+u-1)^6$ $\cdot(u^{10}+u^9+3u^8+3u^7+5u^6+5u^5+4u^4+4u^3+3u^2+2u+1)^6$ $\cdot(u^{30}-2u^{29}+\cdots-2u+1)(u^{46}-9u^{45}+\cdots-80u+8)$
c_3	$(u-1)^{18}$ $\cdot(u^{10}+2u^9-u^8-5u^7-3u^6+4u^5+12u^4+13u^3+5u^2+u+2)^6$ $\cdot(u^{30}+2u^{29}+\cdots+9u+2)(u^{46}+9u^{45}+\cdots+48000u+8768)$
c_4, c_{11}	$(u^{18}+10u^{16}+\cdots-106u+23)(u^{30}+17u^{28}+\cdots-u+1)$ $\cdot(u^{46}+22u^{44}+\cdots+2u+1)(u^{60}+u^{59}+\cdots-626u+3383)$
c_5, c_9	$(u^{18}+10u^{16}+\cdots-106u+23)(u^{30}+17u^{28}+\cdots+u+1)$ $\cdot(u^{46}+22u^{44}+\cdots+2u+1)(u^{60}+u^{59}+\cdots-626u+3383)$
c_6	$(u^3+u-1)^6$ $\cdot(u^{10}+u^9+3u^8+3u^7+5u^6+5u^5+4u^4+4u^3+3u^2+2u+1)^6$ $\cdot(u^{30}+2u^{29}+\cdots+2u+1)(u^{46}-9u^{45}+\cdots-80u+8)$
c_7, c_{10}	$(u^{18}-4u^{17}+\cdots-292u+89)(u^{30}-3u^{29}+\cdots-10u+1)$ $\cdot(u^{46}-3u^{45}+\cdots+15u+1)(u^{60}-11u^{59}+\cdots-53768u+6593)$
c_8	$((u^3+u^2+2u+1)^{26})(u^{30}-2u^{29}+\cdots+u+2)$ $\cdot(u^{46}-29u^{45}+\cdots-172032u+8192)$
c_{12}	$((u^3+u^2+2u+1)^{26})(u^{30}+2u^{29}+\cdots-u+2)$ $\cdot(u^{46}-29u^{45}+\cdots-172032u+8192)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^3-2y^2+5y-1)^6$ $\cdot(y^{10}+y^9+13y^8+11y^7+45y^6+35y^5+12y^4+2y^3+9y^2-2y+1)^6$ $\cdot(y^{30}+4y^{29}+\cdots-12y+1)(y^{46}+3y^{45}+\cdots+34304y+4096)$
c_2, c_6	$(y^3+2y^2+y-1)^6$ $\cdot(y^{10}+5y^9+13y^8+19y^7+17y^6+7y^5-2y^3+y^2+2y+1)^6$ $\cdot(y^{30}+16y^{29}+\cdots+8y+1)(y^{46}+23y^{45}+\cdots+160y+64)$
c_3	$((y-1)^{18})(y^{10}-6y^9+\cdots+19y+4)^6(y^{30}-8y^{29}+\cdots+51y+4)$ $\cdot(y^{46}-17y^{45}+\cdots+657339392y+76877824)$
c_4, c_5, c_9 c_{11}	$(y^{18}+20y^{17}+\cdots+356y+529)(y^{30}+34y^{29}+\cdots-9y+1)$ $\cdot(y^{46}+44y^{45}+\cdots+2y+1)$ $\cdot(y^{60}+55y^{59}+\cdots-363644884y+11444689)$
c_7, c_{10}	$(y^{18}-12y^{17}+\cdots-77788y+7921)(y^{30}-7y^{29}+\cdots-30y+1)$ $\cdot(y^{46}-21y^{45}+\cdots-131y+1)$ $\cdot(y^{60}-17y^{59}+\cdots+11794588y+43467649)$
c_8, c_{12}	$((y^3+3y^2+2y-1)^{26})(y^{30}+20y^{29}+\cdots+63y+4)$ $\cdot(y^{46}+23y^{45}+\cdots-301989888y+67108864)$