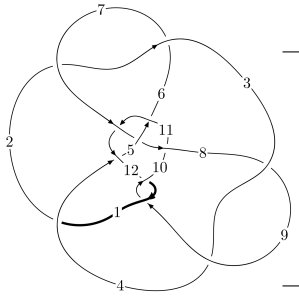
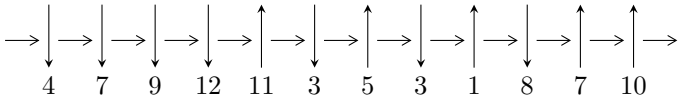
## $12n_{0784}$ $(K12n_{0784})$




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$\begin{aligned} I_1^u = \langle & -3.76991 \times 10^{683} u^{96} - 1.11129 \times 10^{684} u^{95} + \cdots + 2.93219 \times 10^{689} b - 1.43801 \times 10^{689}, \\ & - 3.81255 \times 10^{687} u^{96} - 1.08815 \times 10^{688} u^{95} + \cdots + 3.67491 \times 10^{692} a - 3.18684 \times 10^{693}, \\ & u^{97} + 3u^{96} + \cdots - 326815u + 423614 \rangle \\ I_2^u = \langle & -2.33693 \times 10^{55} u^{35} - 1.33989 \times 10^{54} u^{34} + \cdots + 2.94617 \times 10^{55} b + 8.02253 \times 10^{54}, \\ & - 7.16188 \times 10^{55} u^{35} - 1.46151 \times 10^{55} u^{34} + \cdots + 2.94617 \times 10^{55} a + 9.34411 \times 10^{55}, \ u^{36} - 7u^{34} + \cdots - 2u - \end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 133 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.** $\boldsymbol{I_1^u = \langle -3.77 \times 10^{683} u^{96} - 1.11 \times 10^{684} u^{95} + \cdots + 2.93 \times 10^{689} b - 1.44 \times 10^{689},\ -3.81 \times 10^{687} u^{96} - 1.09 \times 10^{688} u^{95} + \cdots + 3.67 \times 10^{692} a - 3.19 \times 10^{693},\ u^{97} + 3u^{96} + \cdots - 326815u + 423614 \rangle}$

**(i) Arc colorings**

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.0000103746u^{96} + 0.0000296103u^{95} + \cdots - 5.13025u + 8.67190 \\ 1.28570 \times 10^{-6} u^{96} + 3.78995 \times 10^{-6} u^{95} + \cdots + 1.97339u + 0.490420 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.0000103746u^{96} + 0.0000296103u^{95} + \cdots - 5.13025u + 8.67190 \\ 3.02293 \times 10^{-6} u^{96} + 7.99155 \times 10^{-6} u^{95} + \cdots + 6.86279u - 0.150671 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 7.84420 \times 10^{-6} u^{96} + 0.0000208910u^{95} + \cdots + 12.2774u + 1.57910 \\ 4.97744 \times 10^{-8} u^{96} + 8.34988 \times 10^{-8} u^{95} + \cdots + 0.288331u + 0.473383 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 7.79443 \times 10^{-6} u^{96} + 0.0000208075u^{95} + \cdots + 11.9891u + 1.10572 \\ 4.97744 \times 10^{-8} u^{96} + 8.34988 \times 10^{-8} u^{95} + \cdots + 0.288331u + 0.473383 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.0000204260u^{96} - 0.0000572511u^{95} + \cdots - 27.5893u - 6.39711 \\ 1.61577 \times 10^{-6} u^{96} + 4.87046 \times 10^{-6} u^{95} + \cdots + 2.05769u + 1.46957 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -9.88886 \times 10^{-6} u^{96} - 0.0000265271u^{95} + \cdots - 21.3728u + 0.115127 \\ -9.04866 \times 10^{-7} u^{96} - 2.45873 \times 10^{-6} u^{95} + \cdots - 0.780709u + 0.557878 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 6.73434 \times 10^{-6} u^{96} + 0.0000187268u^{95} + \cdots + 8.13376u + 2.67026 \\ 7.03433 \times 10^{-8} u^{96} + 2.51508 \times 10^{-7} u^{95} + \cdots - 0.520092u + 0.939174 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 3.07647 \times 10^{-6} u^{96} + 7.59451 \times 10^{-6} u^{95} + \cdots + 12.1478u - 2.13295 \\ -2.32077 \times 10^{-6} u^{96} - 6.97629 \times 10^{-6} u^{95} + \cdots - 2.64506u - 0.636660 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 4.36241 \times 10^{-6} u^{96} + 0.0000116402u^{95} + \cdots + 12.3313u + 0.259494 \\ 3.20577 \times 10^{-8} u^{96} + 2.63754 \times 10^{-7} u^{95} + \cdots + 0.735310u + 0.204890 \end{pmatrix}$$

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes** $= 0.0000318183u^{96} + 0.0000744702u^{95} + \cdots + 139.903u - 26.7053$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{97} - 6u^{96} + \cdots + 11484641u + 1234962$ |
| $c_2, c_6$ | $u^{97} + 3u^{96} + \cdots + 38u - 1$ |
| $c_3, c_8$ | $u^{97} - u^{96} + \cdots - 45431u + 10369$ |
| $c_4$ | $u^{97} + 3u^{96} + \cdots - 524325u + 114823$ |
| $c_5$ | $u^{97} + u^{96} + \cdots + 4369766u - 1681359$ |
| $c_7$ | $u^{97} + 9u^{96} + \cdots + 6u + 1$ |
| $c_9, c_{12}$ | $u^{97} - 4u^{96} + \cdots + 858u + 53$ |
| $c_{10}$ | $u^{97} - 9u^{96} + \cdots - 766766u + 291457$ |
| $c_{11}$ | $u^{97} - 3u^{96} + \cdots - 326815u - 423614$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{97} - 56y^{96} + \cdots + 104656278490069y - 1525131141444$ |
| $c_2, c_6$ | $y^{97} - 87y^{96} + \cdots + 162y - 1$ |
| $c_3, c_8$ | $y^{97} - 99y^{96} + \cdots + 13533582897y - 107516161$ |
| $c_4$ | $y^{97} - 7y^{96} + \cdots - 204662681307y - 13184321329$ |
| $c_5$ | $y^{97} + 33y^{96} + \cdots - 52295137112108y - 2826968086881$ |
| $c_7$ | $y^{97} - 23y^{96} + \cdots + 72y - 1$ |
| $c_9, c_{12}$ | $y^{97} + 64y^{96} + \cdots + 894104y - 2809$ |
| $c_{10}$ | $y^{97} - 45y^{96} + \cdots + 2453858214746y - 84947182849$ |
| $c_{11}$ | $y^{97} + 25y^{96} + \cdots - 3682305657223y - 179448820996$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.923522 + 0.419939I$<br>$a = -0.141190 - 0.711239I$<br>$b = -0.213610 + 0.164942I$ | $1.63907 + 6.49597I$ | 0 |
| $u = 0.923522 - 0.419939I$<br>$a = -0.141190 + 0.711239I$<br>$b = -0.213610 - 0.164942I$ | $1.63907 - 6.49597I$ | 0 |
| $u = -0.862563 + 0.538663I$<br>$a = 0.487071 - 0.589429I$<br>$b = -0.034290 + 0.213039I$ | $2.83107 - 2.04200I$ | 0 |
| $u = -0.862563 - 0.538663I$<br>$a = 0.487071 + 0.589429I$<br>$b = -0.034290 - 0.213039I$ | $2.83107 + 2.04200I$ | 0 |
| $u = -0.940702 + 0.267807I$<br>$a = 0.358836 - 0.095616I$<br>$b = -0.489850 + 0.448270I$ | $1.59879 - 0.37419I$ | 0 |
| $u = -0.940702 - 0.267807I$<br>$a = 0.358836 + 0.095616I$<br>$b = -0.489850 - 0.448270I$ | $1.59879 + 0.37419I$ | 0 |
| $u = 0.647383 + 0.723678I$<br>$a = -0.307654 - 0.408777I$<br>$b = 0.488257 + 0.100321I$ | $-2.76377 + 2.06605I$ | 0 |
| $u = 0.647383 - 0.723678I$<br>$a = -0.307654 + 0.408777I$<br>$b = 0.488257 - 0.100321I$ | $-2.76377 - 2.06605I$ | 0 |
| $u = -0.640499 + 0.727294I$<br>$a = -0.810670 - 0.913479I$<br>$b = -0.65070 - 1.54938I$ | $-3.99650 - 2.93403I$ | 0 |
| $u = -0.640499 - 0.727294I$<br>$a = -0.810670 + 0.913479I$<br>$b = -0.65070 + 1.54938I$ | $-3.99650 + 2.93403I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.574971 + 0.879011I$<br>$a = -0.706880 + 1.199510I$<br>$b = 0.59602 + 1.67422I$ | $-4.82694 + 4.90372I$ | 0 |
| $u = 0.574971 - 0.879011I$<br>$a = -0.706880 - 1.199510I$<br>$b = 0.59602 - 1.67422I$ | $-4.82694 - 4.90372I$ | 0 |
| $u = -0.923843 + 0.563679I$<br>$a = -0.042756 - 0.154213I$<br>$b = 1.18616 - 0.87947I$ | $-5.75571 - 6.53782I$ | 0 |
| $u = -0.923843 - 0.563679I$<br>$a = -0.042756 + 0.154213I$<br>$b = 1.18616 + 0.87947I$ | $-5.75571 + 6.53782I$ | 0 |
| $u = 0.116869 + 1.092610I$<br>$a = -0.17809 + 1.48324I$<br>$b = -0.57730 + 1.81085I$ | $-12.5963 - 6.5769I$ | 0 |
| $u = 0.116869 - 1.092610I$<br>$a = -0.17809 - 1.48324I$<br>$b = -0.57730 - 1.81085I$ | $-12.5963 + 6.5769I$ | 0 |
| $u = -0.125613 + 0.891330I$<br>$a = -0.0640181 + 0.0757123I$<br>$b = 2.59653 + 0.53168I$ | $-2.89330 + 7.74015I$ | $-15.9250 - 4.6761I$ |
| $u = -0.125613 - 0.891330I$<br>$a = -0.0640181 - 0.0757123I$<br>$b = 2.59653 - 0.53168I$ | $-2.89330 - 7.74015I$ | $-15.9250 + 4.6761I$ |
| $u = 0.415341 + 1.062690I$<br>$a = 0.609307 - 1.263920I$<br>$b = -0.39602 - 1.44832I$ | $-4.29659 + 2.89746I$ | 0 |
| $u = 0.415341 - 1.062690I$<br>$a = 0.609307 + 1.263920I$<br>$b = -0.39602 + 1.44832I$ | $-4.29659 - 2.89746I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.006624+0.851226I$<br>$a=-0.28218-1.60423I$<br>$b=\ \ 0.41444-1.42814I$ | $-2.89748+0.28298I$ | $-2.00000-1.27836I$ |
| $u=-0.006624-0.851226I$<br>$a=-0.28218+1.60423I$<br>$b=\ \ 0.41444+1.42814I$ | $-2.89748-0.28298I$ | $-2.00000+1.27836I$ |
| $u=\ \ 0.602528+0.597332I$<br>$a=-1.017100+0.021901I$<br>$b=\ \ 0.844467+0.976107I$ | $-0.58135-4.78436I$ | $-7.16761+8.69455I$ |
| $u=\ \ 0.602528-0.597332I$<br>$a=-1.017100-0.021901I$<br>$b=\ \ 0.844467-0.976107I$ | $-0.58135+4.78436I$ | $-7.16761-8.69455I$ |
| $u=-0.398228+1.092810I$<br>$a=-1.077510+0.417394I$<br>$b=-0.0958419-0.0506402I$ | $-8.13927+2.05497I$ | 0 |
| $u=-0.398228-1.092810I$<br>$a=-1.077510-0.417394I$<br>$b=-0.0958419+0.0506402I$ | $-8.13927-2.05497I$ | 0 |
| $u=\ \ 1.156450+0.156568I$<br>$a=\ \ 0.278185-0.941968I$<br>$b=-0.09792-2.37813I$ | $1.77212+4.10712I$ | 0 |
| $u=\ \ 1.156450-0.156568I$<br>$a=\ \ 0.278185+0.941968I$<br>$b=-0.09792+2.37813I$ | $1.77212-4.10712I$ | 0 |
| $u=\ \ 1.105100+0.379840I$<br>$a=-0.182877-0.225699I$<br>$b=-0.022022-0.775036I$ | $-0.18199+3.83962I$ | 0 |
| $u=\ \ 1.105100-0.379840I$<br>$a=-0.182877+0.225699I$<br>$b=-0.022022+0.775036I$ | $-0.18199-3.83962I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.066796+0.797343I$<br>$a=\ \ 0.0190218+0.1360920I$<br>$b=-1.86362+1.01515I$ | $2.50193-2.22011I$ | $-4.88704+9.89983I$ |
| $u=-0.066796-0.797343I$<br>$a=\ \ 0.0190218-0.1360920I$<br>$b=-1.86362-1.01515I$ | $2.50193+2.22011I$ | $-4.88704-9.89983I$ |
| $u=\ \ 1.182660+0.204302I$<br>$a=-0.257969-0.155904I$<br>$b=\ \ 0.230698-0.885742I$ | $-0.14085+3.92471I$ | 0 |
| $u=\ \ 1.182660-0.204302I$<br>$a=-0.257969+0.155904I$<br>$b=\ \ 0.230698+0.885742I$ | $-0.14085-3.92471I$ | 0 |
| $u=\ \ 0.579912+1.053320I$<br>$a=-0.05703+1.48597I$<br>$b=\ \ 0.02168+1.42488I$ | $-12.5183+9.8935I$ | 0 |
| $u=\ \ 0.579912-1.053320I$<br>$a=-0.05703-1.48597I$<br>$b=\ \ 0.02168-1.42488I$ | $-12.5183-9.8935I$ | 0 |
| $u=\ \ 0.795290+0.028539I$<br>$a=\ \ 1.122040+0.246087I$<br>$b=\ \ 0.633574+0.435374I$ | $-0.836585+0.106654I$ | $-8.30547-5.66017I$ |
| $u=\ \ 0.795290-0.028539I$<br>$a=\ \ 1.122040-0.246087I$<br>$b=\ \ 0.633574-0.435374I$ | $-0.836585-0.106654I$ | $-8.30547+5.66017I$ |
| $u=-1.21270$<br>$a=\ \ 1.38716$<br>$b=\ \ 0.991209$ | $-3.84308$ | 0 |
| $u=\ \ 0.281235+0.719483I$<br>$a=\ \ 0.028419+0.260896I$<br>$b=\ \ 1.091930+0.404289I$ | $0.03454-3.03484I$ | $-2.77691+0.64392I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.281235 - 0.719483I$<br>$a = 0.028419 - 0.260896I$<br>$b = 1.091930 - 0.404289I$ | $0.03454 + 3.03484I$ | $-2.77691 - 0.64392I$ |
| $u = 1.141950 + 0.454769I$<br>$a = -1.221940 + 0.431608I$<br>$b = -0.873299 + 0.669264I$ | $-8.50791 + 7.03123I$ | 0 |
| $u = 1.141950 - 0.454769I$<br>$a = -1.221940 - 0.431608I$<br>$b = -0.873299 - 0.669264I$ | $-8.50791 - 7.03123I$ | 0 |
| $u = -0.378164 + 1.200280I$<br>$a = 0.011811 - 1.286790I$<br>$b = -0.310358 - 1.324910I$ | $-6.56438 - 2.28949I$ | 0 |
| $u = -0.378164 - 1.200280I$<br>$a = 0.011811 + 1.286790I$<br>$b = -0.310358 + 1.324910I$ | $-6.56438 + 2.28949I$ | 0 |
| $u = 0.028117 + 0.736591I$<br>$a = -0.08855 + 2.18812I$<br>$b = 0.25582 + 1.90745I$ | $-5.81101 + 3.05040I$ | $-1.70242 - 4.94793I$ |
| $u = 0.028117 - 0.736591I$<br>$a = -0.08855 - 2.18812I$<br>$b = 0.25582 - 1.90745I$ | $-5.81101 - 3.05040I$ | $-1.70242 + 4.94793I$ |
| $u = -0.425850 + 1.198780I$<br>$a = -0.104106 + 1.361580I$<br>$b = 0.04697 + 1.50054I$ | $-8.43987 - 4.77545I$ | 0 |
| $u = -0.425850 - 1.198780I$<br>$a = -0.104106 - 1.361580I$<br>$b = 0.04697 - 1.50054I$ | $-8.43987 + 4.77545I$ | 0 |
| $u = -1.033450 + 0.798470I$<br>$a = 0.730998 + 0.691800I$<br>$b = -0.83004 + 1.69639I$ | $-5.67762 - 6.64568I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.033450-0.798470I$<br>$a=\ 0.730998-0.691800I$<br>$b=-0.83004-1.69639I$ | $-5.67762+6.64568I$ | 0 |
| $u=\ 0.617943+0.301216I$<br>$a=\ 0.34881-1.60123I$<br>$b=\ 0.582353-0.610573I$ | $-2.48190+3.88876I$ | $-6.60825-4.23609I$ |
| $u=\ 0.617943-0.301216I$<br>$a=\ 0.34881+1.60123I$<br>$b=\ 0.582353+0.610573I$ | $-2.48190-3.88876I$ | $-6.60825+4.23609I$ |
| $u=-0.541139+0.299003I$<br>$a=\ 0.566676-0.958665I$<br>$b=-0.903463+0.302588I$ | $1.87171-0.57875I$ | $2.53846+0.89508I$ |
| $u=-0.541139-0.299003I$<br>$a=\ 0.566676+0.958665I$<br>$b=-0.903463-0.302588I$ | $1.87171+0.57875I$ | $2.53846-0.89508I$ |
| $u=-1.25310+0.70769I$<br>$a=\ 0.303565-0.312300I$<br>$b=-0.378188-0.451986I$ | $-1.93093-4.24065I$ | 0 |
| $u=-1.25310-0.70769I$<br>$a=\ 0.303565+0.312300I$<br>$b=-0.378188+0.451986I$ | $-1.93093+4.24065I$ | 0 |
| $u=-0.298035+0.440845I$<br>$a=-1.21985-2.03266I$<br>$b=\ 0.327599-1.361730I$ | $-3.15077-0.32600I$ | $-3.31381-0.20621I$ |
| $u=-0.298035-0.440845I$<br>$a=-1.21985+2.03266I$<br>$b=\ 0.327599+1.361730I$ | $-3.15077+0.32600I$ | $-3.31381+0.20621I$ |
| $u=\ 0.54081+1.38757I$<br>$a=\ 1.080280+0.283935I$<br>$b=\ 0.0232825+0.0547609I$ | $-2.84867+2.95855I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.54081 - 1.38757I$<br>$a = 1.080280 - 0.283935I$<br>$b = 0.0232825 - 0.0547609I$ | $-2.84867 - 2.95855I$ | 0 |
| $u = -0.34649 + 1.46686I$<br>$a = -1.148290 + 0.269888I$<br>$b = 0.0407835 + 0.0416639I$ | $-6.42429 - 9.16240I$ | 0 |
| $u = -0.34649 - 1.46686I$<br>$a = -1.148290 - 0.269888I$<br>$b = 0.0407835 - 0.0416639I$ | $-6.42429 + 9.16240I$ | 0 |
| $u = -0.295001 + 0.378523I$<br>$a = -2.69695 + 1.42851I$<br>$b = 0.011606 + 0.236913I$ | $1.90922 + 4.76277I$ | $-16.1493 - 2.7551I$ |
| $u = -0.295001 - 0.378523I$<br>$a = -2.69695 - 1.42851I$<br>$b = 0.011606 - 0.236913I$ | $1.90922 - 4.76277I$ | $-16.1493 + 2.7551I$ |
| $u = -1.22798 + 0.89809I$<br>$a = -0.064238 + 0.727432I$<br>$b = -0.27578 + 2.29022I$ | $2.13652 - 3.54958I$ | 0 |
| $u = -1.22798 - 0.89809I$<br>$a = -0.064238 - 0.727432I$<br>$b = -0.27578 - 2.29022I$ | $2.13652 + 3.54958I$ | 0 |
| $u = 0.041949 + 0.445086I$<br>$a = 0.72714 - 1.40677I$<br>$b = -0.406883 + 0.513409I$ | $-3.38531 - 0.33616I$ | $-6.88546 + 1.61686I$ |
| $u = 0.041949 - 0.445086I$<br>$a = 0.72714 + 1.40677I$<br>$b = -0.406883 - 0.513409I$ | $-3.38531 + 0.33616I$ | $-6.88546 - 1.61686I$ |
| $u = 0.53757 + 1.50355I$<br>$a = 0.015470 + 1.161620I$<br>$b = 0.02277 + 1.63386I$ | $-12.20690 - 0.32933I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.53757 - 1.50355I$<br>$a = 0.015470 - 1.161620I$<br>$b = 0.02277 - 1.63386I$ | $-12.20690 + 0.32933I$ | 0 |
| $u = -0.173989 + 0.362246I$<br>$a = 2.79961 - 1.61528I$<br>$b = -0.164585 + 0.163489I$ | $3.33787 - 1.72551I$ | $2.6497 + 15.0642I$ |
| $u = -0.173989 - 0.362246I$<br>$a = 2.79961 + 1.61528I$<br>$b = -0.164585 - 0.163489I$ | $3.33787 + 1.72551I$ | $2.6497 - 15.0642I$ |
| $u = -0.82248 + 1.42357I$<br>$a = 0.269489 + 0.908330I$<br>$b = -0.55475 + 1.85962I$ | $-2.22870 - 6.72906I$ | 0 |
| $u = -0.82248 - 1.42357I$<br>$a = 0.269489 - 0.908330I$<br>$b = -0.55475 - 1.85962I$ | $-2.22870 + 6.72906I$ | 0 |
| $u = 0.338771$<br>$a = 1.65263$<br>$b = 0.356841$ | $-1.00609$ | $-10.0620$ |
| $u = 1.04636 + 1.30233I$<br>$a = -0.359124 + 0.690834I$<br>$b = 0.71719 + 1.97869I$ | $-6.70359 + 4.67707I$ | 0 |
| $u = 1.04636 - 1.30233I$<br>$a = -0.359124 - 0.690834I$<br>$b = 0.71719 - 1.97869I$ | $-6.70359 - 4.67707I$ | 0 |
| $u = 0.65644 + 1.56802I$<br>$a = -0.204936 + 0.969419I$<br>$b = 0.53008 + 1.81422I$ | $-5.48142 + 10.64750I$ | 0 |
| $u = 0.65644 - 1.56802I$<br>$a = -0.204936 - 0.969419I$<br>$b = 0.53008 - 1.81422I$ | $-5.48142 - 10.64750I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.07428+1.44140I$<br>$a=-0.153756-0.968831I$<br>$b=\ \ 0.36684-2.10145I$ | $-12.52170-5.60621I$ | 0 |
| $u=-1.07428-1.44140I$<br>$a=-0.153756+0.968831I$<br>$b=\ \ 0.36684+2.10145I$ | $-12.52170+5.60621I$ | 0 |
| $u=\ \ 1.15083+1.53012I$<br>$a=\ \ 0.203060-0.956730I$<br>$b=-0.38905-2.03922I$ | $-7.62856+11.80710I$ | 0 |
| $u=\ \ 1.15083-1.53012I$<br>$a=\ \ 0.203060+0.956730I$<br>$b=-0.38905+2.03922I$ | $-7.62856-11.80710I$ | 0 |
| $u=-1.16207+1.57256I$<br>$a=-0.221595-0.923585I$<br>$b=\ \ 0.43403-2.03151I$ | $-11.8925-17.9478I$ | 0 |
| $u=-1.16207-1.57256I$<br>$a=-0.221595+0.923585I$<br>$b=\ \ 0.43403+2.03151I$ | $-11.8925+17.9478I$ | 0 |
| $u=-0.10937+2.04865I$<br>$a=\ \ 0.064869+0.774836I$<br>$b=-0.10253+2.06653I$ | $-10.59440-0.47965I$ | 0 |
| $u=-0.10937-2.04865I$<br>$a=\ \ 0.064869-0.774836I$<br>$b=-0.10253-2.06653I$ | $-10.59440+0.47965I$ | 0 |
| $u=\ \ 0.07153+2.08843I$<br>$a=-0.039114-0.924282I$<br>$b=\ \ 0.08777-1.54467I$ | $-9.10546+0.65646I$ | 0 |
| $u=\ \ 0.07153-2.08843I$<br>$a=-0.039114+0.924282I$<br>$b=\ \ 0.08777+1.54467I$ | $-9.10546-0.65646I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \ 0.68233 + 2.08032I$<br>$a = \ 0.282251 - 0.705389I$<br>$b = -0.42753 - 1.76927I$ | $-6.82142 + 1.41177I$ | 0 |
| $u = \ 0.68233 - 2.08032I$<br>$a = \ 0.282251 + 0.705389I$<br>$b = -0.42753 + 1.76927I$ | $-6.82142 - 1.41177I$ | 0 |
| $u = -1.55278 + 1.71717I$<br>$a = -0.478006 - 0.471012I$<br>$b = \ 0.81776 - 1.62699I$ | $-11.15040 - 5.29746I$ | 0 |
| $u = -1.55278 - 1.71717I$<br>$a = -0.478006 + 0.471012I$<br>$b = \ 0.81776 + 1.62699I$ | $-11.15040 + 5.29746I$ | 0 |
| $u = -2.85107 + 0.72491I$<br>$a = -0.528207 - 0.173615I$<br>$b = \ 1.080010 - 0.798521I$ | $-9.05145 + 6.35530I$ | 0 |
| $u = -2.85107 - 0.72491I$<br>$a = -0.528207 + 0.173615I$<br>$b = \ 1.080010 + 0.798521I$ | $-9.05145 - 6.35530I$ | 0 |
| $u = \ 3.09997$<br>$a = \ 0.560468$<br>$b = -1.13002$ | $-4.51649$ | 0 |

**II.**

$\boldsymbol{I_2^u = \langle -2.34\times 10^{55}u^{35}-1.34\times 10^{54}u^{34}+\cdots+2.95\times 10^{55}b+8.02\times 10^{54},\ -7.16\times 10^{55}u^{35}-1.46\times 10^{55}u^{34}+\cdots+2.95\times 10^{55}a+9.34\times 10^{55},\ u^{36}-7u^{34}+\cdots-2u-1\rangle}$

**(i) Arc colorings**

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 2.43091u^{35} + 0.496072u^{34} + \cdots - 22.9785u - 3.17162 \\ 0.793211u^{35} + 0.0454792u^{34} + \cdots - 5.95402u - 0.272304 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 2.43091u^{35} + 0.496072u^{34} + \cdots - 22.9785u - 3.17162 \\ 1.03112u^{35} + 0.0792713u^{34} + \cdots - 9.37708u - 0.768376 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 4.02788u^{35} + 0.607062u^{34} + \cdots - 25.5199u - 1.32580 \\ 1.02707u^{35} + 0.0816316u^{34} + \cdots - 8.15997u - 0.670931 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 3.00081u^{35} + 0.525430u^{34} + \cdots - 17.3599u - 0.654867 \\ 1.02707u^{35} + 0.0816316u^{34} + \cdots - 8.15997u - 0.670931 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.152365u^{35} + 0.0953897u^{34} + \cdots - 12.9688u - 6.66963 \\ 1.27187u^{35} + 0.113464u^{34} + \cdots - 7.70886u - 1.12584 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.248647u^{35} + 0.499958u^{34} + \cdots - 13.9481u - 6.76477 \\ 0.838717u^{35} + 0.104830u^{34} + \cdots - 5.86315u - 0.999036 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 3.36087u^{35} + 0.562276u^{34} + \cdots - 21.4682u - 0.800367 \\ 1.05823u^{35} + 0.0898416u^{34} + \cdots - 8.59372u - 0.707777 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -2.19152u^{35} - 1.11821u^{34} + \cdots + 29.3835u + 10.6503 \\ -1.33959u^{35} - 0.313182u^{34} + \cdots + 10.7485u + 2.41713 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1.89686u^{35} - 0.715494u^{34} + \cdots - 7.70915u + 1.39503 \\ 1.59393u^{35} - 0.0356473u^{34} + \cdots - 7.40203u + 0.546068 \end{pmatrix}$$

**(ii) Obstruction class** $= 1$

**(iii) Cusp Shapes** $= -10.1684u^{35} - 0.0561771u^{34} + \cdots + 47.6955u + 1.53481$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{36} - 13u^{35} + \cdots - u - 1$ |
| $c_2$ | $u^{36} - 2u^{35} + \cdots + 3u - 1$ |
| $c_3$ | $u^{36} - 19u^{34} + \cdots - 6u + 1$ |
| $c_4$ | $u^{36} + 9u^{34} + \cdots - 2u - 1$ |
| $c_5$ | $u^{36} - 5u^{34} + \cdots + u - 1$ |
| $c_6$ | $u^{36} + 2u^{35} + \cdots - 3u - 1$ |
| $c_7$ | $u^{36} - 10u^{35} + \cdots - 11u + 1$ |
| $c_8$ | $u^{36} - 19u^{34} + \cdots + 6u + 1$ |
| $c_9$ | $u^{36} + 11u^{35} + \cdots + 115u + 19$ |
| $c_{10}$ | $u^{36} + 4u^{35} + \cdots + 21u + 1$ |
| $c_{11}$ | $u^{36} - 7u^{34} + \cdots - 2u - 1$ |
| $c_{12}$ | $u^{36} - 11u^{35} + \cdots - 115u + 19$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{36} - 11y^{35} + \cdots - 49y + 1$ |
| $c_2, c_6$ | $y^{36} - 14y^{35} + \cdots + 17y + 1$ |
| $c_3, c_8$ | $y^{36} - 38y^{35} + \cdots - 50y + 1$ |
| $c_4$ | $y^{36} + 18y^{35} + \cdots - 2y + 1$ |
| $c_5$ | $y^{36} - 10y^{35} + \cdots - 9y + 1$ |
| $c_7$ | $y^{36} - 18y^{35} + \cdots - 17y + 1$ |
| $c_9, c_{12}$ | $y^{36} + 21y^{35} + \cdots + 4863y + 361$ |
| $c_{10}$ | $y^{36} - 8y^{35} + \cdots - 139y + 1$ |
| $c_{11}$ | $y^{36} - 14y^{35} + \cdots + 20y + 1$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.758346+0.759079I$<br>$a=-0.551587-0.742977I$<br>$b=-0.486856-1.072750I$ | $-4.62914-2.47996I$ | $-10.56358+2.50815I$ |
| $u=-0.758346-0.759079I$<br>$a=-0.551587+0.742977I$<br>$b=-0.486856+1.072750I$ | $-4.62914+2.47996I$ | $-10.56358-2.50815I$ |
| $u=\ \ 0.986784+0.458970I$<br>$a=\ \ 0.343805+0.288454I$<br>$b=\ \ 0.246555-0.526918I$ | $2.12755+1.87700I$ | $-4.26588+0.05616I$ |
| $u=\ \ 0.986784-0.458970I$<br>$a=\ \ 0.343805-0.288454I$<br>$b=\ \ 0.246555+0.526918I$ | $2.12755-1.87700I$ | $-4.26588-0.05616I$ |
| $u=-1.049650+0.308053I$<br>$a=\ \ 0.174152+0.424408I$<br>$b=-0.256233-0.557024I$ | $1.01006-6.48605I$ | $-6.76824+7.27015I$ |
| $u=-1.049650-0.308053I$<br>$a=\ \ 0.174152-0.424408I$<br>$b=-0.256233+0.557024I$ | $1.01006+6.48605I$ | $-6.76824-7.27015I$ |
| $u=\ \ 0.062817+0.787673I$<br>$a=-0.712585+0.040837I$<br>$b=\ \ 2.43807-0.26663I$ | $-2.55123-7.81026I$ | $6.54419+9.48997I$ |
| $u=\ \ 0.062817-0.787673I$<br>$a=-0.712585-0.040837I$<br>$b=\ \ 2.43807+0.26663I$ | $-2.55123+7.81026I$ | $6.54419-9.48997I$ |
| $u=\ \ 0.780895$<br>$a=\ \ 1.30978$<br>$b=\ \ 1.11296$ | $-0.495008$ | $16.0780$ |
| $u=\ \ 0.851780+0.900829I$<br>$a=-0.589165+0.655490I$<br>$b=\ \ 1.05394+1.79509I$ | $-7.19344+6.51051I$ | $-11.29534-7.14657I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.851780 - 0.900829I$<br>$a = -0.589165 - 0.655490I$<br>$b = 1.05394 - 1.79509I$ | $-7.19344 - 6.51051I$ | $-11.29534 + 7.14657I$ |
| $u = 1.167620 + 0.479341I$<br>$a = -0.014055 - 0.660822I$<br>$b = -0.026402 - 0.604564I$ | $-1.81694 + 5.18500I$ | $-4.91838 - 10.66878I$ |
| $u = 1.167620 - 0.479341I$<br>$a = -0.014055 + 0.660822I$<br>$b = -0.026402 + 0.604564I$ | $-1.81694 - 5.18500I$ | $-4.91838 + 10.66878I$ |
| $u = -0.861711 + 0.998292I$<br>$a = 0.659031 + 0.909886I$<br>$b = -0.65506 + 1.68975I$ | $-4.67805 - 5.87888I$ | $-2.00000 + 6.53027I$ |
| $u = -0.861711 - 0.998292I$<br>$a = 0.659031 - 0.909886I$<br>$b = -0.65506 - 1.68975I$ | $-4.67805 + 5.87888I$ | $-2.00000 - 6.53027I$ |
| $u = 0.047308 + 0.653839I$<br>$a = 0.868301 - 0.251858I$<br>$b = -1.87420 - 1.13481I$ | $2.80054 + 1.91691I$ | $8.40440 + 2.34712I$ |
| $u = 0.047308 - 0.653839I$<br>$a = 0.868301 + 0.251858I$<br>$b = -1.87420 + 1.13481I$ | $2.80054 - 1.91691I$ | $8.40440 - 2.34712I$ |
| $u = -1.195750 + 0.671361I$<br>$a = 0.541134 - 0.373371I$<br>$b = -0.118209 - 0.389142I$ | $0.26050 - 3.06317I$ | $0$ |
| $u = -1.195750 - 0.671361I$<br>$a = 0.541134 + 0.373371I$<br>$b = -0.118209 + 0.389142I$ | $0.26050 + 3.06317I$ | $0$ |
| $u = 1.193600 + 0.680322I$<br>$a = 0.044103 - 0.908189I$<br>$b = -0.36212 - 2.16342I$ | $1.81614 + 3.08089I$ | $0. + 3.61070I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.193600 - 0.680322I$<br>$a = 0.044103 + 0.908189I$<br>$b = -0.36212 + 2.16342I$ | $1.81614 - 3.08089I$ | $0. - 3.61070I$ |
| $u = -1.369080 + 0.199390I$<br>$a = 0.088965 + 0.790438I$<br>$b = -0.03762 + 2.51786I$ | $1.82261 - 4.74293I$ | $0. + 14.3446I$ |
| $u = -1.369080 - 0.199390I$<br>$a = 0.088965 - 0.790438I$<br>$b = -0.03762 - 2.51786I$ | $1.82261 + 4.74293I$ | $0. - 14.3446I$ |
| $u = -0.110672 + 0.533435I$<br>$a = -1.30147 - 0.81865I$<br>$b = 0.94853 - 1.34064I$ | $0.12897 + 4.19935I$ | $-1.33510 - 4.97500I$ |
| $u = -0.110672 - 0.533435I$<br>$a = -1.30147 + 0.81865I$<br>$b = 0.94853 + 1.34064I$ | $0.12897 - 4.19935I$ | $-1.33510 + 4.97500I$ |
| $u = -0.470197 + 0.179567I$<br>$a = -1.33620 + 2.18578I$<br>$b = 0.295231 + 0.045608I$ | $2.21723 + 4.78548I$ | $10.18269 - 5.00993I$ |
| $u = -0.470197 - 0.179567I$<br>$a = -1.33620 - 2.18578I$<br>$b = 0.295231 - 0.045608I$ | $2.21723 - 4.78548I$ | $10.18269 + 5.00993I$ |
| $u = 0.167475 + 0.408927I$<br>$a = 3.01320 + 0.61859I$<br>$b = -0.120856 - 0.194197I$ | $3.26017 - 1.45446I$ | $-5.62697 - 11.58053I$ |
| $u = 0.167475 - 0.408927I$<br>$a = 3.01320 - 0.61859I$<br>$b = -0.120856 + 0.194197I$ | $3.26017 + 1.45446I$ | $-5.62697 + 11.58053I$ |
| $u = -0.021229 + 0.410326I$<br>$a = -0.51907 - 3.11234I$<br>$b = 0.10851 - 1.47364I$ | $-2.98011 - 1.37034I$ | $-1.13062 + 5.64897I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.021229-0.410326I$<br>$a=-0.51907+3.11234I$<br>$b=\ \ 0.10851+1.47364I$ | $-2.98011+1.37034I$ | $-1.13062-5.64897I$ |
| $u=\ \ 2.01173+0.09990I$<br>$a=-0.781567-0.008019I$<br>$b=\ \ 0.464636-0.115864I$ | $-9.65472+6.08763I$ | 0 |
| $u=\ \ 2.01173-0.09990I$<br>$a=-0.781567+0.008019I$<br>$b=\ \ 0.464636+0.115864I$ | $-9.65472-6.08763I$ | 0 |
| $u=\ \ 0.04514+2.14883I$<br>$a=\ \ 0.019624-0.855908I$<br>$b=\ \ 0.02242-1.64302I$ | $-8.83351+0.30527I$ | 0 |
| $u=\ \ 0.04514-2.14883I$<br>$a=\ \ 0.019624+0.855908I$<br>$b=\ \ 0.02242+1.64302I$ | $-8.83351-0.30527I$ | 0 |
| $u=-2.17615$<br>$a=\ \ 0.797002$<br>$b=-0.393628$ | $-4.93586$ | 0 |

**III. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $(u^{36}-13u^{35}+\cdots-u-1)(u^{97}-6u^{96}+\cdots+1.14846\times10^{7}u+1234962)$ |
| $c_2$ | $(u^{36}-2u^{35}+\cdots+3u-1)(u^{97}+3u^{96}+\cdots+38u-1)$ |
| $c_3$ | $(u^{36}-19u^{34}+\cdots-6u+1)(u^{97}-u^{96}+\cdots-45431u+10369)$ |
| $c_4$ | $(u^{36}+9u^{34}+\cdots-2u-1)(u^{97}+3u^{96}+\cdots-524325u+114823)$ |
| $c_5$ | $(u^{36}-5u^{34}+\cdots+u-1)(u^{97}+u^{96}+\cdots+4369766u-1681359)$ |
| $c_6$ | $(u^{36}+2u^{35}+\cdots-3u-1)(u^{97}+3u^{96}+\cdots+38u-1)$ |
| $c_7$ | $(u^{36}-10u^{35}+\cdots-11u+1)(u^{97}+9u^{96}+\cdots+6u+1)$ |
| $c_8$ | $(u^{36}-19u^{34}+\cdots+6u+1)(u^{97}-u^{96}+\cdots-45431u+10369)$ |
| $c_9$ | $(u^{36}+11u^{35}+\cdots+115u+19)(u^{97}-4u^{96}+\cdots+858u+53)$ |
| $c_{10}$ | $(u^{36}+4u^{35}+\cdots+21u+1)(u^{97}-9u^{96}+\cdots-766766u+291457)$ |
| $c_{11}$ | $(u^{36}-7u^{34}+\cdots-2u-1)(u^{97}-3u^{96}+\cdots-326815u-423614)$ |
| $c_{12}$ | $(u^{36}-11u^{35}+\cdots-115u+19)(u^{97}-4u^{96}+\cdots+858u+53)$ |

**IV. Riley Polynomials**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $(y^{36} - 11y^{35} + \cdots - 49y + 1)$ $\cdot (y^{97} - 56y^{96} + \cdots + 104656278490069y - 1525131141444)$ |
| $c_2, c_6$ | $(y^{36} - 14y^{35} + \cdots + 17y + 1)(y^{97} - 87y^{96} + \cdots + 162y - 1)$ |
| $c_3, c_8$ | $(y^{36} - 38y^{35} + \cdots - 50y + 1)$ $\cdot (y^{97} - 99y^{96} + \cdots + 13533582897y - 107516161)$ |
| $c_4$ | $(y^{36} + 18y^{35} + \cdots - 2y + 1)$ $\cdot (y^{97} - 7y^{96} + \cdots - 204662681307y - 13184321329)$ |
| $c_5$ | $(y^{36} - 10y^{35} + \cdots - 9y + 1)$ $\cdot (y^{97} + 33y^{96} + \cdots - 52295137112108y - 2826968086881)$ |
| $c_7$ | $(y^{36} - 18y^{35} + \cdots - 17y + 1)(y^{97} - 23y^{96} + \cdots + 72y - 1)$ |
| $c_9, c_{12}$ | $(y^{36} + 21y^{35} + \cdots + 4863y + 361)$ $\cdot (y^{97} + 64y^{96} + \cdots + 894104y - 2809)$ |
| $c_{10}$ | $(y^{36} - 8y^{35} + \cdots - 139y + 1)$ $\cdot (y^{97} - 45y^{96} + \cdots + 2453858214746y - 84947182849)$ |
| $c_{11}$ | $(y^{36} - 14y^{35} + \cdots + 20y + 1)$ $\cdot (y^{97} + 25y^{96} + \cdots - 3682305657223y - 179448820996)$ |