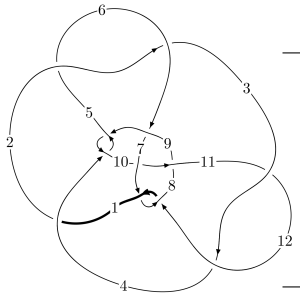
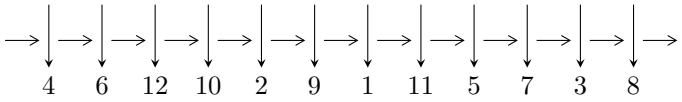
$12a_{1004}$ $(K12a_{1004})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle 2.50144 \times 10^{15} u^{30} + 1.24069 \times 10^{15} u^{29} + \cdots + 2.15585 \times 10^{16} b + 1.38288 \times 10^{16}, \\
&\quad - 5.21559 \times 10^{15} u^{30} + 7.73030 \times 10^{12} u^{29} + \cdots + 2.15585 \times 10^{16} a - 2.45094 \times 10^{16}, \\
&\quad u^{31} + 11 u^{29} + \cdots + 12u + 4 \rangle \\
I_2^u &= \langle 1.75494 \times 10^{735} u^{149} + 8.27613 \times 10^{735} u^{148} + \cdots + 4.56524 \times 10^{736} b + 8.92522 \times 10^{738}, \\
&\quad - 1.97153 \times 10^{738} u^{149} - 3.62879 \times 10^{738} u^{148} + \cdots + 1.39848 \times 10^{739} a - 5.96878 \times 10^{740}, \\
&\quad u^{150} + 2u^{149} + \cdots - 2018u + 919 \rangle \\
I_3^u &= \langle u^5 + u^4 + 2u^3 + u^2 + 2b + u - 1,\ -u^5 - u^4 - 2u^3 + u^2 + 2a - u + 3,\ u^6 + 3u^4 - u^3 + 2u^2 - 2u - 1 \rangle \\
I_4^u &= \langle 4.40374 \times 10^{51} u^{45} - 8.43737 \times 10^{51} u^{44} + \cdots + 5.41181 \times 10^{50} b - 4.27132 \times 10^{52}, \\
&\quad - 3.42335 \times 10^{52} u^{45} + 1.28492 \times 10^{52} u^{44} + \cdots + 1.08236 \times 10^{51} a - 1.08479 \times 10^{53},\ u^{46} - u^{45} + \cdots + 12u +
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 233 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. $\boldsymbol{I_1^u = \langle 2.50 \times 10^{15} u^{30} + 1.24 \times 10^{15} u^{29} + \cdots + 2.16 \times 10^{16} b + 1.38 \times 10^{16},\ -5.22 \times 10^{15} u^{30} + 7.73 \times 10^{12} u^{29} + \cdots + 2.16 \times 10^{16} a - 2.45 \times 10^{16},\ u^{31} + 11 u^{29} + \cdots + 12u + 4 \rangle}$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.241927u^{30} - 0.000358573u^{29} + \cdots + 1.43030u + 1.13688 \\ -0.116030u^{30} - 0.0575497u^{29} + \cdots - 2.58346u - 0.641452 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.125897u^{30} - 0.0579082u^{29} + \cdots - 1.15316u + 0.495428 \\ -0.116030u^{30} - 0.0575497u^{29} + \cdots - 2.58346u - 0.641452 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.267306u^{30} - 0.0879097u^{29} + \cdots + 1.72413u + 0.957239 \\ -0.0656034u^{30} - 0.0724256u^{29} + \cdots - 0.829228u - 0.181723 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.187341u^{30} - 0.218241u^{29} + \cdots + 0.377796u + 0.202808 \\ -0.111050u^{30} - 0.0423717u^{29} + \cdots + 0.523194u + 0.118533 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.0594148u^{30} + 0.278830u^{29} + \cdots + 2.92868u + 0.485553 \\ 0.144722u^{30} - 0.0776651u^{29} + \cdots - 0.277149u - 0.426960 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.146036u^{30} - 0.204690u^{29} + \cdots - 5.94370u - 0.605131 \\ -0.0842819u^{30} + 0.0793837u^{29} + \cdots - 0.316602u + 0.243659 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.303630u^{30} - 0.0612345u^{29} + \cdots + 2.62375u + 0.925578 \\ -0.0609509u^{30} + 0.00637618u^{29} + \cdots - 0.395007u - 0.320084 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.180693u^{30} - 0.116290u^{29} + \cdots - 1.28768u - 0.0776417 \\ -0.109654u^{30} - 0.0500993u^{29} + \cdots - 2.17214u - 0.397648 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{9688058052053989}{62715688746323008}u^{30} + \frac{39488066647219475}{62715688746323008}u^{29} + \cdots + \frac{22360344283783987}{3919730546645188}u - \frac{238434930063801187}{15678922186580752}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{31} - 10u^{30} + \cdots + 3180u + 792$
c_2, c_3, c_5 c_{11}	$2(2u^{31} + u^{30} + \cdots + 6u + 1)$
c_4, c_7, c_9 c_{12}	$u^{31} + 11u^{29} + \cdots + 12u + 4$
c_6, c_8	$u^{31} - 2u^{30} + \cdots + 17u + 4$
c_{10}	$4(4u^{31} + 67u^{30} + \cdots + 1040u + 104)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{31} + 2y^{30} + \cdots + 13128336y - 627264$
c_2, c_3, c_5 c_{11}	$4(4y^{31} - 61y^{30} + \cdots + 20y - 1)$
c_4, c_7, c_9 c_{12}	$y^{31} + 22y^{30} + \cdots + 96y - 16$
c_6, c_8	$y^{31} + 14y^{30} + \cdots + 105y - 16$
c_{10}	$16(16y^{31} - 49y^{30} + \cdots + 106912y - 10816)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.383328 + 0.813662I$ $a = 0.490897 + 0.768652I$ $b = 0.884559 - 0.136812I$	$-1.59008 - 1.84478I$	$-16.5634 + 3.3949I$
$u = 0.383328 - 0.813662I$ $a = 0.490897 - 0.768652I$ $b = 0.884559 + 0.136812I$	$-1.59008 + 1.84478I$	$-16.5634 - 3.3949I$
$u = 1.070470 + 0.329267I$ $a = -0.1172980 - 0.0191354I$ $b = -1.260470 + 0.477995I$	$-6.38658 + 8.07639I$	$-17.3230 - 5.6061I$
$u = 1.070470 - 0.329267I$ $a = -0.1172980 + 0.0191354I$ $b = -1.260470 - 0.477995I$	$-6.38658 - 8.07639I$	$-17.3230 + 5.6061I$
$u = -0.038964 + 0.879008I$ $a = 0.26251 + 2.53537I$ $b = -0.968074 - 0.655155I$	$0.53762 - 4.18229I$	$-8.93395 + 4.77809I$
$u = -0.038964 - 0.879008I$ $a = 0.26251 - 2.53537I$ $b = -0.968074 + 0.655155I$	$0.53762 + 4.18229I$	$-8.93395 - 4.77809I$
$u = -0.807575 + 0.281045I$ $a = 0.354252 - 0.171232I$ $b = -1.266270 - 0.341594I$	$-5.89222 - 2.10069I$	$-18.4399 + 0.8290I$
$u = -0.807575 - 0.281045I$ $a = 0.354252 + 0.171232I$ $b = -1.266270 + 0.341594I$	$-5.89222 + 2.10069I$	$-18.4399 - 0.8290I$
$u = -0.509694 + 1.139090I$ $a = 0.15388 - 1.50487I$ $b = -0.649674 + 0.372347I$	$0.79845 + 6.17925I$	$-12.61058 - 5.13272I$
$u = -0.509694 - 1.139090I$ $a = 0.15388 + 1.50487I$ $b = -0.649674 - 0.372347I$	$0.79845 - 6.17925I$	$-12.61058 + 5.13272I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.258230+1.244910I$ $a=-0.41437-2.09862I$ $b=-0.981776+0.445465I$	$3.58488+8.85757I$	$-8.38851-10.74241I$
$u=-0.258230-1.244910I$ $a=-0.41437+2.09862I$ $b=-0.981776-0.445465I$	$3.58488-8.85757I$	$-8.38851+10.74241I$
$u=-0.558604+1.155740I$ $a=-0.366123-0.135434I$ $b=\ \ 0.899543+0.557800I$	$2.74768-0.19116I$	$-7.37244+2.08773I$
$u=-0.558604-1.155740I$ $a=-0.366123+0.135434I$ $b=\ \ 0.899543-0.557800I$	$2.74768+0.19116I$	$-7.37244-2.08773I$
$u=\ \ 0.383183+1.225150I$ $a=-0.64267-1.59359I$ $b=\ \ 1.34293+0.84208I$	$0.23602-10.85600I$	$-10.2697+11.6694I$
$u=\ \ 0.383183-1.225150I$ $a=-0.64267+1.59359I$ $b=\ \ 1.34293-0.84208I$	$0.23602+10.85600I$	$-10.2697-11.6694I$
$u=\ \ 0.441579+1.215660I$ $a=\ \ 0.279092-1.192030I$ $b=-0.192360+1.107890I$	$6.66804-7.94380I$	$-5.46409+6.49661I$
$u=\ \ 0.441579-1.215660I$ $a=\ \ 0.279092+1.192030I$ $b=-0.192360-1.107890I$	$6.66804+7.94380I$	$-5.46409-6.49661I$
$u=\ \ 0.700279+1.092210I$ $a=-0.66429+1.28471I$ $b=-0.824149-0.631671I$	$3.27893-9.24231I$	$-7.94202+11.05232I$
$u=\ \ 0.700279-1.092210I$ $a=-0.66429-1.28471I$ $b=-0.824149+0.631671I$	$3.27893+9.24231I$	$-7.94202-11.05232I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.031247 + 1.321110I$ $a = -0.146418 + 0.997579I$ $b = -0.147308 - 0.798761I$	$8.82763 - 2.25729I$	$-0.71517 + 3.43143I$
$u = 0.031247 - 1.321110I$ $a = -0.146418 - 0.997579I$ $b = -0.147308 + 0.798761I$	$8.82763 + 2.25729I$	$-0.71517 - 3.43143I$
$u = 0.113033 + 1.391790I$ $a = -1.41835 + 0.33002I$ $b = 0.764199 - 0.058208I$	$6.32535 - 3.39686I$	$-18.8474 + 2.2372I$
$u = 0.113033 - 1.391790I$ $a = -1.41835 - 0.33002I$ $b = 0.764199 + 0.058208I$	$6.32535 + 3.39686I$	$-18.8474 - 2.2372I$
$u = -0.588800 + 0.060054I$ $a = 0.889305 + 0.058898I$ $b = 0.385009 + 0.352343I$	$-0.533538 + 0.055476I$	$-12.22757 + 0.28015I$
$u = -0.588800 - 0.060054I$ $a = 0.889305 - 0.058898I$ $b = 0.385009 - 0.352343I$	$-0.533538 - 0.055476I$	$-12.22757 - 0.28015I$
$u = 0.498181 + 0.318586I$ $a = 2.21809 - 0.66774I$ $b = 0.776069 - 0.373133I$	$-2.64416 + 2.93302I$	$-20.2796 - 2.5092I$
$u = 0.498181 - 0.318586I$ $a = 2.21809 + 0.66774I$ $b = 0.776069 + 0.373133I$	$-2.64416 - 2.93302I$	$-20.2796 + 2.5092I$
$u = -0.66403 + 1.33370I$ $a = -0.12218 + 1.55945I$ $b = 1.31916 - 0.68794I$	$-0.0102 + 20.8448I$	$-11.8902 - 10.7471I$
$u = -0.66403 - 1.33370I$ $a = -0.12218 - 1.55945I$ $b = 1.31916 + 0.68794I$	$-0.0102 - 20.8448I$	$-11.8902 + 10.7471I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.390808$		
$a=\ \ 0.987357$	-0.641880	-14.9490
$b=\ \ 0.337219$		

II. $\boldsymbol{I_2^u = \langle 1.75 \times 10^{735} u^{149} + 8.28 \times 10^{735} u^{148} + \cdots + 4.57 \times 10^{736} b + 8.93 \times 10^{738},\ -1.97 \times 10^{738} u^{149} - 3.63 \times 10^{738} u^{148} + \cdots + 1.40 \times 10^{739} a - 5.97 \times 10^{740},\ u^{150} + 2u^{149} + \cdots - 2018u + 919 \rangle}$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.140976u^{149} + 0.259480u^{148} + \cdots + 82.9270u + 42.6804 \\ -0.0384414u^{149} - 0.181286u^{148} + \cdots + 172.135u - 195.504 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.102535u^{149} + 0.0781942u^{148} + \cdots + 255.062u - 152.823 \\ -0.0384414u^{149} - 0.181286u^{148} + \cdots + 172.135u - 195.504 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.0527453u^{149} + 0.135239u^{148} + \cdots - 205.782u + 94.4901 \\ -0.124909u^{149} - 0.285605u^{148} + \cdots - 435.520u + 80.3466 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.191319u^{149} - 1.05657u^{148} + \cdots + 1145.26u - 817.448 \\ -0.154653u^{149} - 0.481473u^{148} + \cdots - 54.1775u - 24.3770 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.286348u^{149} + 0.609107u^{148} + \cdots + 253.359u + 104.157 \\ -0.0788148u^{149} - 0.229913u^{148} + \cdots - 125.252u + 5.41964 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.648465u^{149} - 1.52286u^{148} + \cdots - 771.712u - 73.5282 \\ 0.0450857u^{149} + 0.0633439u^{148} + \cdots + 404.505u - 140.573 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0777436u^{149} + 0.213415u^{148} + \cdots - 186.573u + 133.827 \\ -0.0882209u^{149} - 0.186805u^{148} + \cdots - 382.419u + 93.7867 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.358685u^{149} + 1.26422u^{148} + \cdots - 822.439u + 754.747 \\ 0.0215969u^{149} + 0.0830095u^{148} + \cdots + 94.3670u - 104.822 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -0.246889u^{149} - 1.99031u^{148} + \cdots + 2745.00u - 2218.10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{75}+u^{74}+\cdots-8855u+8613)^2$
c_2, c_3, c_5 c_{11}	$u^{150}+2u^{149}+\cdots+1677010u+170479$
c_4, c_7, c_9 c_{12}	$u^{150}+2u^{149}+\cdots-2018u+919$
c_6, c_8	$u^{150}-11u^{149}+\cdots-497109u+23211$
c_{10}	$(u^{75}-14u^{74}+\cdots+3u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{75} - 5y^{74} + \cdots - 714208913y - 74183769)^2$
c_2, c_3, c_5 c_{11}	$y^{150} - 90y^{149} + \cdots - 927470682466y + 29063089441$
c_4, c_7, c_9 c_{12}	$y^{150} + 80y^{149} + \cdots + 32014968y + 844561$
c_6, c_8	$y^{150} - 25y^{149} + \cdots - 6938889327y + 538750521$
c_{10}	$(y^{75} - 40y^{74} + \cdots - 283y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.250266+0.977052I$ $a=\ \ 0.80676-1.47322I$ $b=-0.760581+0.919565I$	2.08475	0
$u=-0.250266-0.977052I$ $a=\ \ 0.80676+1.47322I$ $b=-0.760581-0.919565I$	2.08475	0
$u=\ \ 0.655265+0.743088I$ $a=\ \ 0.387229-1.131810I$ $b=\ \ 0.923417-0.212960I$	$-2.72280+3.03687I$	0
$u=\ \ 0.655265-0.743088I$ $a=\ \ 0.387229+1.131810I$ $b=\ \ 0.923417+0.212960I$	$-2.72280-3.03687I$	0
$u=-0.400769+0.901756I$ $a=\ \ 0.706701+0.969647I$ $b=\ \ 0.759020-0.470826I$	$0.183461-0.643254I$	0
$u=-0.400769-0.901756I$ $a=\ \ 0.706701-0.969647I$ $b=\ \ 0.759020+0.470826I$	$0.183461+0.643254I$	0
$u=-0.036000+0.978779I$ $a=-0.436667+0.213218I$ $b=\ \ 0.456001-0.628144I$	$1.28163+4.74782I$	0
$u=-0.036000-0.978779I$ $a=-0.436667-0.213218I$ $b=\ \ 0.456001+0.628144I$	$1.28163-4.74782I$	0
$u=-0.546343+0.804601I$ $a=-0.62861+1.63725I$ $b=\ \ 1.36068-0.45263I$	$-3.91595-4.23228I$	0
$u=-0.546343-0.804601I$ $a=-0.62861-1.63725I$ $b=\ \ 1.36068+0.45263I$	$-3.91595+4.23228I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.216397 + 0.943779I$ $a = -0.74672 + 1.91237I$ $b = 0.24646 - 1.52907I$	$7.63312 - 0.89997I$	0
$u = 0.216397 - 0.943779I$ $a = -0.74672 - 1.91237I$ $b = 0.24646 + 1.52907I$	$7.63312 + 0.89997I$	0
$u = 0.349373 + 0.899365I$ $a = -0.16996 - 2.06139I$ $b = 1.407160 + 0.040470I$	$-5.99442 - 2.26352I$	0
$u = 0.349373 - 0.899365I$ $a = -0.16996 + 2.06139I$ $b = 1.407160 - 0.040470I$	$-5.99442 + 2.26352I$	0
$u = 0.441210 + 0.941201I$ $a = -0.57467 - 1.77607I$ $b = 1.40592 + 0.41005I$	$-6.53345 - 2.32464I$	0
$u = 0.441210 - 0.941201I$ $a = -0.57467 + 1.77607I$ $b = 1.40592 - 0.41005I$	$-6.53345 + 2.32464I$	0
$u = -0.188199 + 1.057230I$ $a = 1.32209 - 2.15726I$ $b = -1.53250 + 1.80873I$	2.35174	0
$u = -0.188199 - 1.057230I$ $a = 1.32209 + 2.15726I$ $b = -1.53250 - 1.80873I$	2.35174	0
$u = 0.408850 + 1.007140I$ $a = -0.16808 + 1.42574I$ $b = 0.235347 - 0.899173I$	$-1.02208 - 2.05598I$	0
$u = 0.408850 - 1.007140I$ $a = -0.16808 - 1.42574I$ $b = 0.235347 + 0.899173I$	$-1.02208 + 2.05598I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.006600 + 0.438885I$ $a = 0.393281 - 0.145454I$ $b = 1.047080 - 0.364356I$	$-2.45707 + 3.31723I$	0
$u = 1.006600 - 0.438885I$ $a = 0.393281 + 0.145454I$ $b = 1.047080 + 0.364356I$	$-2.45707 - 3.31723I$	0
$u = 0.352204 + 0.825566I$ $a = 0.25726 + 2.29475I$ $b = -0.799291 - 0.233085I$	$-1.98483 - 1.30642I$	0
$u = 0.352204 - 0.825566I$ $a = 0.25726 - 2.29475I$ $b = -0.799291 + 0.233085I$	$-1.98483 + 1.30642I$	0
$u = 0.686439 + 0.578140I$ $a = -0.427492 + 1.035030I$ $b = 0.570528 - 0.667568I$	$-2.17590 - 1.99776I$	0
$u = 0.686439 - 0.578140I$ $a = -0.427492 - 1.035030I$ $b = 0.570528 + 0.667568I$	$-2.17590 + 1.99776I$	0
$u = -0.390466 + 1.057110I$ $a = 0.42845 - 2.10170I$ $b = -1.008840 + 0.388689I$	$1.22970 + 5.73765I$	0
$u = -0.390466 - 1.057110I$ $a = 0.42845 + 2.10170I$ $b = -1.008840 - 0.388689I$	$1.22970 - 5.73765I$	0
$u = 0.690066 + 0.891775I$ $a = 0.570034 - 0.418838I$ $b = -1.180320 + 0.478317I$	$-1.31289 - 1.98120I$	0
$u = 0.690066 - 0.891775I$ $a = 0.570034 + 0.418838I$ $b = -1.180320 - 0.478317I$	$-1.31289 + 1.98120I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.855453+0.164095I$ $a=-0.010839-0.625499I$ $b=\ \ 0.495355+0.458806I$	$-1.98483-1.30642I$	0
$u=-0.855453-0.164095I$ $a=-0.010839+0.625499I$ $b=\ \ 0.495355-0.458806I$	$-1.98483+1.30642I$	0
$u=-0.143310+0.855821I$ $a=-0.73462-1.57560I$ $b=\ \ 1.36640+0.80674I$	$1.37427+1.78291I$	0
$u=-0.143310-0.855821I$ $a=-0.73462+1.57560I$ $b=\ \ 1.36640-0.80674I$	$1.37427-1.78291I$	0
$u=-0.447485+0.730129I$ $a=-0.55154-1.88716I$ $b=-1.026360+0.533608I$	$1.28163+4.74782I$	0
$u=-0.447485-0.730129I$ $a=-0.55154+1.88716I$ $b=-1.026360-0.533608I$	$1.28163-4.74782I$	0
$u=\ \ 0.323505+0.787742I$ $a=\ \ 0.40619+2.39052I$ $b=-0.633653-0.516123I$	$-1.80519-1.37797I$	0
$u=\ \ 0.323505-0.787742I$ $a=\ \ 0.40619-2.39052I$ $b=-0.633653+0.516123I$	$-1.80519+1.37797I$	0
$u=-0.271186+1.121900I$ $a=\ \ 0.73438+1.46158I$ $b=\ \ 1.109690-0.265505I$	$4.56771+4.91013I$	0
$u=-0.271186-1.121900I$ $a=\ \ 0.73438-1.46158I$ $b=\ \ 1.109690+0.265505I$	$4.56771-4.91013I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.262446 + 0.799550I$ $a = -0.97084 + 1.71487I$ $b = -1.46685 - 0.09403I$	$-6.45947 - 0.53044I$	0
$u = 0.262446 - 0.799550I$ $a = -0.97084 - 1.71487I$ $b = -1.46685 + 0.09403I$	$-6.45947 + 0.53044I$	0
$u = 0.181012 + 1.145580I$ $a = 0.420619 - 0.818133I$ $b = -0.498012 + 0.701152I$	$3.32569 + 0.65529I$	0
$u = 0.181012 - 1.145580I$ $a = 0.420619 + 0.818133I$ $b = -0.498012 - 0.701152I$	$3.32569 - 0.65529I$	0
$u = -0.769142 + 0.335251I$ $a = 0.414701 - 0.652623I$ $b = 0.656441 - 0.016514I$	$-1.80519 - 1.37797I$	0
$u = -0.769142 - 0.335251I$ $a = 0.414701 + 0.652623I$ $b = 0.656441 + 0.016514I$	$-1.80519 + 1.37797I$	0
$u = 0.247354 + 1.136450I$ $a = 0.86297 + 1.68247I$ $b = -0.777734 - 1.089730I$	$1.37427 - 1.78291I$	0
$u = 0.247354 - 1.136450I$ $a = 0.86297 - 1.68247I$ $b = -0.777734 + 1.089730I$	$1.37427 + 1.78291I$	0
$u = 0.379505 + 0.739562I$ $a = 0.892661 - 0.151906I$ $b = 1.176190 + 0.092279I$	$-2.17590 - 1.99776I$	0
$u = 0.379505 - 0.739562I$ $a = 0.892661 + 0.151906I$ $b = 1.176190 - 0.092279I$	$-2.17590 + 1.99776I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.300646+1.132930I$ $a=-1.23861+2.25342I$ $b=\ \ 1.146840-0.271611I$	$-1.21344+9.83163I$	0
$u=-0.300646-1.132930I$ $a=-1.23861-2.25342I$ $b=\ \ 1.146840+0.271611I$	$-1.21344-9.83163I$	0
$u=-0.450164+1.093910I$ $a=-0.63467-1.36529I$ $b=\ \ 0.284143+1.328500I$	$-0.03753+7.18574I$	0
$u=-0.450164-1.093910I$ $a=-0.63467+1.36529I$ $b=\ \ 0.284143-1.328500I$	$-0.03753-7.18574I$	0
$u=-0.402909+0.708552I$ $a=\ \ 0.803206-0.484338I$ $b=-1.68528-0.02177I$	$-4.26915+8.26207I$	0
$u=-0.402909-0.708552I$ $a=\ \ 0.803206+0.484338I$ $b=-1.68528+0.02177I$	$-4.26915-8.26207I$	0
$u=\ \ 0.843514+0.850015I$ $a=\ \ 0.739905-0.777530I$ $b=\ \ 0.625540+0.403159I$	$3.59312-3.90956I$	0
$u=\ \ 0.843514-0.850015I$ $a=\ \ 0.739905+0.777530I$ $b=\ \ 0.625540-0.403159I$	$3.59312+3.90956I$	0
$u=\ \ 0.256490+1.187730I$ $a=\ \ 0.78680-1.33207I$ $b=-0.454776+1.149360I$	$6.19587+1.47709I$	0
$u=\ \ 0.256490-1.187730I$ $a=\ \ 0.78680+1.33207I$ $b=-0.454776-1.149360I$	$6.19587-1.47709I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.554540+1.088720I$ $a=-0.259263-1.328640I$ $b=-0.998413+0.555368I$	$1.83771+4.15446I$	0
$u=-0.554540-1.088720I$ $a=-0.259263+1.328640I$ $b=-0.998413-0.555368I$	$1.83771-4.15446I$	0
$u=\ \ 0.768907+0.115120I$ $a=-1.109670+0.765255I$ $b=-0.008615-0.858346I$	$0.07161+9.29331I$	0
$u=\ \ 0.768907-0.115120I$ $a=-1.109670-0.765255I$ $b=-0.008615+0.858346I$	$0.07161-9.29331I$	0
$u=-0.462373+1.141140I$ $a=-0.13970+1.63210I$ $b=\ \ 1.41592-0.58875I$	$3.21020+7.96938I$	0
$u=-0.462373-1.141140I$ $a=-0.13970-1.63210I$ $b=\ \ 1.41592+0.58875I$	$3.21020-7.96938I$	0
$u=-0.387293+1.181570I$ $a=\ \ 0.479022+0.905676I$ $b=-0.329614-0.909267I$	$2.94502+3.75977I$	0
$u=-0.387293-1.181570I$ $a=\ \ 0.479022-0.905676I$ $b=-0.329614+0.909267I$	$2.94502-3.75977I$	0
$u=\ \ 0.422255+0.626342I$ $a=\ \ 0.432656+0.749631I$ $b=-1.59437+0.11877I$	$-7.50514-1.37117I$	0
$u=\ \ 0.422255-0.626342I$ $a=\ \ 0.432656-0.749631I$ $b=-1.59437-0.11877I$	$-7.50514+1.37117I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.751881+0.054661I$ $a=\ 0.776209+0.365607I$ $b=\ 0.985866-0.530921I$	$0.183461+0.643254I$	0
$u=-0.751881-0.054661I$ $a=\ 0.776209-0.365607I$ $b=\ 0.985866+0.530921I$	$0.183461-0.643254I$	0
$u=\ 0.072438+0.748710I$ $a=\ 0.04199+3.88290I$ $b=\ 0.646521-0.073430I$	$0.90150-8.00755I$	0
$u=\ 0.072438-0.748710I$ $a=\ 0.04199-3.88290I$ $b=\ 0.646521+0.073430I$	$0.90150+8.00755I$	0
$u=-1.252590+0.223473I$ $a=-0.100363+0.250425I$ $b=-1.240240-0.498985I$	$-3.5371-14.1696I$	0
$u=-1.252590-0.223473I$ $a=-0.100363-0.250425I$ $b=-1.240240+0.498985I$	$-3.5371+14.1696I$	0
$u=-0.448926+1.198050I$ $a=-0.07328-1.78279I$ $b=-1.202550+0.678910I$	$3.71261+4.93092I$	0
$u=-0.448926-1.198050I$ $a=-0.07328+1.78279I$ $b=-1.202550-0.678910I$	$3.71261-4.93092I$	0
$u=\ 0.698619+0.137185I$ $a=\ 1.301690+0.042161I$ $b=\ 0.041138-0.388436I$	$2.94502-3.75977I$	0
$u=\ 0.698619-0.137185I$ $a=\ 1.301690-0.042161I$ $b=\ 0.041138+0.388436I$	$2.94502+3.75977I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.461652+1.209270I$ $a=\ \ 0.692743+0.557834I$ $b=-0.723844-0.803902I$	$3.59312+3.90956I$	0
$u=-0.461652-1.209270I$ $a=\ \ 0.692743-0.557834I$ $b=-0.723844+0.803902I$	$3.59312-3.90956I$	0
$u=-0.713496+1.081450I$ $a=-0.21277+1.54177I$ $b=\ \ 1.150550-0.689190I$	$-3.68004+7.53499I$	0
$u=-0.713496-1.081450I$ $a=-0.21277-1.54177I$ $b=\ \ 1.150550+0.689190I$	$-3.68004-7.53499I$	0
$u=\ \ 0.502553+1.205120I$ $a=-0.54022+1.34157I$ $b=\ \ 0.296891-1.263300I$	$3.2751-14.0412I$	0
$u=\ \ 0.502553-1.205120I$ $a=-0.54022-1.34157I$ $b=\ \ 0.296891+1.263300I$	$3.2751+14.0412I$	0
$u=\ \ 1.254340+0.395241I$ $a=-0.195623+0.399096I$ $b=-1.139310+0.031343I$	$-6.53345-2.32464I$	0
$u=\ \ 1.254340-0.395241I$ $a=-0.195623-0.399096I$ $b=-1.139310-0.031343I$	$-6.53345+2.32464I$	0
$u=\ \ 0.563330+0.374444I$ $a=\ \ 0.367906+0.121104I$ $b=\ \ 0.392380-0.747287I$	$1.83771+4.15446I$	$-12.00000-4.45837I$
$u=\ \ 0.563330-0.374444I$ $a=\ \ 0.367906-0.121104I$ $b=\ \ 0.392380+0.747287I$	$1.83771-4.15446I$	$-12.00000+4.45837I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.035474+0.674379I$ $a=\ \ 0.73673-3.21244I$ $b=-0.727123+0.121587I$	$2.62009-3.15258I$	$-7.30516-1.86749I$
$u=-0.035474-0.674379I$ $a=\ \ 0.73673+3.21244I$ $b=-0.727123-0.121587I$	$2.62009+3.15258I$	$-7.30516+1.86749I$
$u=-1.292450+0.297044I$ $a=\ \ 0.140330-0.094987I$ $b=\ \ 1.147030+0.395623I$	$-0.03753-7.18574I$	0
$u=-1.292450-0.297044I$ $a=\ \ 0.140330+0.094987I$ $b=\ \ 1.147030-0.395623I$	$-0.03753+7.18574I$	0
$u=\ \ 0.493976+0.457694I$ $a=\ \ 0.253734-0.205322I$ $b=-0.197489+0.627814I$	$3.32569-0.65529I$	$-6.71791+2.75531I$
$u=\ \ 0.493976-0.457694I$ $a=\ \ 0.253734+0.205322I$ $b=-0.197489-0.627814I$	$3.32569+0.65529I$	$-6.71791-2.75531I$
$u=-0.420753+1.273170I$ $a=-0.198239-1.064800I$ $b=\ \ 0.285083+0.464077I$	$1.22970+5.73765I$	0
$u=-0.420753-1.273170I$ $a=-0.198239+1.064800I$ $b=\ \ 0.285083-0.464077I$	$1.22970-5.73765I$	0
$u=-0.408294+1.284780I$ $a=-0.992362+0.925617I$ $b=\ \ 0.929801+0.024442I$	$-1.31289+1.98120I$	0
$u=-0.408294-1.284780I$ $a=-0.992362-0.925617I$ $b=\ \ 0.929801-0.024442I$	$-1.31289-1.98120I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.318560+0.327432I$ $a=\ \ 0.0119743-0.1206620I$ $b=-1.189920-0.156849I$	$-7.50514-1.37117I$	0
$u=-1.318560-0.327432I$ $a=\ \ 0.0119743+0.1206620I$ $b=-1.189920+0.156849I$	$-7.50514+1.37117I$	0
$u=\ \ 0.083023+0.635682I$ $a=-0.03057+1.71932I$ $b=\ \ 1.089820-0.686141I$	-0.551162	$-4.22170+0.I$
$u=\ \ 0.083023-0.635682I$ $a=-0.03057-1.71932I$ $b=\ \ 1.089820+0.686141I$	-0.551162	$-4.22170+0.I$
$u=\ \ 0.461487+1.278340I$ $a=\ \ 0.633716-0.857699I$ $b=\ \ 0.736078+0.367160I$	$3.71261+4.93092I$	0
$u=\ \ 0.461487-1.278340I$ $a=\ \ 0.633716+0.857699I$ $b=\ \ 0.736078-0.367160I$	$3.71261-4.93092I$	0
$u=\ \ 0.635937+1.206620I$ $a=-0.141131+1.397990I$ $b=-1.228840-0.582408I$	$0.07161-9.29331I$	0
$u=\ \ 0.635937-1.206620I$ $a=-0.141131-1.397990I$ $b=-1.228840+0.582408I$	$0.07161+9.29331I$	0
$u=-0.402012+1.313960I$ $a=\ \ 0.692889+0.794692I$ $b=-0.484017-0.675496I$	$2.62009+3.15258I$	0
$u=-0.402012-1.313960I$ $a=\ \ 0.692889-0.794692I$ $b=-0.484017+0.675496I$	$2.62009-3.15258I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.675199 + 1.199990I$ $a = -0.083026 - 0.945417I$ $b = 1.315650 + 0.361753I$	$-3.91595 - 4.23228I$	0
$u = 0.675199 - 1.199990I$ $a = -0.083026 + 0.945417I$ $b = 1.315650 - 0.361753I$	$-3.91595 + 4.23228I$	0
$u = -0.559368 + 0.267785I$ $a = -0.612320 - 1.069500I$ $b = -1.248960 - 0.291886I$	$0.59207 - 3.84639I$	$-16.3412 + 6.1087I$
$u = -0.559368 - 0.267785I$ $a = -0.612320 + 1.069500I$ $b = -1.248960 + 0.291886I$	$0.59207 + 3.84639I$	$-16.3412 - 6.1087I$
$u = 0.640578 + 1.232330I$ $a = -0.08096 - 1.57782I$ $b = 1.35280 + 0.68528I$	$-3.5371 - 14.1696I$	0
$u = 0.640578 - 1.232330I$ $a = -0.08096 + 1.57782I$ $b = 1.35280 - 0.68528I$	$-3.5371 + 14.1696I$	0
$u = 0.487495 + 1.304020I$ $a = -0.208277 + 0.851270I$ $b = -0.985837 - 0.388487I$	$6.19587 - 1.47709I$	0
$u = 0.487495 - 1.304020I$ $a = -0.208277 - 0.851270I$ $b = -0.985837 + 0.388487I$	$6.19587 + 1.47709I$	0
$u = 0.500404 + 0.319118I$ $a = 1.03061 - 2.45334I$ $b = 0.805428 + 0.693717I$	$-2.72280 - 3.03687I$	$-18.8978 + 3.7986I$
$u = 0.500404 - 0.319118I$ $a = 1.03061 + 2.45334I$ $b = 0.805428 - 0.693717I$	$-2.72280 + 3.03687I$	$-18.8978 - 3.7986I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.57488 + 1.31082I$ $a = -0.24084 + 1.64866I$ $b = -1.059500 - 0.572660I$	$0.90150 - 8.00755I$	0
$u = 0.57488 - 1.31082I$ $a = -0.24084 - 1.64866I$ $b = -1.059500 + 0.572660I$	$0.90150 + 8.00755I$	0
$u = -0.513014 + 0.229311I$ $a = 0.627065 - 0.718822I$ $b = 1.230040 + 0.148177I$	$-1.02208 - 2.05598I$	$-15.0654 + 0.2508I$
$u = -0.513014 - 0.229311I$ $a = 0.627065 + 0.718822I$ $b = 1.230040 - 0.148177I$	$-1.02208 + 2.05598I$	$-15.0654 - 0.2508I$
$u = 0.441975 + 0.340142I$ $a = -0.958567 - 0.445390I$ $b = -1.311680 - 0.324396I$	$-3.68004 - 7.53499I$	$-17.8449 + 6.7090I$
$u = 0.441975 - 0.340142I$ $a = -0.958567 + 0.445390I$ $b = -1.311680 + 0.324396I$	$-3.68004 + 7.53499I$	$-17.8449 - 6.7090I$
$u = 0.18678 + 1.43477I$ $a = 1.10945 - 0.90922I$ $b = -0.667207 + 0.521091I$	$4.56771 - 4.91013I$	0
$u = 0.18678 - 1.43477I$ $a = 1.10945 + 0.90922I$ $b = -0.667207 - 0.521091I$	$4.56771 + 4.91013I$	0
$u = -0.79123 + 1.21455I$ $a = -0.19125 + 1.41279I$ $b = 1.158130 - 0.612879I$	$-3.73630 + 7.55536I$	0
$u = -0.79123 - 1.21455I$ $a = -0.19125 - 1.41279I$ $b = 1.158130 + 0.612879I$	$-3.73630 - 7.55536I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.69068+1.30818I$ $a=-0.342924+1.139810I$ $b=\ \ 1.34710-0.51490I$	$-4.26915+8.26207I$	0
$u=-0.69068-1.30818I$ $a=-0.342924-1.139810I$ $b=\ \ 1.34710+0.51490I$	$-4.26915-8.26207I$	0
$u=-0.68673+1.32005I$ $a=\ \ 0.064725-1.366140I$ $b=-1.28534+0.61833I$	$3.2751+14.0412I$	0
$u=-0.68673-1.32005I$ $a=\ \ 0.064725+1.366140I$ $b=-1.28534-0.61833I$	$3.2751-14.0412I$	0
$u=-0.464434+0.187179I$ $a=-2.09409-0.59676I$ $b=\ \ 0.113747+0.848755I$	$-2.45707-3.31723I$	$-16.2672+3.7814I$
$u=-0.464434-0.187179I$ $a=-2.09409+0.59676I$ $b=\ \ 0.113747-0.848755I$	$-2.45707+3.31723I$	$-16.2672-3.7814I$
$u=\ \ 0.00030+1.51994I$ $a=-0.687857+0.192593I$ $b=\ \ 0.808043-0.228187I$	$0.59207+3.84639I$	0
$u=\ \ 0.00030-1.51994I$ $a=-0.687857-0.192593I$ $b=\ \ 0.808043+0.228187I$	$0.59207-3.84639I$	0
$u=\ \ 0.034618+0.409937I$ $a=-2.11467-0.07409I$ $b=-1.364660-0.266765I$	$-3.73630-7.55536I$	$-20.7272+3.7806I$
$u=\ \ 0.034618-0.409937I$ $a=-2.11467+0.07409I$ $b=-1.364660+0.266765I$	$-3.73630+7.55536I$	$-20.7272-3.7806I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.60159 + 0.07335I$ $a = -0.402181 - 0.379049I$ $b = -0.945404 + 0.203727I$	$-5.99442 + 2.26352I$	0
$u = 1.60159 - 0.07335I$ $a = -0.402181 + 0.379049I$ $b = -0.945404 - 0.203727I$	$-5.99442 - 2.26352I$	0
$u = 0.68463 + 1.47823I$ $a = -0.136931 - 1.359930I$ $b = 1.121570 + 0.483815I$	$-1.21344 - 9.83163I$	0
$u = 0.68463 - 1.47823I$ $a = -0.136931 + 1.359930I$ $b = 1.121570 - 0.483815I$	$-1.21344 + 9.83163I$	0
$u = -1.63060 + 0.48529I$ $a = -0.111402 + 0.347942I$ $b = -1.020230 - 0.272083I$	$-6.45947 + 0.53044I$	0
$u = -1.63060 - 0.48529I$ $a = -0.111402 - 0.347942I$ $b = -1.020230 + 0.272083I$	$-6.45947 - 0.53044I$	0
$u = -0.23104 + 1.72150I$ $a = -0.558279 - 0.316774I$ $b = 0.914287 + 0.325735I$	$3.21020 - 7.96938I$	0
$u = -0.23104 - 1.72150I$ $a = -0.558279 + 0.316774I$ $b = 0.914287 - 0.325735I$	$3.21020 + 7.96938I$	0
$u = -0.15583 + 1.82679I$ $a = 0.370491 + 0.090013I$ $b = -0.778719 - 0.119365I$	$7.63312 - 0.89997I$	0
$u = -0.15583 - 1.82679I$ $a = 0.370491 - 0.090013I$ $b = -0.778719 + 0.119365I$	$7.63312 + 0.89997I$	0

III. $I_3^u = \langle u^5+u^4+2u^3+u^2+2b+u-1,\ -u^5-u^4-2u^3+u^2+2a-u+3,\ u^6+3u^4-u^3+2u^2-2u-1\rangle$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{2}u^5+\frac{1}{2}u^4+\cdots+\frac{1}{2}u-\frac{3}{2} \\ -\frac{1}{2}u^5-\frac{1}{2}u^4+\cdots-\frac{1}{2}u+\frac{1}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^2-1 \\ -\frac{1}{2}u^5-\frac{1}{2}u^4+\cdots-\frac{1}{2}u+\frac{1}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3+u \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -u^5+u^4-2u^3+2u^2-2u \\ -u^4-2u^2+u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^5+2u^4+2u^3+u^2-1 \\ -u^5-u^4+3u+1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{3}{2}u^5+\frac{1}{2}u^4+\cdots-\frac{1}{2}u-\frac{1}{2} \\ -\frac{1}{2}u^5+\frac{1}{2}u^4+\cdots+\frac{1}{2}u+\frac{1}{2} \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} \frac{5}{4}u^5+\frac{3}{4}u^4+\cdots-\frac{1}{4}u-\frac{5}{4} \\ -\frac{5}{4}u^5+\frac{1}{4}u^4+\cdots+\frac{1}{4}u+\frac{1}{4} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{339}{64}u^5-\frac{203}{64}u^4+\frac{127}{16}u^3-\frac{815}{64}u^2-\frac{19}{64}u-\frac{1051}{64}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^6 - u^5 - 2u^4 + u^3 + 15u^2 + 3u - 13$
c_2, c_{11}	$2(2u^6 - u^5 - 5u^4 + 3u^3 + 4u^2 - u - 1)$
c_3, c_5	$2(2u^6 + u^5 - 5u^4 - 3u^3 + 4u^2 + u - 1)$
c_4, c_7	$u^6 + 3u^4 + u^3 + 2u^2 + 2u - 1$
c_6, c_8	$u^6 + 2u^5 + 3u^4 - 8u^2 - 3u + 4$
c_9, c_{12}	$u^6 + 3u^4 - u^3 + 2u^2 - 2u - 1$
c_{10}	$4(4u^6 + 9u^5 + 10u^4 + 5u^3 + 4u^2 + 4u + 1)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^6 - 5y^5 + 36y^4 - 81y^3 + 271y^2 - 399y + 169$
c_2, c_3, c_5 c_{11}	$4(4y^6 - 21y^5 + 47y^4 - 55y^3 + 32y^2 - 9y + 1)$
c_4, c_7, c_9 c_{12}	$y^6 + 6y^5 + 13y^4 + 9y^3 - 6y^2 - 8y + 1$
c_6, c_8	$y^6 + 2y^5 - 7y^4 - 28y^3 + 88y^2 - 73y + 16$
c_{10}	$16(16y^6 - y^5 + 42y^4 - 9y^3 - 4y^2 - 8y + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.841864$ $a = -0.374188$ $b = -1.33455$	-8.17258	-20.3140
$u = \ \ 0.126468 + 1.352400I$ $a = \ \ 1.40195 - 0.45857I$ $b = -0.588959 + 0.116497I$	$6.71880 - 3.39374I$	$2.08996 + 1.93495I$
$u = \ \ 0.126468 - 1.352400I$ $a = \ \ 1.40195 + 0.45857I$ $b = -0.588959 - 0.116497I$	$6.71880 + 3.39374I$	$2.08996 - 1.93495I$
$u = -0.376468 + 1.319680I$ $a = -0.58244 + 1.44801I$ $b = \ \ 1.182250 - 0.454374I$	$0.12319 + 8.77346I$	$-11.09361 - 6.96195I$
$u = -0.376468 - 1.319680I$ $a = -0.58244 - 1.44801I$ $b = \ \ 1.182250 + 0.454374I$	$0.12319 - 8.77346I$	$-11.09361 + 6.96195I$
$u = -0.341865$ $a = -1.76483$ $b = \ \ 0.647956$	-2.22153	-18.1940

IV.

$\boldsymbol{I_4^u = \langle 4.40\times 10^{51}u^{45}-8.44\times 10^{51}u^{44}+\cdots+5.41\times 10^{50}b-4.27\times 10^{52},\ -3.42\times 10^{52}u^{45}+1.28\times 10^{52}u^{44}+\cdots+1.08\times 10^{51}a-1.08\times 10^{53},\ u^{46}-u^{45}+\cdots+12u+4\rangle}$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 31.6285u^{45} - 11.8715u^{44} + \cdots + 537.388u + 100.225 \\ -8.13729u^{45} + 15.5907u^{44} + \cdots + 195.982u + 78.9260 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 23.4912u^{45} + 3.71922u^{44} + \cdots + 733.369u + 179.151 \\ -8.13729u^{45} + 15.5907u^{44} + \cdots + 195.982u + 78.9260 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 29.5760u^{45} - 13.3326u^{44} + \cdots + 617.752u + 113.976 \\ -9.64980u^{45} + 27.5793u^{44} + \cdots + 434.033u + 155.556 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 45.4243u^{45} - 62.3283u^{44} + \cdots - 212.470u - 191.008 \\ 22.9703u^{45} - 28.5063u^{44} + \cdots - 85.6937u - 90.0526 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -13.3814u^{45} + 58.4735u^{44} + \cdots + 1038.19u + 356.014 \\ -4.41878u^{45} + 18.7774u^{44} + \cdots + 358.045u + 128.384 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 19.7640u^{45} - 45.5939u^{44} + \cdots - 702.479u - 251.614 \\ -10.7564u^{45} - 8.87510u^{44} + \cdots - 570.703u - 148.811 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 44.5405u^{45} - 31.1466u^{44} + \cdots + 598.656u + 71.7825 \\ -2.97301u^{45} + 17.7030u^{44} + \cdots + 389.272u + 124.760 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -21.8041u^{45} + 27.9798u^{44} + \cdots - 44.9663u + 49.2717 \\ -34.9052u^{45} + 30.0647u^{44} + \cdots - 292.715u + 1.25918 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 9.48329u^{45} - 53.2188u^{44} + \cdots - 1217.89u - 404.995$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{23} - 3u^{22} + \cdots + 151u - 25)^2$
c_2, c_{11}	$u^{46} + 5u^{45} + \cdots - 4u + 1$
c_3, c_5	$u^{46} - 5u^{45} + \cdots + 4u + 1$
c_4, c_7	$u^{46} + u^{45} + \cdots - 12u + 4$
c_6, c_8	$u^{46} - 6u^{45} + \cdots - 99u + 11$
c_9, c_{12}	$u^{46} - u^{45} + \cdots + 12u + 4$
c_{10}	$(u^{23} + 5u^{22} + \cdots + 2u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{23}+9y^{22}+\cdots-5799y-625)^2$
c_2, c_3, c_5 c_{11}	$y^{46}-27y^{45}+\cdots-40y+1$
c_4, c_7, c_9 c_{12}	$y^{46}+25y^{45}+\cdots+416y+16$
c_6, c_8	$y^{46}-24y^{45}+\cdots-5995y+121$
c_{10}	$(y^{23}-45y^{22}+\cdots-14y-1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.131845 + 0.978857I$ $a = 0.67246 - 1.82940I$ $b = -0.15795 + 1.43214I$	$7.82326 - 0.53653I$	$-4.13730 - 5.24725I$
$u = 0.131845 - 0.978857I$ $a = 0.67246 + 1.82940I$ $b = -0.15795 - 1.43214I$	$7.82326 + 0.53653I$	$-4.13730 + 5.24725I$
$u = 0.896198 + 0.476953I$ $a = 0.870986 - 0.150250I$ $b = 0.881003 - 0.361673I$	$-1.84009 + 3.24020I$	$-9.52863 - 6.89276I$
$u = 0.896198 - 0.476953I$ $a = 0.870986 + 0.150250I$ $b = 0.881003 + 0.361673I$	$-1.84009 - 3.24020I$	$-9.52863 + 6.89276I$
$u = 0.357790 + 0.912103I$ $a = -0.23483 - 1.80763I$ $b = 1.48597 + 0.04181I$	$-5.77540 - 2.30938I$	$3.60017 + 10.56143I$
$u = 0.357790 - 0.912103I$ $a = -0.23483 + 1.80763I$ $b = 1.48597 - 0.04181I$	$-5.77540 + 2.30938I$	$3.60017 - 10.56143I$
$u = 0.175393 + 1.057290I$ $a = 1.44993 + 2.26567I$ $b = -1.64967 - 1.92523I$	2.33184	$-249.889 + 0.I$
$u = 0.175393 - 1.057290I$ $a = 1.44993 - 2.26567I$ $b = -1.64967 + 1.92523I$	2.33184	$-249.889 + 0.I$
$u = -0.314974 + 0.856411I$ $a = -0.29088 - 3.34048I$ $b = -0.668525 + 0.261913I$	$0.95192 + 8.74138I$	$-12.5922 - 12.9338I$
$u = -0.314974 - 0.856411I$ $a = -0.29088 + 3.34048I$ $b = -0.668525 - 0.261913I$	$0.95192 - 8.74138I$	$-12.5922 + 12.9338I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.245397 + 0.814683I$ $a = -0.57924 + 1.78892I$ $b = -1.51112 - 0.12500I$	$-6.31804 - 0.41537I$	$0.5403 - 14.4576I$
$u = 0.245397 - 0.814683I$ $a = -0.57924 - 1.78892I$ $b = -1.51112 + 0.12500I$	$-6.31804 + 0.41537I$	$0.5403 + 14.4576I$
$u = -0.304618 + 1.155010I$ $a = 0.562109 - 1.008460I$ $b = -0.125668 + 0.675542I$	$0.57175 + 2.34177I$	0
$u = -0.304618 - 1.155010I$ $a = 0.562109 + 1.008460I$ $b = -0.125668 - 0.675542I$	$0.57175 - 2.34177I$	0
$u = -0.364563 + 1.148240I$ $a = -0.22605 - 1.79969I$ $b = -1.228100 + 0.504496I$	$3.49555 + 6.29451I$	0
$u = -0.364563 - 1.148240I$ $a = -0.22605 + 1.79969I$ $b = -1.228100 - 0.504496I$	$3.49555 - 6.29451I$	0
$u = -0.459751 + 0.626740I$ $a = 1.56966 + 2.06593I$ $b = 0.815623 - 0.193608I$	$2.21969 + 4.00523I$	$-12.62158 - 5.18160I$
$u = -0.459751 - 0.626740I$ $a = 1.56966 - 2.06593I$ $b = 0.815623 + 0.193608I$	$2.21969 - 4.00523I$	$-12.62158 + 5.18160I$
$u = 0.463220 + 0.603361I$ $a = -0.756411 + 0.424958I$ $b = 1.157190 - 0.305670I$	$0.57175 - 2.34177I$	$-11.22455 + 2.79967I$
$u = 0.463220 - 0.603361I$ $a = -0.756411 - 0.424958I$ $b = 1.157190 + 0.305670I$	$0.57175 + 2.34177I$	$-11.22455 - 2.79967I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.081360 + 0.735029I$ $a = 0.81812 + 3.30002I$ $b = -0.580140 - 0.643427I$	$-1.84009 - 3.24020I$	$-9.52863 + 6.89276I$
$u = 0.081360 - 0.735029I$ $a = 0.81812 - 3.30002I$ $b = -0.580140 + 0.643427I$	$-1.84009 + 3.24020I$	$-9.52863 - 6.89276I$
$u = 0.049943 + 0.694222I$ $a = -0.453160 - 0.308938I$ $b = -1.48075 - 0.20224I$	$-3.23627 - 7.73169I$	$-6.25642 + 7.41688I$
$u = 0.049943 - 0.694222I$ $a = -0.453160 + 0.308938I$ $b = -1.48075 + 0.20224I$	$-3.23627 + 7.73169I$	$-6.25642 - 7.41688I$
$u = -0.406323 + 1.269900I$ $a = 0.808009 + 0.646630I$ $b = -0.592483 - 0.684078I$	$2.21969 + 4.00523I$	0
$u = -0.406323 - 1.269900I$ $a = 0.808009 - 0.646630I$ $b = -0.592483 + 0.684078I$	$2.21969 - 4.00523I$	0
$u = -0.654251 + 0.013991I$ $a = -0.186552 - 0.036628I$ $b = 0.842704 - 0.393872I$	$-1.82461 - 0.02654I$	$-14.7661 + 0.5460I$
$u = -0.654251 - 0.013991I$ $a = -0.186552 + 0.036628I$ $b = 0.842704 + 0.393872I$	$-1.82461 + 0.02654I$	$-14.7661 - 0.5460I$
$u = -0.143948 + 1.353480I$ $a = 0.070610 - 0.184025I$ $b = 0.312840 - 0.106831I$	$1.12137 + 3.21807I$	0
$u = -0.143948 - 1.353480I$ $a = 0.070610 + 0.184025I$ $b = 0.312840 + 0.106831I$	$1.12137 - 3.21807I$	0

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.601361 + 1.273960I$ $a = -0.36765 + 1.58478I$ $b = -1.015330 - 0.548591I$	$0.95192 - 8.74138I$	0
$u = 0.601361 - 1.273960I$ $a = -0.36765 - 1.58478I$ $b = -1.015330 + 0.548591I$	$0.95192 + 8.74138I$	0
$u = -0.369655 + 0.401631I$ $a = 0.57718 + 1.92042I$ $b = 1.068430 + 0.193875I$	$1.12137 - 3.21807I$	$-10.70427 - 0.14049I$
$u = -0.369655 - 0.401631I$ $a = 0.57718 - 1.92042I$ $b = 1.068430 - 0.193875I$	$1.12137 + 3.21807I$	$-10.70427 + 0.14049I$
$u = -0.076941 + 0.527831I$ $a = -0.11008 - 2.98398I$ $b = 0.710838 + 0.441013I$	$-1.82461 - 0.02654I$	$-14.7661 + 0.5460I$
$u = -0.076941 - 0.527831I$ $a = -0.11008 + 2.98398I$ $b = 0.710838 - 0.441013I$	$-1.82461 + 0.02654I$	$-14.7661 - 0.5460I$
$u = -0.09756 + 1.47144I$ $a = -0.161127 + 0.881883I$ $b = 0.611162 - 0.036365I$	$3.49555 - 6.29451I$	0
$u = -0.09756 - 1.47144I$ $a = -0.161127 - 0.881883I$ $b = 0.611162 + 0.036365I$	$3.49555 + 6.29451I$	0
$u = 0.79501 + 1.30236I$ $a = -0.223692 - 1.289510I$ $b = 1.188870 + 0.590006I$	$-3.23627 - 7.73169I$	0
$u = 0.79501 - 1.30236I$ $a = -0.223692 + 1.289510I$ $b = 1.188870 - 0.590006I$	$-3.23627 + 7.73169I$	0

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.67530+0.03765I$ $a=-0.383637+0.298946I$ $b=-0.897619-0.190346I$	$-5.77540-2.30938I$	0
$u=-1.67530-0.03765I$ $a=-0.383637-0.298946I$ $b=-0.897619+0.190346I$	$-5.77540+2.30938I$	0
$u=\ \ 1.66358+0.48122I$ $a=-0.123714-0.283288I$ $b=-1.005550+0.269722I$	$-6.31804-0.41537I$	0
$u=\ \ 1.66358-0.48122I$ $a=-0.123714+0.283288I$ $b=-1.005550-0.269722I$	$-6.31804+0.41537I$	0
$u=-0.09321+1.75383I$ $a=\ \ 0.197963-0.174427I$ $b=-0.661737+0.007795I$	$7.82326-0.53653I$	0
$u=-0.09321-1.75383I$ $a=\ \ 0.197963+0.174427I$ $b=-0.661737-0.007795I$	$7.82326+0.53653I$	0

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^6-u^5+\cdots+3u-13)(u^{23}-3u^{22}+\cdots+151u-25)^2$ $\cdot(u^{31}-10u^{30}+\cdots+3180u+792)(u^{75}+u^{74}+\cdots-8855u+8613)^2$
c_2, c_{11}	$4(2u^6-u^5+\cdots-u-1)(2u^{31}+u^{30}+\cdots+6u+1)$ $\cdot(u^{46}+5u^{45}+\cdots-4u+1)(u^{150}+2u^{149}+\cdots+1677010u+170479)$
c_3, c_5	$4(2u^6+u^5+\cdots+u-1)(2u^{31}+u^{30}+\cdots+6u+1)$ $\cdot(u^{46}-5u^{45}+\cdots+4u+1)(u^{150}+2u^{149}+\cdots+1677010u+170479)$
c_4, c_7	$(u^6+3u^4+u^3+2u^2+2u-1)(u^{31}+11u^{29}+\cdots+12u+4)$ $\cdot(u^{46}+u^{45}+\cdots-12u+4)(u^{150}+2u^{149}+\cdots-2018u+919)$
c_6, c_8	$(u^6+2u^5+3u^4-8u^2-3u+4)(u^{31}-2u^{30}+\cdots+17u+4)$ $\cdot(u^{46}-6u^{45}+\cdots-99u+11)(u^{150}-11u^{149}+\cdots-497109u+23211)$
c_9, c_{12}	$(u^6+3u^4-u^3+2u^2-2u-1)(u^{31}+11u^{29}+\cdots+12u+4)$ $\cdot(u^{46}-u^{45}+\cdots+12u+4)(u^{150}+2u^{149}+\cdots-2018u+919)$
c_{10}	$16(4u^6+9u^5+10u^4+5u^3+4u^2+4u+1)$ $\cdot((u^{23}+5u^{22}+\cdots+2u+1)^2)(4u^{31}+67u^{30}+\cdots+1040u+104)$ $\cdot(u^{75}-14u^{74}+\cdots+3u-1)^2$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^6-5y^5+36y^4-81y^3+271y^2-399y+169)$ $\cdot(y^{23}+9y^{22}+\cdots-5799y-625)^2$ $\cdot(y^{31}+2y^{30}+\cdots+13128336y-627264)$ $\cdot(y^{75}-5y^{74}+\cdots-714208913y-74183769)^2$
c_2, c_3, c_5 c_{11}	$16(4y^6-21y^5+47y^4-55y^3+32y^2-9y+1)$ $\cdot(4y^{31}-61y^{30}+\cdots+20y-1)(y^{46}-27y^{45}+\cdots-40y+1)$ $\cdot(y^{150}-90y^{149}+\cdots-927470682466y+29063089441)$
c_4, c_7, c_9 c_{12}	$(y^6+6y^5+\cdots-8y+1)(y^{31}+22y^{30}+\cdots+96y-16)$ $\cdot(y^{46}+25y^{45}+\cdots+416y+16)$ $\cdot(y^{150}+80y^{149}+\cdots+32014968y+844561)$
c_6, c_8	$(y^6+2y^5-7y^4-28y^3+88y^2-73y+16)$ $\cdot(y^{31}+14y^{30}+\cdots+105y-16)(y^{46}-24y^{45}+\cdots-5995y+121)$ $\cdot(y^{150}-25y^{149}+\cdots-6938889327y+538750521)$
c_{10}	$256(16y^6-y^5+42y^4-9y^3-4y^2-8y+1)$ $\cdot(y^{23}-45y^{22}+\cdots-14y-1)^2$ $\cdot(16y^{31}-49y^{30}+\cdots+106912y-10816)$ $\cdot(y^{75}-40y^{74}+\cdots-283y-1)^2$