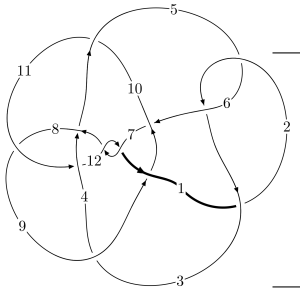
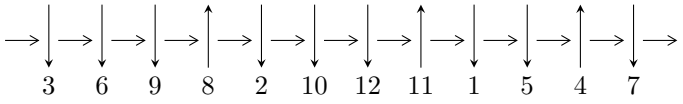
$12a_{0354}$ $(K12a_{0354})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -3.96195 \times 10^{18} u^{57} - 5.61291 \times 10^{19} u^{56} + \cdots + 1.17422 \times 10^{16} b + 4.90198 \times 10^{20}, \\
&\quad - 8.24820 \times 10^{18} u^{57} - 1.13864 \times 10^{20} u^{56} + \cdots + 1.17422 \times 10^{16} a + 8.05463 \times 10^{20}, \\
&\quad u^{58} + 14 u^{57} + \cdots - 928 u - 64 \rangle \\
I_2^u &= \langle -1.56047 \times 10^{15} a^5 u^{18} + 3.18174 \times 10^{13} a^4 u^{18} + \cdots + 3.31109 \times 10^{14} a - 1.08507 \times 10^{15}, \\
&\quad 6 u^{18} a^5 + 8 u^{18} a^4 + \cdots + 188 a - 69,\ u^{19} - 2 u^{18} + \cdots - 4 u + 1 \rangle \\
I_3^u &= \langle -292694585 u^{36} + 1804999042 u^{35} + \cdots + 8736867 b + 1338165752, \\
&\quad - 544656919 u^{36} + 3321883283 u^{35} + \cdots + 14561445 a + 2220591718,\ u^{37} - 7 u^{36} + \cdots - 27 u + 5 \rangle \\
I_4^u &= \langle a^5 + a^4 - 3 a^3 + 3 a^2 + 45 b - 27 a - 18,\ a^6 - 3 a^5 + 3 a^4 - 9 a^2 + 27,\ u + 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 215 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. $I_1^u = \langle -3.96 \times 10^{18} u^{57} - 5.61 \times 10^{19} u^{56} + \cdots + 1.17 \times 10^{16} b + 4.90 \times 10^{20},\ -8.25 \times 10^{18} u^{57} - 1.14 \times 10^{20} u^{56} + \cdots + 1.17 \times 10^{16} a + 8.05 \times 10^{20},\ u^{58} + 14 u^{57} + \cdots - 928 u - 64 \rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 702.443u^{57} + 9697.03u^{56} + \cdots - 921874.u - 68595.8 \\ 337.412u^{57} + 4780.13u^{56} + \cdots - 554592.u - 41746.8 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1136.18u^{57} - 15917.9u^{56} + \cdots + 1.72572 \times 10^6 u + 129786. \\ -380.595u^{57} - 5825.14u^{56} + \cdots + 985764.u + 75499.0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 365.031u^{57} + 4916.90u^{56} + \cdots - 367281.u - 26849.0 \\ 337.412u^{57} + 4780.13u^{56} + \cdots - 554592.u - 41746.8 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 458.764u^{57} + 6042.32u^{56} + \cdots - 378194.u - 27373.9 \\ 403.116u^{57} + 5707.30u^{56} + \cdots - 635530.u - 47706.2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 251.070u^{57} + 3348.63u^{56} + \cdots - 236664.u - 17303.7 \\ 38.8840u^{57} + 782.156u^{56} + \cdots - 231104.u - 17791.9 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 740.528u^{57} + 9337.11u^{56} + \cdots - 264188.u - 16959.8 \\ 1862.40u^{57} + 24267.6u^{56} + \cdots - 1.31852 \times 10^6 u - 94085.5 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 707.799u^{57} + 9247.31u^{56} + \cdots - 543363.u - 39191.2 \\ 469.499u^{57} + 6655.32u^{56} + \cdots - 808644.u - 61298.1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{6462402672161082471}{2935541202435748}u^{57} - \frac{42708315538598190931}{1467770601217874}u^{56} + \cdots + \frac{1380025211473468370317}{733885300608937}u + \frac{1003724396274183567 22}{733885300608937}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{58}+26u^{57}+\cdots+83456u+4096$
c_2, c_5	$u^{58}+14u^{57}+\cdots-928u-64$
c_3, c_{10}	$u^{58}+17u^{56}+\cdots+461u-77$
c_4, c_{11}	$u^{58}-u^{57}+\cdots+u+1$
c_6, c_9	$u^{58}-u^{57}+\cdots+17u-1$
c_7, c_{12}	$u^{58}+40u^{57}+\cdots-7340032u-262144$
c_8	$u^{58}+45u^{57}+\cdots+80u+8$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{58} + 18y^{57} + \cdots + 5636096y + 16777216$
c_2, c_5	$y^{58} - 26y^{57} + \cdots - 83456y + 4096$
c_3, c_{10}	$y^{58} + 34y^{57} + \cdots - 273813y + 5929$
c_4, c_{11}	$y^{58} - 5y^{57} + \cdots - 9y + 1$
c_6, c_9	$y^{58} + 11y^{57} + \cdots - 211y + 1$
c_7, c_{12}	$y^{58} + 38y^{57} + \cdots - 1030792151040y + 68719476736$
c_8	$y^{58} - 5y^{57} + \cdots + 1760y + 64$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.876279+0.463278I$ $a=-1.56801+0.33201I$ $b=-1.060230+0.569569I$	$2.91483-0.87856I$	0
$u=-0.876279-0.463278I$ $a=-1.56801-0.33201I$ $b=-1.060230-0.569569I$	$2.91483+0.87856I$	0
$u=\ \ 0.865412+0.530275I$ $a=-1.63027+0.75726I$ $b=-0.186310-1.351960I$	$-0.95828-2.13226I$	0
$u=\ \ 0.865412-0.530275I$ $a=-1.63027-0.75726I$ $b=-0.186310+1.351960I$	$-0.95828+2.13226I$	0
$u=\ \ 0.843862+0.501636I$ $a=\ \ 1.45119-1.42798I$ $b=\ \ 0.625040+1.262900I$	$3.05531+0.88558I$	0
$u=\ \ 0.843862-0.501636I$ $a=\ \ 1.45119+1.42798I$ $b=\ \ 0.625040-1.262900I$	$3.05531-0.88558I$	0
$u=-0.852561+0.486055I$ $a=\ \ 1.17675+1.60777I$ $b=\ \ 1.11394+0.93016I$	$2.98892+4.78290I$	0
$u=-0.852561-0.486055I$ $a=\ \ 1.17675-1.60777I$ $b=\ \ 1.11394-0.93016I$	$2.98892-4.78290I$	0
$u=\ \ 1.004710+0.183945I$ $a=-1.53637+0.82258I$ $b=-0.715308-0.228587I$	$-4.19172-0.28235I$	0
$u=\ \ 1.004710-0.183945I$ $a=-1.53637-0.82258I$ $b=-0.715308+0.228587I$	$-4.19172+0.28235I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.935675 + 0.479904I$ $a = 1.47112 + 0.13642I$ $b = -0.178971 + 1.077070I$	$2.81479 - 4.88334I$	0
$u = 0.935675 - 0.479904I$ $a = 1.47112 - 0.13642I$ $b = -0.178971 - 1.077070I$	$2.81479 + 4.88334I$	0
$u = -0.846642 + 0.421099I$ $a = -0.658051 - 1.168120I$ $b = -0.733140 - 0.764484I$	$-1.52095 + 1.93652I$	0
$u = -0.846642 - 0.421099I$ $a = -0.658051 + 1.168120I$ $b = -0.733140 + 0.764484I$	$-1.52095 - 1.93652I$	0
$u = -0.520255 + 0.931957I$ $a = -0.051126 - 0.179106I$ $b = 0.74032 + 1.58591I$	$10.6313 - 14.6307I$	0
$u = -0.520255 - 0.931957I$ $a = -0.051126 + 0.179106I$ $b = 0.74032 - 1.58591I$	$10.6313 + 14.6307I$	0
$u = -0.621310 + 0.874512I$ $a = -0.242172 + 0.219845I$ $b = -0.463059 - 1.181600I$	$9.91537 - 5.61324I$	0
$u = -0.621310 - 0.874512I$ $a = -0.242172 - 0.219845I$ $b = -0.463059 + 1.181600I$	$9.91537 + 5.61324I$	0
$u = -0.515406 + 0.977676I$ $a = -0.056097 + 0.195449I$ $b = 0.422539 - 1.243540I$	$10.49930 + 9.46799I$	0
$u = -0.515406 - 0.977676I$ $a = -0.056097 - 0.195449I$ $b = 0.422539 + 1.243540I$	$10.49930 - 9.46799I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.083270 + 0.260448I$ $a = 1.23645 + 0.70270I$ $b = 0.150954 + 0.884488I$	$2.72054 - 5.06764I$	0
$u = 1.083270 - 0.260448I$ $a = 1.23645 - 0.70270I$ $b = 0.150954 - 0.884488I$	$2.72054 + 5.06764I$	0
$u = -0.539639 + 0.975725I$ $a = 0.063073 + 0.217815I$ $b = -0.514156 - 1.268230I$	$4.44320 - 8.50447I$	0
$u = -0.539639 - 0.975725I$ $a = 0.063073 - 0.217815I$ $b = -0.514156 + 1.268230I$	$4.44320 + 8.50447I$	0
$u = -0.312416 + 1.100670I$ $a = -0.138681 - 0.270153I$ $b = -0.041517 + 1.155970I$	$7.63163 + 0.88952I$	0
$u = -0.312416 - 1.100670I$ $a = -0.138681 + 0.270153I$ $b = -0.041517 - 1.155970I$	$7.63163 - 0.88952I$	0
$u = -1.15086$ $a = 0.463126$ $b = 0.544886$	-1.95009	0
$u = -1.043040 + 0.491767I$ $a = 1.102130 + 0.553147I$ $b = 1.031740 - 0.105359I$	$-2.37385 + 1.31800I$	0
$u = -1.043040 - 0.491767I$ $a = 1.102130 - 0.553147I$ $b = 1.031740 + 0.105359I$	$-2.37385 - 1.31800I$	0
$u = -0.999163 + 0.587264I$ $a = -1.54058 - 0.76351I$ $b = -1.088130 + 0.255041I$	$-1.68351 + 5.60090I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.999163-0.587264I$ $a=-1.54058+0.76351I$ $b=-1.088130-0.255041I$	$-1.68351-5.60090I$	0
$u=\ \ 0.817878$ $a=-1.99134$ $b=-0.141479$	-2.85067	0
$u=-0.623337+1.006520I$ $a=\ \ 0.059647-0.268869I$ $b=-0.012045+1.023710I$	$4.71528+2.38651I$	0
$u=-0.623337-1.006520I$ $a=\ \ 0.059647+0.268869I$ $b=-0.012045-1.023710I$	$4.71528-2.38651I$	0
$u=-0.585968+0.548112I$ $a=\ \ 0.630401+0.491093I$ $b=\ \ 0.822789+0.428793I$	$-0.473220-0.946588I$	0
$u=-0.585968-0.548112I$ $a=\ \ 0.630401-0.491093I$ $b=\ \ 0.822789-0.428793I$	$-0.473220+0.946588I$	0
$u=\ \ 1.207810+0.265869I$ $a=\ \ 1.029380-0.161558I$ $b=\ \ 0.761719+0.488211I$	$-3.80302-6.16815I$	0
$u=\ \ 1.207810-0.265869I$ $a=\ \ 1.029380+0.161558I$ $b=\ \ 0.761719-0.488211I$	$-3.80302+6.16815I$	0
$u=-1.057620+0.712836I$ $a=\ \ 1.82206+0.33484I$ $b=\ \ 0.585417-1.135420I$	$8.5726+11.4964I$	0
$u=-1.057620-0.712836I$ $a=\ \ 1.82206-0.33484I$ $b=\ \ 0.585417+1.135420I$	$8.5726-11.4964I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.294710 + 0.041752I$ $a = -0.99269 - 1.28098I$ $b = -0.79302 - 1.28423I$	$3.71590 - 12.29490I$	0
$u = 1.294710 - 0.041752I$ $a = -0.99269 + 1.28098I$ $b = -0.79302 + 1.28423I$	$3.71590 + 12.29490I$	0
$u = -0.087008 + 0.675977I$ $a = 0.182243 - 0.501895I$ $b = -0.694819 + 0.071010I$	$0.17299 + 2.68830I$	$-6.00000 - 3.32279I$
$u = -0.087008 - 0.675977I$ $a = 0.182243 + 0.501895I$ $b = -0.694819 - 0.071010I$	$0.17299 - 2.68830I$	$-6.00000 + 3.32279I$
$u = -1.121810 + 0.698380I$ $a = -2.07726 - 0.21262I$ $b = -0.84659 + 1.65134I$	$8.7845 + 20.6080I$	0
$u = -1.121810 - 0.698380I$ $a = -2.07726 + 0.21262I$ $b = -0.84659 - 1.65134I$	$8.7845 - 20.6080I$	0
$u = -1.075910 + 0.773792I$ $a = -1.165870 - 0.157077I$ $b = -0.158853 + 0.925484I$	$3.31222 + 4.03148I$	0
$u = -1.075910 - 0.773792I$ $a = -1.165870 + 0.157077I$ $b = -0.158853 - 0.925484I$	$3.31222 - 4.03148I$	0
$u = -1.127170 + 0.720872I$ $a = 1.60110 + 0.25919I$ $b = 0.65567 - 1.33268I$	$2.6225 + 14.6751I$	0
$u = -1.127170 - 0.720872I$ $a = 1.60110 - 0.25919I$ $b = 0.65567 + 1.33268I$	$2.6225 - 14.6751I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.149590+0.743910I$ $a=\ \ 0.954799-0.533033I$ $b=-0.293251-1.059050I$	$8.57491-3.20558I$	0
$u=-1.149590-0.743910I$ $a=\ \ 0.954799+0.533033I$ $b=-0.293251+1.059050I$	$8.57491+3.20558I$	0
$u=-1.24299+0.78078I$ $a=-0.849782+0.098559I$ $b=-0.138776+1.140370I$	$4.87167+5.85154I$	0
$u=-1.24299-0.78078I$ $a=-0.849782-0.098559I$ $b=-0.138776-1.140370I$	$4.87167-5.85154I$	0
$u=\ \ 1.47860+0.08119I$ $a=\ \ 0.347368+0.572332I$ $b=\ \ 0.355019+0.875731I$	$-3.28236-5.74811I$	0
$u=\ \ 1.47860-0.08119I$ $a=\ \ 0.347368-0.572332I$ $b=\ \ 0.355019-0.875731I$	$-3.28236+5.74811I$	0
$u=-0.349464+0.143339I$ $a=\ \ 1.268350-0.510768I$ $b=\ \ 0.451323-0.441508I$	$-0.846218+0.678005I$	$-8.10349-5.25581I$
$u=-0.349464-0.143339I$ $a=\ \ 1.268350+0.510768I$ $b=\ \ 0.451323+0.441508I$	$-0.846218-0.678005I$	$-8.10349+5.25581I$

II. $\boldsymbol{I_2^u = \langle -1.56\times 10^{15}a^5u^{18} + 3.18\times 10^{13}a^4u^{18} + \cdots + 3.31\times 10^{14}a - 1.09\times 10^{15},\ 6u^{18}a^5 + 8u^{18}a^4 + \cdots + 188a - 69,\ u^{19} - 2u^{18} + \cdots - 4u + 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ 8.53027a^5u^{18} - 0.173929a^4u^{18} + \cdots - 1.81000a + 5.93153 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -7.22607a^5u^{18} - 2.99560a^4u^{18} + \cdots - 3.73093a + 8.39393 \\ 0.998845a^2u^{18} - 0.343520u^{18} + \cdots - 0.991205a^2 + 0.308341 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -8.53027a^5u^{18} + 0.173929a^4u^{18} + \cdots + 2.81000a - 5.93153 \\ 8.53027a^5u^{18} - 0.173929a^4u^{18} + \cdots - 1.81000a + 5.93153 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 8.27781a^5u^{18} - 1.49235a^4u^{18} + \cdots + 0.825771a - 1.14392 \\ -14.1439a^5u^{18} + 2.37228a^4u^{18} + \cdots - 1.29595a + 7.21589 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 6.94768a^5u^{18} + 0.452478a^4u^{18} + \cdots + 2.07529a + 2.53225 \\ -12.8138a^5u^{18} + 0.427453a^4u^{18} + \cdots - 1.54546a + 3.53972 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 59.2197a^5u^{18} + 26.7053a^4u^{18} + \cdots + 0.392941a - 4.15300 \\ -93.9995a^5u^{18} - 41.5321a^4u^{18} + \cdots + 1.12628a - 3.59985 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -21.3441a^5u^{18} - 10.6095a^4u^{18} + \cdots + 2.04327a + 1.68052 \\ 35.9712a^5u^{18} + 18.0658a^4u^{18} + \cdots + 1.54982a - 1.86103 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{2749082792001216}{182932936016351}u^{18}a^5 + \frac{16259650261624}{182932936016351}u^{18}a^4 + \cdots - \frac{1019524816793328}{182932936016351}a + \frac{297941330504151}{182932936016351}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{19}+8u^{18}+\cdots+4u+1)^6$
c_2, c_5	$(u^{19}-2u^{18}+\cdots-4u+1)^6$
c_3, c_{10}	$u^{114}-2u^{113}+\cdots-4054780664u+1331355377$
c_4, c_{11}	$u^{114}-4u^{113}+\cdots-2666478u+405443$
c_6, c_9	$u^{114}+3u^{113}+\cdots+3197956u+281947$
c_7, c_{12}	$(u^3-u^2+2u-1)^{38}$
c_8	$(u^{19}-9u^{18}+\cdots-u+2)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{19}+8y^{18}+\cdots-16y-1)^6$
c_2, c_5	$(y^{19}-8y^{18}+\cdots+4y-1)^6$
c_3, c_{10}	$y^{114}+64y^{113}+\cdots+6.82\times10^{19}y+1.77\times10^{18}$
c_4, c_{11}	$y^{114}-44y^{113}+\cdots-7420008525078y+164384026249$
c_6, c_9	$y^{114}+49y^{113}+\cdots+72527526349296y+79494110809$
c_7, c_{12}	$(y^3+3y^2+2y-1)^{38}$
c_8	$(y^{19}-3y^{18}+\cdots+37y-4)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.785473+0.623414I$ $a=-0.511848+1.282950I$ $b=-0.350637-1.049250I$	$7.35534+0.92615I$	$5.13397-1.59952I$
$u=-0.785473+0.623414I$ $a=-0.518209+0.033169I$ $b=\ \ 0.68395+1.43194I$	$3.21776-1.90197I$	$-1.39530+1.37993I$
$u=-0.785473+0.623414I$ $a=\ \ 1.44594-0.81966I$ $b=-0.71432-2.33279I$	$7.35534-4.73010I$	$5.13397+4.35937I$
$u=-0.785473+0.623414I$ $a=\ \ 1.96666+0.79464I$ $b=\ \ 0.083353-0.756518I$	$3.21776-1.90197I$	$-1.39530+1.37993I$
$u=-0.785473+0.623414I$ $a=-1.98860-0.81593I$ $b=-1.20770+1.02129I$	$7.35534+0.92615I$	$5.13397-1.59952I$
$u=-0.785473+0.623414I$ $a=-2.31273-1.57179I$ $b=\ \ 0.488890+0.790589I$	$7.35534-4.73010I$	$5.13397+4.35937I$
$u=-0.785473-0.623414I$ $a=-0.511848-1.282950I$ $b=-0.350637+1.049250I$	$7.35534-0.92615I$	$5.13397+1.59952I$
$u=-0.785473-0.623414I$ $a=-0.518209-0.033169I$ $b=\ \ 0.68395-1.43194I$	$3.21776+1.90197I$	$-1.39530-1.37993I$
$u=-0.785473-0.623414I$ $a=\ \ 1.44594+0.81966I$ $b=-0.71432+2.33279I$	$7.35534+4.73010I$	$5.13397-4.35937I$
$u=-0.785473-0.623414I$ $a=\ \ 1.96666-0.79464I$ $b=\ \ 0.083353+0.756518I$	$3.21776+1.90197I$	$-1.39530-1.37993I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.785473-0.623414I$ $a=-1.98860+0.81593I$ $b=-1.20770-1.02129I$	$7.35534-0.92615I$	$5.13397+1.59952I$
$u=-0.785473-0.623414I$ $a=-2.31273+1.57179I$ $b=0.488890-0.790589I$	$7.35534+4.73010I$	$5.13397-4.35937I$
$u=0.511993+0.911621I$ $a=-0.255017+0.352927I$ $b=0.89652-1.94808I$	$8.93377+5.15755I$	$6.90979-5.98553I$
$u=0.511993+0.911621I$ $a=-0.299289-0.269832I$ $b=0.72070+1.35949I$	$8.93377-0.49870I$	$6.90979-0.02664I$
$u=0.511993+0.911621I$ $a=0.218890-0.113013I$ $b=-0.60821+1.30701I$	$4.79618+2.32942I$	$0.38053-3.00608I$
$u=0.511993+0.911621I$ $a=-0.227565-0.090930I$ $b=0.171922-1.138140I$	$8.93377-0.49870I$	$6.90979-0.02664I$
$u=0.511993+0.911621I$ $a=-0.186498+0.108363I$ $b=-0.533182+1.103240I$	$8.93377+5.15755I$	$6.90979-5.98553I$
$u=0.511993+0.911621I$ $a=0.197663+0.069769I$ $b=0.067943-1.038820I$	$4.79618+2.32942I$	$0.38053-3.00608I$
$u=0.511993-0.911621I$ $a=-0.255017-0.352927I$ $b=0.89652+1.94808I$	$8.93377-5.15755I$	$6.90979+5.98553I$
$u=0.511993-0.911621I$ $a=-0.299289+0.269832I$ $b=0.72070-1.35949I$	$8.93377+0.49870I$	$6.90979+0.02664I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.511993 - 0.911621I$ $a = 0.218890 + 0.113013I$ $b = -0.60821 - 1.30701I$	$4.79618 - 2.32942I$	$0.38053 + 3.00608I$
$u = 0.511993 - 0.911621I$ $a = -0.227565 + 0.090930I$ $b = 0.171922 + 1.138140I$	$8.93377 + 0.49870I$	$6.90979 + 0.02664I$
$u = 0.511993 - 0.911621I$ $a = -0.186498 - 0.108363I$ $b = -0.533182 - 1.103240I$	$8.93377 - 5.15755I$	$6.90979 + 5.98553I$
$u = 0.511993 - 0.911621I$ $a = 0.197663 - 0.069769I$ $b = 0.067943 + 1.038820I$	$4.79618 - 2.32942I$	$0.38053 + 3.00608I$
$u = 0.835893 + 0.695746I$ $a = -0.126267 - 0.911046I$ $b = 0.88517 - 1.23416I$	$7.61932 - 5.49434I$	$5.09594 + 6.18824I$
$u = 0.835893 + 0.695746I$ $a = 1.237340 - 0.538780I$ $b = 0.166261 + 0.646039I$	$3.48174 - 2.66622I$	$-1.43332 + 3.20879I$
$u = 0.835893 + 0.695746I$ $a = -1.40501 + 0.63403I$ $b = -1.116560 - 0.839803I$	$7.61932 + 0.16190I$	$5.09594 + 0.22934I$
$u = 0.835893 + 0.695746I$ $a = 0.70613 + 1.46954I$ $b = -0.457930 - 0.892431I$	$7.61932 + 0.16190I$	$5.09594 + 0.22934I$
$u = 0.835893 + 0.695746I$ $a = 0.004965 - 0.216359I$ $b = -0.114268 + 0.888372I$	$3.48174 - 2.66622I$	$-1.43332 + 3.20879I$
$u = 0.835893 + 0.695746I$ $a = -2.06286 + 0.56296I$ $b = 0.568450 - 0.600680I$	$7.61932 - 5.49434I$	$5.09594 + 6.18824I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.835893 - 0.695746I$ $a = -0.126267 + 0.911046I$ $b = 0.88517 + 1.23416I$	$7.61932 + 5.49434I$	$5.09594 - 6.18824I$
$u = 0.835893 - 0.695746I$ $a = 1.237340 + 0.538780I$ $b = 0.166261 - 0.646039I$	$3.48174 + 2.66622I$	$-1.43332 - 3.20879I$
$u = 0.835893 - 0.695746I$ $a = -1.40501 - 0.63403I$ $b = -1.116560 + 0.839803I$	$7.61932 - 0.16190I$	$5.09594 - 0.22934I$
$u = 0.835893 - 0.695746I$ $a = 0.70613 - 1.46954I$ $b = -0.457930 + 0.892431I$	$7.61932 - 0.16190I$	$5.09594 - 0.22934I$
$u = 0.835893 - 0.695746I$ $a = 0.004965 + 0.216359I$ $b = -0.114268 - 0.888372I$	$3.48174 + 2.66622I$	$-1.43332 - 3.20879I$
$u = 0.835893 - 0.695746I$ $a = -2.06286 - 0.56296I$ $b = 0.568450 + 0.600680I$	$7.61932 + 5.49434I$	$5.09594 - 6.18824I$
$u = -0.902262 + 0.616698I$ $a = 0.045341 + 0.965489I$ $b = 1.06244 + 1.38651I$	$6.99198 + 3.94763I$	$3.41736 - 5.91144I$
$u = -0.902262 + 0.616698I$ $a = -0.031199 + 0.889282I$ $b = -0.007497 - 0.998655I$	$2.85440 + 6.77576I$	$-3.11191 - 8.89089I$
$u = -0.902262 + 0.616698I$ $a = -2.14735 - 0.80705I$ $b = -0.93486 + 1.41456I$	$2.85440 + 6.77576I$	$-3.11191 - 8.89089I$
$u = -0.902262 + 0.616698I$ $a = -0.19218 - 2.46617I$ $b = -0.466864 + 0.970117I$	$6.99198 + 9.60388I$	$3.41736 - 11.87034I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.902262+0.616698I$ $a=\ \ 2.64330+0.22094I$ $b=\ \ 1.15184-2.38340I$	$6.99198+9.60388I$	$3.41736-11.87034I$
$u=-0.902262+0.616698I$ $a=\ \ 2.56805+1.08857I$ $b=\ \ 0.443301-0.940087I$	$6.99198+3.94763I$	$3.41736-5.91144I$
$u=-0.902262-0.616698I$ $a=\ \ 0.045341-0.965489I$ $b=\ \ 1.06244-1.38651I$	$6.99198-3.94763I$	$3.41736+5.91144I$
$u=-0.902262-0.616698I$ $a=-0.031199-0.889282I$ $b=-0.007497+0.998655I$	$2.85440-6.77576I$	$-3.11191+8.89089I$
$u=-0.902262-0.616698I$ $a=-2.14735+0.80705I$ $b=-0.93486-1.41456I$	$2.85440-6.77576I$	$-3.11191+8.89089I$
$u=-0.902262-0.616698I$ $a=-0.19218+2.46617I$ $b=-0.466864-0.970117I$	$6.99198-9.60388I$	$3.41736+11.87034I$
$u=-0.902262-0.616698I$ $a=\ \ 2.64330-0.22094I$ $b=\ \ 1.15184+2.38340I$	$6.99198-9.60388I$	$3.41736+11.87034I$
$u=-0.902262-0.616698I$ $a=\ \ 2.56805-1.08857I$ $b=\ \ 0.443301+0.940087I$	$6.99198-3.94763I$	$3.41736+5.91144I$
$u=-1.114790+0.217503I$ $a=\ \ 1.027330+0.418259I$ $b=\ \ 0.549935+0.398240I$	$0.82629+2.06681I$	$-9.98843+4.07433I$
$u=-1.114790+0.217503I$ $a=-0.607679-1.202920I$ $b=-0.473762-0.587754I$	$-3.31130-0.76131I$	$-16.5177+7.0538I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.114790+0.217503I$ $a=\ \ 1.44360+0.08135I$ $b=\ \ 1.064160-0.834405I$	$-3.31130-0.76131I$	$-16.5177+7.0538I$
$u=-1.114790+0.217503I$ $a=\ \ 0.20497+1.68305I$ $b=\ \ 0.169569+0.707717I$	$0.82629-3.58943I$	$-9.9884+10.0332I$
$u=-1.114790+0.217503I$ $a=-0.89228+1.71023I$ $b=\ \ 0.16710+1.83738I$	$0.82629+2.06681I$	$-9.98843+4.07433I$
$u=-1.114790+0.217503I$ $a=-2.28329-1.20421I$ $b=-2.25911+0.36278I$	$0.82629-3.58943I$	$-9.9884+10.0332I$
$u=-1.114790-0.217503I$ $a=\ \ 1.027330-0.418259I$ $b=\ \ 0.549935-0.398240I$	$0.82629-2.06681I$	$-9.98843-4.07433I$
$u=-1.114790-0.217503I$ $a=-0.607679+1.202920I$ $b=-0.473762+0.587754I$	$-3.31130+0.76131I$	$-16.5177-7.0538I$
$u=-1.114790-0.217503I$ $a=\ \ 1.44360-0.08135I$ $b=\ \ 1.064160+0.834405I$	$-3.31130+0.76131I$	$-16.5177-7.0538I$
$u=-1.114790-0.217503I$ $a=\ \ 0.20497-1.68305I$ $b=\ \ 0.169569-0.707717I$	$0.82629+3.58943I$	$-9.9884-10.0332I$
$u=-1.114790-0.217503I$ $a=-0.89228-1.71023I$ $b=\ \ 0.16710-1.83738I$	$0.82629-2.06681I$	$-9.98843-4.07433I$
$u=-1.114790-0.217503I$ $a=-2.28329+1.20421I$ $b=-2.25911-0.36278I$	$0.82629+3.58943I$	$-9.9884-10.0332I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.036120 + 0.567146I$ $a = 1.01651 - 1.00032I$ $b = 1.55710 - 0.11758I$	$-1.05947 - 7.59815I$	$-12.5535 + 8.9537I$
$u = 1.036120 + 0.567146I$ $a = 0.453618 - 0.242785I$ $b = -0.158539 + 0.631295I$	$3.07811 - 4.77002I$	$-6.02421 + 5.97424I$
$u = 1.036120 + 0.567146I$ $a = 1.54095 + 0.16723I$ $b = 0.254730 + 1.390570I$	$3.07811 - 4.77002I$	$-6.02421 + 5.97424I$
$u = 1.036120 + 0.567146I$ $a = -2.04587 + 0.19150I$ $b = -0.747009 - 0.934186I$	$-1.05947 - 7.59815I$	$-12.5535 + 8.9537I$
$u = 1.036120 + 0.567146I$ $a = 2.41243 + 0.36476I$ $b = 0.554917 + 0.941574I$	$3.07811 - 10.42630I$	$-6.02421 + 11.93313I$
$u = 1.036120 + 0.567146I$ $a = -2.01404 + 1.59108I$ $b = -2.53434 - 0.51839I$	$3.07811 - 10.42630I$	$-6.00000 + 11.93313I$
$u = 1.036120 - 0.567146I$ $a = 1.01651 + 1.00032I$ $b = 1.55710 + 0.11758I$	$-1.05947 + 7.59815I$	$-12.5535 - 8.9537I$
$u = 1.036120 - 0.567146I$ $a = 0.453618 + 0.242785I$ $b = -0.158539 - 0.631295I$	$3.07811 + 4.77002I$	$-6.02421 - 5.97424I$
$u = 1.036120 - 0.567146I$ $a = 1.54095 - 0.16723I$ $b = 0.254730 - 1.390570I$	$3.07811 + 4.77002I$	$-6.02421 - 5.97424I$
$u = 1.036120 - 0.567146I$ $a = -2.04587 - 0.19150I$ $b = -0.747009 + 0.934186I$	$-1.05947 + 7.59815I$	$-12.5535 - 8.9537I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.036120 - 0.567146I$ $a = 2.41243 - 0.36476I$ $b = 0.554917 - 0.941574I$	$3.07811 + 10.42630I$	$-6.02421 - 11.93313I$
$u = 1.036120 - 0.567146I$ $a = -2.01404 - 1.59108I$ $b = -2.53434 + 0.51839I$	$3.07811 + 10.42630I$	$-6.00000 - 11.93313I$
$u = -1.27340$ $a = 0.472652 + 0.998672I$ $b = 0.213480 + 0.705953I$	$2.29241 - 2.82812I$	$10.62384 + 2.97945I$
$u = -1.27340$ $a = 0.472652 - 0.998672I$ $b = 0.213480 - 0.705953I$	$2.29241 + 2.82812I$	$10.62384 - 2.97945I$
$u = -1.27340$ $a = 0.357688 + 0.621119I$ $b = 0.487641 + 0.545529I$	-1.84518	$4.09457 + 0.I$
$u = -1.27340$ $a = 0.357688 - 0.621119I$ $b = 0.487641 - 0.545529I$	-1.84518	$4.09457 + 0.I$
$u = -1.27340$ $a = -1.30418 + 1.70456I$ $b = -1.34711 + 1.66829I$	$2.29241 + 2.82812I$	$10.62384 - 2.97945I$
$u = -1.27340$ $a = -1.30418 - 1.70456I$ $b = -1.34711 - 1.66829I$	$2.29241 - 2.82812I$	$10.62384 + 2.97945I$
$u = 0.628447 + 0.282749I$ $a = 0.795222 + 0.001765I$ $b = 0.489252 - 1.046720I$	$0.62365 + 3.26203I$	$-10.84809 - 4.58696I$
$u = 0.628447 + 0.282749I$ $a = 1.39735 - 0.50505I$ $b = 0.09386 + 1.41761I$	$4.76123 + 0.43391I$	$-4.31882 - 1.60751I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.628447 + 0.282749I$ $a = -2.36179 + 0.49215I$ $b = -0.561481 + 1.188560I$	$4.76123 + 6.09015I$	$-4.31882 - 7.56641I$
$u = 0.628447 + 0.282749I$ $a = -0.56721 + 2.47674I$ $b = -1.042360 + 0.546394I$	$0.62365 + 3.26203I$	$-10.84809 - 4.58696I$
$u = 0.628447 + 0.282749I$ $a = 0.78323 - 2.60085I$ $b = 0.055365 - 0.290282I$	$4.76123 + 0.43391I$	$-4.31882 - 1.60751I$
$u = 0.628447 + 0.282749I$ $a = -0.34886 - 3.14808I$ $b = 1.69808 - 1.15277I$	$4.76123 + 6.09015I$	$-4.31882 - 7.56641I$
$u = 0.628447 - 0.282749I$ $a = 0.795222 - 0.001765I$ $b = 0.489252 + 1.046720I$	$0.62365 - 3.26203I$	$-10.84809 + 4.58696I$
$u = 0.628447 - 0.282749I$ $a = 1.39735 + 0.50505I$ $b = 0.09386 - 1.41761I$	$4.76123 - 0.43391I$	$-4.31882 + 1.60751I$
$u = 0.628447 - 0.282749I$ $a = -2.36179 - 0.49215I$ $b = -0.561481 - 1.188560I$	$4.76123 - 6.09015I$	$-4.31882 + 7.56641I$
$u = 0.628447 - 0.282749I$ $a = -0.56721 - 2.47674I$ $b = -1.042360 - 0.546394I$	$0.62365 - 3.26203I$	$-10.84809 + 4.58696I$
$u = 0.628447 - 0.282749I$ $a = 0.78323 + 2.60085I$ $b = 0.055365 + 0.290282I$	$4.76123 - 0.43391I$	$-4.31882 + 1.60751I$
$u = 0.628447 - 0.282749I$ $a = -0.34886 + 3.14808I$ $b = 1.69808 + 1.15277I$	$4.76123 - 6.09015I$	$-4.31882 + 7.56641I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.116220 + 0.690124I$ $a = -1.160590 - 0.166242I$ $b = -0.476263 - 1.118100I$	$7.09153 - 5.39210I$	$3.37762 + 5.59055I$
$u = 1.116220 + 0.690124I$ $a = -1.358910 - 0.144699I$ $b = -0.290166 - 0.979475I$	$2.95395 - 8.22022I$	$-3.15165 + 8.57000I$
$u = 1.116220 + 0.690124I$ $a = 1.16484 + 0.92477I$ $b = -0.565243 + 1.113750I$	$7.09153 - 5.39210I$	$3.37762 + 5.59055I$
$u = 1.116220 + 0.690124I$ $a = 1.65757 - 0.11395I$ $b = 0.745934 + 1.053680I$	$7.09153 - 11.04830I$	$3.37762 + 11.54944I$
$u = 1.116220 + 0.690124I$ $a = 1.67874 - 0.23637I$ $b = 0.80907 + 1.42372I$	$2.95395 - 8.22022I$	$-3.15165 + 8.57000I$
$u = 1.116220 + 0.690124I$ $a = -2.40534 + 0.24130I$ $b = -0.91074 - 2.08208I$	$7.09153 - 11.04830I$	$3.37762 + 11.54944I$
$u = 1.116220 - 0.690124I$ $a = -1.160590 + 0.166242I$ $b = -0.476263 + 1.118100I$	$7.09153 + 5.39210I$	$3.37762 - 5.59055I$
$u = 1.116220 - 0.690124I$ $a = -1.358910 + 0.144699I$ $b = -0.290166 + 0.979475I$	$2.95395 + 8.22022I$	$-3.15165 - 8.57000I$
$u = 1.116220 - 0.690124I$ $a = 1.16484 - 0.92477I$ $b = -0.565243 - 1.113750I$	$7.09153 + 5.39210I$	$3.37762 - 5.59055I$
$u = 1.116220 - 0.690124I$ $a = 1.65757 + 0.11395I$ $b = 0.745934 - 1.053680I$	$7.09153 + 11.04830I$	$3.37762 - 11.54944I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.116220 - 0.690124I$ $a = 1.67874 + 0.23637I$ $b = 0.80907 - 1.42372I$	$2.95395 + 8.22022I$	$-3.15165 - 8.57000I$
$u = 1.116220 - 0.690124I$ $a = -2.40534 - 0.24130I$ $b = -0.91074 + 2.08208I$	$7.09153 + 11.04830I$	$3.37762 - 11.54944I$
$u = 0.310562 + 0.497043I$ $a = 0.714476 - 1.044850I$ $b = -0.123456 + 1.404190I$	$4.77699 + 0.32096I$	$-2.07247 - 0.81483I$
$u = 0.310562 + 0.497043I$ $a = -1.07957 + 1.00521I$ $b = -0.384227 + 1.149880I$	$4.77699 + 5.97721I$	$-2.07247 - 6.77372I$
$u = 0.310562 + 0.497043I$ $a = 0.414948 - 0.164291I$ $b = 0.508974 - 0.961231I$	$0.63941 + 3.14909I$	$-8.60173 - 3.79428I$
$u = 0.310562 + 0.497043I$ $a = -0.48891 - 1.57968I$ $b = -0.254807 + 0.067957I$	$4.77699 + 0.32096I$	$-2.07247 - 0.81483I$
$u = 0.310562 + 0.497043I$ $a = 0.58626 + 1.57229I$ $b = -0.944697 + 0.064604I$	$0.63941 + 3.14909I$	$-8.60173 - 3.79428I$
$u = 0.310562 + 0.497043I$ $a = -1.47351 - 1.65389I$ $b = 1.77543 - 0.53762I$	$4.77699 + 5.97721I$	$-2.07247 - 6.77372I$
$u = 0.310562 - 0.497043I$ $a = 0.714476 + 1.044850I$ $b = -0.123456 - 1.404190I$	$4.77699 - 0.32096I$	$-2.07247 + 0.81483I$
$u = 0.310562 - 0.497043I$ $a = -1.07957 - 1.00521I$ $b = -0.384227 - 1.149880I$	$4.77699 - 5.97721I$	$-2.07247 + 6.77372I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.310562 - 0.497043I$ $a = \ 0.414948 + 0.164291I$ $b = \ 0.508974 + 0.961231I$	$0.63941 - 3.14909I$	$-8.60173 + 3.79428I$
$u = \ 0.310562 - 0.497043I$ $a = -0.48891 + 1.57968I$ $b = -0.254807 - 0.067957I$	$4.77699 - 0.32096I$	$-2.07247 + 0.81483I$
$u = \ 0.310562 - 0.497043I$ $a = \ 0.58626 - 1.57229I$ $b = -0.944697 - 0.064604I$	$0.63941 - 3.14909I$	$-8.60173 + 3.79428I$
$u = \ 0.310562 - 0.497043I$ $a = -1.47351 + 1.65389I$ $b = \ 1.77543 + 0.53762I$	$4.77699 - 5.97721I$	$-2.07247 + 6.77372I$

III.

$\boldsymbol{I_3^u = \langle -2.93\times 10^{8}u^{36}+1.80\times 10^{9}u^{35}+\cdots+8.74\times 10^{6}b+1.34\times 10^{9},\ -5.45\times 10^{8}u^{36}+3.32\times 10^{9}u^{35}+\cdots+1.46\times 10^{7}a+2.22\times 10^{9},\ u^{37}-7u^{36}+\cdots-27u+5\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -u \\ -u^3+u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 37.4040u^{36}-228.129u^{35}+\cdots+764.974u-152.498 \\ 33.5011u^{36}-206.596u^{35}+\cdots+740.373u-153.163 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 36.1521u^{36}-219.407u^{35}+\cdots+748.292u-156.108 \\ 28.5619u^{36}-177.132u^{35}+\cdots+663.711u-143.877 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 3.90295u^{36}-21.5330u^{35}+\cdots+24.6010u+0.665081 \\ 33.5011u^{36}-206.596u^{35}+\cdots+740.373u-153.163 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^3 \\ u^5-u^3+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 24.8450u^{36}-146.506u^{35}+\cdots+388.640u-67.1933 \\ 27.9413u^{36}-177.674u^{35}+\cdots+721.848u-156.557 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 11.7379u^{36}-65.7586u^{35}+\cdots+115.843u-13.0139 \\ -8.14190u^{36}+55.4654u^{35}+\cdots-322.793u+82.2197 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -6.36985u^{36}+50.3342u^{35}+\cdots-348.019u+87.8351 \\ 8.30698u^{36}-36.5225u^{35}+\cdots-89.9891u+38.1837 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -35.9768u^{36}+211.706u^{35}+\cdots-583.534u+107.249 \\ -21.4200u^{36}+127.666u^{35}+\cdots-363.918u+65.6570 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{87458410}{8736867}u^{36}-\frac{887104937}{8736867}u^{35}+\cdots+\frac{7705602655}{8736867}u-\frac{1868276791}{8736867}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{37} - 19u^{36} + \cdots + 79u - 25$
c_2	$u^{37} + 7u^{36} + \cdots - 27u - 5$
c_3, c_{10}	$u^{37} + 11u^{35} + \cdots + 36u - 5$
c_4, c_{11}	$u^{37} - u^{36} + \cdots + 6u - 1$
c_5	$u^{37} - 7u^{36} + \cdots - 27u + 5$
c_6, c_9	$u^{37} - u^{36} + \cdots + 6u - 1$
c_7	$u^{37} + 3u^{36} + \cdots - 8u - 1$
c_8	$u^{37} + 20u^{36} + \cdots - 171u - 27$
c_{12}	$u^{37} - 3u^{36} + \cdots - 8u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{37} + 9y^{36} + \cdots + 7691y - 625$
c_2, c_5	$y^{37} - 19y^{36} + \cdots + 79y - 25$
c_3, c_{10}	$y^{37} + 22y^{36} + \cdots + 136y - 25$
c_4, c_{11}	$y^{37} - 17y^{36} + \cdots + 36y - 1$
c_6, c_9	$y^{37} + 15y^{36} + \cdots - 46y - 1$
c_7, c_{12}	$y^{37} + 35y^{36} + \cdots - 48y - 1$
c_8	$y^{37} - 2y^{36} + \cdots - 26325y - 729$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.333646 + 0.939120I$ $a = -0.193011 + 0.172477I$ $b = -0.077533 - 1.147930I$	$7.09762 - 0.58324I$	$0.509552 - 0.585068I$
$u = 0.333646 - 0.939120I$ $a = -0.193011 - 0.172477I$ $b = -0.077533 + 1.147930I$	$7.09762 + 0.58324I$	$0.509552 + 0.585068I$
$u = 0.533649 + 0.867204I$ $a = -0.0765239 - 0.0499298I$ $b = -0.67640 + 1.32667I$	$7.99073 + 4.59338I$	$-1.20106 - 1.22376I$
$u = 0.533649 - 0.867204I$ $a = -0.0765239 + 0.0499298I$ $b = -0.67640 - 1.32667I$	$7.99073 - 4.59338I$	$-1.20106 + 1.22376I$
$u = 0.792978 + 0.640101I$ $a = 0.919478 - 0.731739I$ $b = 0.388945 - 0.532935I$	$6.62005 - 2.14265I$	$2.01818 + 2.23582I$
$u = 0.792978 - 0.640101I$ $a = 0.919478 + 0.731739I$ $b = 0.388945 + 0.532935I$	$6.62005 + 2.14265I$	$2.01818 - 2.23582I$
$u = -0.846359 + 0.590769I$ $a = -1.26327 - 1.40969I$ $b = -0.68500 + 1.46478I$	$6.24914 + 8.49563I$	$-1.47230 - 6.14964I$
$u = -0.846359 - 0.590769I$ $a = -1.26327 + 1.40969I$ $b = -0.68500 - 1.46478I$	$6.24914 - 8.49563I$	$-1.47230 + 6.14964I$
$u = 0.976057 + 0.444673I$ $a = 1.75420 + 0.64768I$ $b = 1.09532 + 1.06092I$	$4.66818 - 8.69558I$	$-2.35287 + 8.33858I$
$u = 0.976057 - 0.444673I$ $a = 1.75420 - 0.64768I$ $b = 1.09532 - 1.06092I$	$4.66818 + 8.69558I$	$-2.35287 - 8.33858I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.924863$ $a=-1.59939$ $b=-0.343954$	-3.12809	-16.5560
$u=-0.876737+0.629562I$ $a=-1.42305+0.01677I$ $b=\ \ 0.511199+1.259150I$	$6.14382-3.70973I$	$-1.48512+0.82345I$
$u=-0.876737-0.629562I$ $a=-1.42305-0.01677I$ $b=\ \ 0.511199-1.259150I$	$6.14382+3.70973I$	$-1.48512-0.82345I$
$u=\ \ 0.794699+0.434990I$ $a=-1.00134+1.93012I$ $b=-1.09272+1.33698I$	$5.31149+5.06761I$	$-0.913647-0.036371I$
$u=\ \ 0.794699-0.434990I$ $a=-1.00134-1.93012I$ $b=-1.09272-1.33698I$	$5.31149-5.06761I$	$-0.913647+0.036371I$
$u=\ \ 0.895946+0.681544I$ $a=-1.091620-0.248953I$ $b=-0.241094-0.184490I$	$6.29186-2.99378I$	$1.92058+3.39875I$
$u=\ \ 0.895946-0.681544I$ $a=-1.091620+0.248953I$ $b=-0.241094+0.184490I$	$6.29186+2.99378I$	$1.92058-3.39875I$
$u=-0.664550+0.523833I$ $a=\ \ 0.99217+1.45300I$ $b=\ \ 0.194593-1.101430I$	$5.75436+0.06331I$	$3.31684-1.50030I$
$u=-0.664550-0.523833I$ $a=\ \ 0.99217-1.45300I$ $b=\ \ 0.194593+1.101430I$	$5.75436-0.06331I$	$3.31684+1.50030I$
$u=\ \ 1.027800+0.577230I$ $a=-1.68851+0.31959I$ $b=-1.057550-0.628416I$	$0.09678-7.56844I$	$-3.66485+8.77182I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.027800 - 0.577230I$ $a = -1.68851 - 0.31959I$ $b = -1.057550 + 0.628416I$	$0.09678 + 7.56844I$	$-3.66485 - 8.77182I$
$u = -1.182280 + 0.004770I$ $a = 1.01586 - 1.23420I$ $b = 0.675453 - 0.845846I$	$1.69419 + 2.82666I$	$-6.95917 - 2.95818I$
$u = -1.182280 - 0.004770I$ $a = 1.01586 + 1.23420I$ $b = 0.675453 + 0.845846I$	$1.69419 - 2.82666I$	$-6.95917 + 2.95818I$
$u = -1.199150 + 0.208838I$ $a = -0.563970 - 0.686176I$ $b = -0.680833 - 0.201738I$	$-2.29418 - 0.52722I$	$-6.96195 + 8.29555I$
$u = -1.199150 - 0.208838I$ $a = -0.563970 + 0.686176I$ $b = -0.680833 + 0.201738I$	$-2.29418 + 0.52722I$	$-6.96195 - 8.29555I$
$u = 0.609931 + 0.471460I$ $a = 0.597543 - 1.084170I$ $b = 0.811091 - 0.876518I$	$1.49381 + 3.08924I$	$0.17374 - 3.08731I$
$u = 0.609931 - 0.471460I$ $a = 0.597543 + 1.084170I$ $b = 0.811091 + 0.876518I$	$1.49381 - 3.08924I$	$0.17374 + 3.08731I$
$u = -1.018500 + 0.695071I$ $a = 0.923604 + 0.232404I$ $b = 0.087588 - 1.181260I$	$4.42866 + 4.86200I$	$2.55162 - 5.76187I$
$u = -1.018500 - 0.695071I$ $a = 0.923604 - 0.232404I$ $b = 0.087588 + 1.181260I$	$4.42866 - 4.86200I$	$2.55162 + 5.76187I$
$u = 1.094260 + 0.679352I$ $a = 1.98156 - 0.24227I$ $b = 0.84829 + 1.35968I$	$6.28716 - 10.33440I$	$-6.00000 + 5.49342I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.094260 - 0.679352I$ $a = 1.98156 + 0.24227I$ $b = 0.84829 - 1.35968I$	$6.28716 + 10.33440I$	$-6.00000 - 5.49342I$
$u = 1.205990 + 0.732966I$ $a = -0.961555 - 0.187301I$ $b = -0.145823 - 1.137790I$	$4.49469 - 5.60603I$	0
$u = 1.205990 - 0.732966I$ $a = -0.961555 + 0.187301I$ $b = -0.145823 + 1.137790I$	$4.49469 + 5.60603I$	0
$u = 1.43625 + 0.16212I$ $a = -0.280153 - 0.406304I$ $b = -0.316656 - 0.764632I$	$-3.34090 - 5.49283I$	0
$u = 1.43625 - 0.16212I$ $a = -0.280153 + 0.406304I$ $b = -0.316656 + 0.764632I$	$-3.34090 + 5.49283I$	0
$u = 0.048816 + 0.512315I$ $a = -1.041720 - 0.364275I$ $b = 0.533101 - 0.653832I$	$1.66380 + 3.38344I$	$1.32925 - 5.64517I$
$u = 0.048816 - 0.512315I$ $a = -1.041720 + 0.364275I$ $b = 0.533101 + 0.653832I$	$1.66380 - 3.38344I$	$1.32925 + 5.64517I$

IV.

$\boldsymbol{I_4^u = \langle a^5 + a^4 - 3a^3 + 3a^2 + 45b - 27a - 18,\ a^6 - 3a^5 + 3a^4 - 9a^2 + 27,\ u + 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ -\frac{1}{45}a^5 - \frac{1}{45}a^4 + \cdots + \frac{3}{5}a + \frac{2}{5} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{4}{45}a^5 + \frac{2}{15}a^4 + \cdots + \frac{2}{5}a + \frac{8}{5} \\ -\frac{1}{3}a^2 + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{1}{45}a^5 + \frac{1}{45}a^4 + \cdots + \frac{2}{5}a - \frac{2}{5} \\ -\frac{1}{45}a^5 - \frac{1}{45}a^4 + \cdots + \frac{3}{5}a + \frac{2}{5} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{1}{45}a^5 - \frac{1}{45}a^4 + \cdots + \frac{3}{5}a + \frac{2}{5} \\ -\frac{2}{45}a^5 - \frac{2}{45}a^4 + \cdots + \frac{1}{5}a + \frac{4}{5} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{1}{45}a^5 - \frac{1}{45}a^4 + \cdots + \frac{3}{5}a + \frac{2}{5} \\ -\frac{2}{45}a^5 - \frac{2}{45}a^4 + \cdots + \frac{1}{5}a + \frac{4}{5} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{4}{45}a^5 + \frac{2}{15}a^4 + \cdots + \frac{2}{5}a + \frac{8}{5} \\ -\frac{1}{3}a^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -\frac{2}{45}a^5 + \frac{1}{15}a^4 + \cdots + \frac{6}{5}a + \frac{4}{5} \\ \frac{1}{45}a^5 - \frac{4}{45}a^4 + \cdots + \frac{2}{5}a - \frac{2}{5} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{4}{45}a^5 + \frac{4}{45}a^4 - \frac{4}{15}a^3 + \frac{4}{15}a^2 + \frac{8}{5}a - \frac{53}{5}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.00000$ $a=-1.132320+0.653743I$ $b=-0.377439+0.653743I$	-2.75839	$-12.01951+0.I$
$u=-1.00000$ $a=-1.132320-0.653743I$ $b=-0.377439-0.653743I$	-2.75839	$-12.01951+0.I$
$u=-1.00000$ $a=\ \ 1.96123+0.35741I$ $b=\ \ 1.083790-0.387453I$	$1.37919-2.82812I$	$-5.49024+2.97945I$
$u=-1.00000$ $a=\ \ 1.96123-0.35741I$ $b=\ \ 1.083790+0.387453I$	$1.37919+2.82812I$	$-5.49024-2.97945I$
$u=-1.00000$ $a=\ \ 0.67109+1.87718I$ $b=-0.206350+1.132320I$	$1.37919-2.82812I$	$-5.49024+2.97945I$
$u=-1.00000$ $a=\ \ 0.67109-1.87718I$ $b=-0.206350-1.132320I$	$1.37919+2.82812I$	$-5.49024-2.97945I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^6)(u^{19}+8u^{18}+\cdots+4u+1)^6(u^{37}-19u^{36}+\cdots+79u-25)$ $\cdot(u^{58}+26u^{57}+\cdots+83456u+4096)$
c_2	$((u-1)^6)(u^{19}-2u^{18}+\cdots-4u+1)^6(u^{37}+7u^{36}+\cdots-27u-5)$ $\cdot(u^{58}+14u^{57}+\cdots-928u-64)$
c_3, c_{10}	$(u^6+u^5+u^4+2u^3+u^2+1)(u^{37}+11u^{35}+\cdots+36u-5)$ $\cdot(u^{58}+17u^{56}+\cdots+461u-77)$ $\cdot(u^{114}-2u^{113}+\cdots-4054780664u+1331355377)$
c_4, c_{11}	$(u^6+u^5+u^4+2u^3+u^2+1)(u^{37}-u^{36}+\cdots+6u-1)$ $\cdot(u^{58}-u^{57}+\cdots+u+1)(u^{114}-4u^{113}+\cdots-2666478u+405443)$
c_5	$((u+1)^6)(u^{19}-2u^{18}+\cdots-4u+1)^6(u^{37}-7u^{36}+\cdots-27u+5)$ $\cdot(u^{58}+14u^{57}+\cdots-928u-64)$
c_6, c_9	$((u^3+u^2-1)^2)(u^{37}-u^{36}+\cdots+6u-1)(u^{58}-u^{57}+\cdots+17u-1)$ $\cdot(u^{114}+3u^{113}+\cdots+3197956u+281947)$
c_7	$((u^3-u^2+2u-1)^{40})(u^{37}+3u^{36}+\cdots-8u-1)$ $\cdot(u^{58}+40u^{57}+\cdots-7340032u-262144)$
c_8	$u^6(u^{19}-9u^{18}+\cdots-u+2)^6(u^{37}+20u^{36}+\cdots-171u-27)$ $\cdot(u^{58}+45u^{57}+\cdots+80u+8)$
c_{12}	$((u^3-u^2+2u-1)^{38})(u^3+u^2+2u+1)^2(u^{37}-3u^{36}+\cdots-8u+1)$ $\cdot(u^{58}+40u^{57}+\cdots-7340032u-262144)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^6)(y^{19}+8y^{18}+\cdots-16y-1)^6$ $\cdot(y^{37}+9y^{36}+\cdots+7691y-625)$ $\cdot(y^{58}+18y^{57}+\cdots+5636096y+16777216)$
c_2, c_5	$((y-1)^6)(y^{19}-8y^{18}+\cdots+4y-1)^6(y^{37}-19y^{36}+\cdots+79y-25)$ $\cdot(y^{58}-26y^{57}+\cdots-83456y+4096)$
c_3, c_{10}	$(y^6+y^5-y^4+3y^2+2y+1)(y^{37}+22y^{36}+\cdots+136y-25)$ $\cdot(y^{58}+34y^{57}+\cdots-273813y+5929)$ $\cdot(y^{114}+64y^{113}+\cdots+6.82\times10^{19}y+1.77\times10^{18})$
c_4, c_{11}	$(y^6+y^5-y^4+3y^2+2y+1)(y^{37}-17y^{36}+\cdots+36y-1)$ $\cdot(y^{58}-5y^{57}+\cdots-9y+1)$ $\cdot(y^{114}-44y^{113}+\cdots-7420008525078y+164384026249)$
c_6, c_9	$((y^3-y^2+2y-1)^2)(y^{37}+15y^{36}+\cdots-46y-1)$ $\cdot(y^{58}+11y^{57}+\cdots-211y+1)$ $\cdot(y^{114}+49y^{113}+\cdots+72527526349296y+79494110809)$
c_7, c_{12}	$((y^3+3y^2+2y-1)^{40})(y^{37}+35y^{36}+\cdots-48y-1)$ $\cdot(y^{58}+38y^{57}+\cdots-1030792151040y+68719476736)$
c_8	$y^6(y^{19}-3y^{18}+\cdots+37y-4)^6(y^{37}-2y^{36}+\cdots-26325y-729)$ $\cdot(y^{58}-5y^{57}+\cdots+1760y+64)$