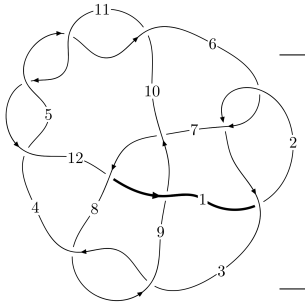
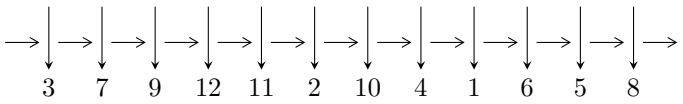
## $12a_{0610}$ $(K12a_{0610})$




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$\begin{aligned}
I_1^u = \langle & -1.93763 \times 10^{105} u^{84} + 6.40033 \times 10^{105} u^{83} + \cdots + 5.22721 \times 10^{105} b - 5.47893 \times 10^{106}, \\
& - 1.05688 \times 10^{107} u^{84} + 1.58154 \times 10^{107} u^{83} + \cdots + 9.93169 \times 10^{106} a + 6.22411 \times 10^{108}, \\
& u^{85} - 2u^{84} + \cdots - 29u + 19 \rangle \\
I_2^u = \langle & -u^{16} - u^{15} + \cdots + b - 3, \\
& - u^{14} - u^{13} + 3u^{12} + 2u^{11} - 8u^{10} - 4u^9 + 12u^8 + 3u^7 - 15u^6 - 3u^5 + 12u^4 + u^3 - 5u^2 + a + 2, \\
& u^{17} + u^{16} + \cdots + u + 1 \rangle
\end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 102 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.** $\boldsymbol{I_1^u = \langle -1.94 \times 10^{105} u^{84} + 6.40 \times 10^{105} u^{83} + \cdots + 5.23 \times 10^{105} b - 5.48 \times 10^{106},\ -1.06 \times 10^{107} u^{84} + 1.58 \times 10^{107} u^{83} + \cdots + 9.93 \times 10^{106} a + 6.22 \times 10^{108},\ u^{85} - 2u^{84} + \cdots - 29u + 19 \rangle}$

**(i) Arc colorings**

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

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} 1.06415u^{84} - 1.59242u^{83} + \cdots - 9.71962u - 62.6691 \\ 0.370682u^{84} - 1.22443u^{83} + \cdots - 53.3393u + 10.4816 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.366811u^{84} - 0.137769u^{83} + \cdots - 48.4547u + 21.4022 \\ -0.349390u^{84} + 0.613843u^{83} + \cdots + 15.4483u + 13.8709 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.0586430u^{84} + 0.345218u^{83} + \cdots - 33.7770u - 4.01764 \\ -0.898344u^{84} + 2.16337u^{83} + \cdots + 76.0579u - 28.6076 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1.35820u^{84} - 1.82953u^{83} + \cdots + 44.0089u - 36.4802 \\ -0.879980u^{84} + 1.21621u^{83} + \cdots + 13.8302u + 15.4803 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1.43484u^{84} - 2.81684u^{83} + \cdots - 63.0589u - 52.1876 \\ 0.370682u^{84} - 1.22443u^{83} + \cdots - 53.3393u + 10.4816 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.861966u^{84} - 1.69287u^{83} + \cdots + 24.3927u - 72.7494 \\ -0.0526491u^{84} + 0.252680u^{83} + \cdots - 29.5740u + 4.29926 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1.28326u^{84} - 2.26001u^{83} + \cdots - 61.0116u - 45.5381 \\ 0.329735u^{84} - 1.20748u^{83} + \cdots - 42.6117u + 13.5326 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -0.130039u^{84} + 0.718141u^{83} + \cdots + 77.5891u - 93.5890$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{85}+30u^{84}+\cdots+17713u+361$ |
| $c_2, c_6$ | $u^{85}-2u^{84}+\cdots-29u+19$ |
| $c_3, c_8$ | $u^{85}-u^{84}+\cdots+26u+19$ |
| $c_4, c_5, c_{10}$ $c_{11}$ | $u^{85}+u^{84}+\cdots-13u+1$ |
| $c_7$ | $u^{85}-14u^{84}+\cdots-548721u+148409$ |
| $c_9$ | $u^{85}+4u^{84}+\cdots+15735u+2737$ |
| $c_{12}$ | $u^{85}-2u^{84}+\cdots-405993u+904999$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{85} + 58y^{84} + \cdots + 17060353y - 130321$ |
| $c_2, c_6$ | $y^{85} - 30y^{84} + \cdots + 17713y - 361$ |
| $c_3, c_8$ | $y^{85} + 77y^{84} + \cdots - 5556y - 361$ |
| $c_4, c_5, c_{10}$ $c_{11}$ | $y^{85} + 109y^{84} + \cdots - 127y - 1$ |
| $c_7$ | $y^{85} + 36y^{84} + \cdots - 93911252195y - 22025231281$ |
| $c_9$ | $y^{85} + 20y^{84} + \cdots + 4057439y - 7491169$ |
| $c_{12}$ | $y^{85} + 44y^{84} + \cdots - 159206128599 61y - 819023190001$ |

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

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.647105 + 0.753959I$<br>$a = -0.224133 - 0.420689I$<br>$b = 0.824332 - 0.180446I$ | $4.70008 + 2.71758I$ | 0 |
| $u = 0.647105 - 0.753959I$<br>$a = -0.224133 + 0.420689I$<br>$b = 0.824332 + 0.180446I$ | $4.70008 - 2.71758I$ | 0 |
| $u = -0.556564 + 0.860766I$<br>$a = -0.36210 - 2.15933I$<br>$b = 0.04521 + 1.67260I$ | $11.69870 + 0.50746I$ | 0 |
| $u = -0.556564 - 0.860766I$<br>$a = -0.36210 + 2.15933I$<br>$b = 0.04521 - 1.67260I$ | $11.69870 - 0.50746I$ | 0 |
| $u = -0.565073 + 0.787127I$<br>$a = -0.40557 + 2.28724I$<br>$b = -0.07092 - 1.67258I$ | $11.70450 - 3.80032I$ | 0 |
| $u = -0.565073 - 0.787127I$<br>$a = -0.40557 - 2.28724I$<br>$b = -0.07092 + 1.67258I$ | $11.70450 + 3.80032I$ | 0 |
| $u = -0.811348 + 0.652520I$<br>$a = -1.95108 - 1.86614I$<br>$b = 0.002056 + 0.816600I$ | $5.99934 + 0.54360I$ | 0 |
| $u = -0.811348 - 0.652520I$<br>$a = -1.95108 + 1.86614I$<br>$b = 0.002056 - 0.816600I$ | $5.99934 - 0.54360I$ | 0 |
| $u = -1.045990 + 0.023525I$<br>$a = 0.675867 + 0.404666I$<br>$b = 0.231608 + 0.627961I$ | $-2.16388 - 1.62762I$ | 0 |
| $u = -1.045990 - 0.023525I$<br>$a = 0.675867 - 0.404666I$<br>$b = 0.231608 - 0.627961I$ | $-2.16388 + 1.62762I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.787091+0.701132I$<br>$a=\ \ 0.86089+1.51565I$<br>$b=\ \ 0.741333-0.874735I$ | $6.62681+2.54168I$ | 0 |
| $u=-0.787091-0.701132I$<br>$a=\ \ 0.86089-1.51565I$<br>$b=\ \ 0.741333+0.874735I$ | $6.62681-2.54168I$ | 0 |
| $u=\ \ 0.727290+0.600758I$<br>$a=-0.317175+0.570445I$<br>$b=\ \ 0.240056-0.954237I$ | $2.60222-1.41006I$ | 0 |
| $u=\ \ 0.727290-0.600758I$<br>$a=-0.317175-0.570445I$<br>$b=\ \ 0.240056+0.954237I$ | $2.60222+1.41006I$ | 0 |
| $u=-0.761116+0.550447I$<br>$a=-0.341801-0.103536I$<br>$b=-0.523133-0.083727I$ | $0.007740+0.354268I$ | 0 |
| $u=-0.761116-0.550447I$<br>$a=-0.341801+0.103536I$<br>$b=-0.523133+0.083727I$ | $0.007740-0.354268I$ | 0 |
| $u=-1.067980+0.060235I$<br>$a=-0.656023+0.333160I$<br>$b=-0.638161-0.121268I$ | $-1.04027+2.23555I$ | 0 |
| $u=-1.067980-0.060235I$<br>$a=-0.656023-0.333160I$<br>$b=-0.638161+0.121268I$ | $-1.04027-2.23555I$ | 0 |
| $u=\ \ 0.826055+0.686952I$<br>$a=-0.20738+3.33992I$<br>$b=-0.01217-1.69343I$ | $15.0313-4.7059I$ | 0 |
| $u=\ \ 0.826055-0.686952I$<br>$a=-0.20738-3.33992I$<br>$b=-0.01217+1.69343I$ | $15.0313+4.7059I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.609980 + 0.679262I$<br>$a = -0.325099 - 1.045890I$<br>$b = -0.300819 + 0.858960I$ | $2.83585 + 2.41811I$ | $-12.00000 + 0.I$ |
| $u = 0.609980 - 0.679262I$<br>$a = -0.325099 + 1.045890I$<br>$b = -0.300819 - 0.858960I$ | $2.83585 - 2.41811I$ | $-12.00000 + 0.I$ |
| $u = -0.612018 + 0.899881I$<br>$a = -0.281445 - 1.092780I$<br>$b = 0.488638 + 1.001550I$ | $8.33566 - 7.04031I$ | 0 |
| $u = -0.612018 - 0.899881I$<br>$a = -0.281445 + 1.092780I$<br>$b = 0.488638 - 1.001550I$ | $8.33566 + 7.04031I$ | 0 |
| $u = 0.897868 + 0.155214I$<br>$a = 1.37373 - 0.80599I$<br>$b = 0.303749 + 0.272887I$ | $-3.24400 - 0.43047I$ | $-16.2817 + 10.9205I$ |
| $u = 0.897868 - 0.155214I$<br>$a = 1.37373 + 0.80599I$<br>$b = 0.303749 - 0.272887I$ | $-3.24400 + 0.43047I$ | $-16.2817 - 10.9205I$ |
| $u = -0.813594 + 0.405787I$<br>$a = 1.90281 + 1.78662I$<br>$b = 0.089790 - 1.372960I$ | $2.17807 + 1.68544I$ | $-12.00000 + 0.I$ |
| $u = -0.813594 - 0.405787I$<br>$a = 1.90281 - 1.78662I$<br>$b = 0.089790 + 1.372960I$ | $2.17807 - 1.68544I$ | $-12.00000 + 0.I$ |
| $u = -0.892941 + 0.643912I$<br>$a = 0.02925 - 2.05496I$<br>$b = -0.032718 + 0.920802I$ | $5.74174 + 4.50633I$ | 0 |
| $u = -0.892941 - 0.643912I$<br>$a = 0.02925 + 2.05496I$<br>$b = -0.032718 - 0.920802I$ | $5.74174 - 4.50633I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.830217 + 0.723714I$<br>$a = 0.56953 - 2.00230I$<br>$b = -0.17837 + 1.75045I$ | $15.7652 + 0.8537I$ | 0 |
| $u = 0.830217 - 0.723714I$<br>$a = 0.56953 + 2.00230I$<br>$b = -0.17837 - 1.75045I$ | $15.7652 - 0.8537I$ | 0 |
| $u = 0.562524 + 0.698432I$<br>$a = -0.632069 + 0.699105I$<br>$b = 0.148063 + 0.105521I$ | $3.91125 - 0.86087I$ | $-7.44019 + 3.38376I$ |
| $u = 0.562524 - 0.698432I$<br>$a = -0.632069 - 0.699105I$<br>$b = 0.148063 - 0.105521I$ | $3.91125 + 0.86087I$ | $-7.44019 - 3.38376I$ |
| $u = -0.932054 + 0.609477I$<br>$a = 0.517583 + 0.527861I$<br>$b = 0.576720 + 0.064604I$ | $-0.55714 + 4.33362I$ | 0 |
| $u = -0.932054 - 0.609477I$<br>$a = 0.517583 - 0.527861I$<br>$b = 0.576720 - 0.064604I$ | $-0.55714 - 4.33362I$ | 0 |
| $u = 0.893893 + 0.681468I$<br>$a = -2.65625 + 2.64884I$<br>$b = -0.00283 - 1.67019I$ | $14.8209 - 0.5681I$ | 0 |
| $u = 0.893893 - 0.681468I$<br>$a = -2.65625 - 2.64884I$<br>$b = -0.00283 + 1.67019I$ | $14.8209 + 0.5681I$ | 0 |
| $u = 0.954964 + 0.633066I$<br>$a = -0.856249 + 0.886381I$<br>$b = -0.403009 - 0.741709I$ | $1.88427 - 3.52097I$ | 0 |
| $u = 0.954964 - 0.633066I$<br>$a = -0.856249 - 0.886381I$<br>$b = -0.403009 + 0.741709I$ | $1.88427 + 3.52097I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.898469 + 0.713573I$<br>$a = 1.90554 - 1.88784I$<br>$b = 0.21178 + 1.71770I$ | $15.5555 - 6.3400I$ | 0 |
| $u = 0.898469 - 0.713573I$<br>$a = 1.90554 + 1.88784I$<br>$b = 0.21178 - 1.71770I$ | $15.5555 + 6.3400I$ | 0 |
| $u = -0.926032 + 0.681783I$<br>$a = 0.478596 + 0.485534I$<br>$b = -0.716859 - 0.982030I$ | $6.19768 + 2.77909I$ | 0 |
| $u = -0.926032 - 0.681783I$<br>$a = 0.478596 - 0.485534I$<br>$b = -0.716859 + 0.982030I$ | $6.19768 - 2.77909I$ | 0 |
| $u = -0.446139 + 1.072420I$<br>$a = -0.098836 + 0.989967I$<br>$b = 0.121122 - 0.860217I$ | $6.78292 + 1.92597I$ | 0 |
| $u = -0.446139 - 1.072420I$<br>$a = -0.098836 - 0.989967I$<br>$b = 0.121122 + 0.860217I$ | $6.78292 - 1.92597I$ | 0 |
| $u = 1.168160 + 0.042928I$<br>$a = 0.554142 + 0.148794I$<br>$b = 0.03344 + 1.61381I$ | $5.64367 - 2.43731I$ | 0 |
| $u = 1.168160 - 0.042928I$<br>$a = 0.554142 - 0.148794I$<br>$b = 0.03344 - 1.61381I$ | $5.64367 + 2.43731I$ | 0 |
| $u = 0.629848 + 0.994180I$<br>$a = -0.04602 + 2.25812I$<br>$b = 0.13524 - 1.71018I$ | $17.7707 + 9.5522I$ | 0 |
| $u = 0.629848 - 0.994180I$<br>$a = -0.04602 - 2.25812I$<br>$b = 0.13524 + 1.71018I$ | $17.7707 - 9.5522I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.005390 + 0.647624I$<br>$a = 1.45289 - 1.00573I$<br>$b = 0.376561 + 0.808119I$ | $1.68859 - 7.58283I$ | 0 |
| $u = 1.005390 - 0.647624I$<br>$a = 1.45289 + 1.00573I$<br>$b = 0.376561 - 0.808119I$ | $1.68859 + 7.58283I$ | 0 |
| $u = -0.802068 + 0.045860I$<br>$a = -0.61059 - 1.85147I$<br>$b = 0.09331 - 1.61773I$ | $11.34640 + 2.99639I$ | $-8.69665 - 2.24681I$ |
| $u = -0.802068 - 0.045860I$<br>$a = -0.61059 + 1.85147I$<br>$b = 0.09331 + 1.61773I$ | $11.34640 - 2.99639I$ | $-8.69665 + 2.24681I$ |
| $u = 0.789258 + 0.059653I$<br>$a = -1.103960 + 0.847330I$<br>$b = -0.328099 - 1.040420I$ | $2.55734 - 1.18348I$ | $-8.52720 + 1.71025I$ |
| $u = 0.789258 - 0.059653I$<br>$a = -1.103960 - 0.847330I$<br>$b = -0.328099 + 1.040420I$ | $2.55734 + 1.18348I$ | $-8.52720 - 1.71025I$ |
| $u = 1.012580 + 0.685568I$<br>$a = -0.181393 + 0.667802I$<br>$b = -0.898129 - 0.088432I$ | $3.61303 - 8.20470I$ | 0 |
| $u = 1.012580 - 0.685568I$<br>$a = -0.181393 - 0.667802I$<br>$b = -0.898129 + 0.088432I$ | $3.61303 + 8.20470I$ | 0 |
| $u = 1.037250 + 0.662366I$<br>$a = 0.345822 + 0.438701I$<br>$b = 0.0335953 - 0.1026880I$ | $2.54217 - 4.42223I$ | 0 |
| $u = 1.037250 - 0.662366I$<br>$a = 0.345822 - 0.438701I$<br>$b = 0.0335953 + 0.1026880I$ | $2.54217 + 4.42223I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.228980 + 0.203243I$<br>$a = -0.536826 + 0.200839I$<br>$b = -0.420598 - 0.753985I$ | $0.87355 - 5.82145I$ | 0 |
| $u = 1.228980 - 0.203243I$<br>$a = -0.536826 - 0.200839I$<br>$b = -0.420598 + 0.753985I$ | $0.87355 + 5.82145I$ | 0 |
| $u = -1.049270 + 0.676448I$<br>$a = 2.33788 + 1.53668I$<br>$b = 0.09332 - 1.66009I$ | $10.28640 + 9.32446I$ | 0 |
| $u = -1.049270 - 0.676448I$<br>$a = 2.33788 - 1.53668I$<br>$b = 0.09332 + 1.66009I$ | $10.28640 - 9.32446I$ | 0 |
| $u = -1.071800 + 0.726814I$<br>$a = -1.01750 - 1.29587I$<br>$b = -0.566947 + 0.990313I$ | $6.9269 + 13.0405I$ | 0 |
| $u = -1.071800 - 0.726814I$<br>$a = -1.01750 + 1.29587I$<br>$b = -0.566947 - 0.990313I$ | $6.9269 - 13.0405I$ | 0 |
| $u = -1.087270 + 0.727678I$<br>$a = -1.41199 - 1.55195I$<br>$b = -0.10415 + 1.64080I$ | $10.13050 + 5.39662I$ | 0 |
| $u = -1.087270 - 0.727678I$<br>$a = -1.41199 + 1.55195I$<br>$b = -0.10415 - 1.64080I$ | $10.13050 - 5.39662I$ | 0 |
| $u = 0.472230 + 1.259750I$<br>$a = 0.13075 - 2.11971I$<br>$b = 0.02922 + 1.67563I$ | $15.7426 - 2.4908I$ | 0 |
| $u = 0.472230 - 1.259750I$<br>$a = 0.13075 + 2.11971I$<br>$b = 0.02922 - 1.67563I$ | $15.7426 + 2.4908I$ | 0 |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.107400 + 0.767076I$<br>$a = -1.75743 + 1.77279I$<br>$b = -0.16023 - 1.71067I$ | $16.2658 - 15.9591I$ | 0 |
| $u = 1.107400 - 0.767076I$<br>$a = -1.75743 - 1.77279I$<br>$b = -0.16023 + 1.71067I$ | $16.2658 + 15.9591I$ | 0 |
| $u = 0.551963 + 0.313389I$<br>$a = -0.964569 + 0.755921I$<br>$b = -0.066335 - 1.023540I$ | $2.38998 - 1.32990I$ | $-6.70793 + 4.87191I$ |
| $u = 0.551963 - 0.313389I$<br>$a = -0.964569 - 0.755921I$<br>$b = -0.066335 + 1.023540I$ | $2.38998 + 1.32990I$ | $-6.70793 - 4.87191I$ |
| $u = -1.152350 + 0.798898I$<br>$a = 0.770641 + 0.797164I$<br>$b = 0.045398 - 0.819870I$ | $4.70193 + 4.76066I$ | 0 |
| $u = -1.152350 - 0.798898I$<br>$a = 0.770641 - 0.797164I$<br>$b = 0.045398 + 0.819870I$ | $4.70193 - 4.76066I$ | 0 |
| $u = -1.380490 + 0.277313I$<br>$a = -0.656547 - 0.660540I$<br>$b = -0.09664 + 1.64151I$ | $9.14952 + 7.66751I$ | 0 |
| $u = -1.380490 - 0.277313I$<br>$a = -0.656547 + 0.660540I$<br>$b = -0.09664 - 1.64151I$ | $9.14952 - 7.66751I$ | 0 |
| $u = -0.563721 + 0.067562I$<br>$a = -1.40491 + 1.49605I$<br>$b = -0.06817 - 1.70836I$ | $12.20380 - 2.58863I$ | $-11.77943 + 3.33602I$ |
| $u = -0.563721 - 0.067562I$<br>$a = -1.40491 - 1.49605I$<br>$b = -0.06817 + 1.70836I$ | $12.20380 + 2.58863I$ | $-11.77943 - 3.33602I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 1.21378 + 0.87933I$<br>$a = 1.10685 - 1.70532I$<br>$b = 0.01240 + 1.66995I$ | $13.5267 - 4.9848I$ | 0 |
| $u = 1.21378 - 0.87933I$<br>$a = 1.10685 + 1.70532I$<br>$b = 0.01240 - 1.66995I$ | $13.5267 + 4.9848I$ | 0 |
| $u = 0.414901 + 0.112651I$<br>$a = -0.19032 + 3.03332I$<br>$b = 0.365746 + 0.532815I$ | $3.75166 - 1.38468I$ | $-10.94065 + 4.57640I$ |
| $u = 0.414901 - 0.112651I$<br>$a = -0.19032 - 3.03332I$<br>$b = 0.365746 - 0.532815I$ | $3.75166 + 1.38468I$ | $-10.94065 - 4.57640I$ |
| $u = -0.310404$<br>$a = -0.683642$<br>$b = -0.308825$ | $-0.534005$ | $-18.4650$ |

**II.**

$\boldsymbol{I_2^u = \langle -u^{16}-u^{15}+\cdots+b-3,\ -u^{14}-u^{13}+\cdots+a+2,\ u^{17}+u^{16}+\cdots+u+1\rangle}$

**(i) Arc colorings**

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

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} u^{14}+u^{13}+\cdots+5u^2-2 \\ u^{16}+u^{15}+\cdots-10u^2+3 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^{13}-u^{12}+2u^{11}+2u^{10}-5u^9-4u^8+4u^7+3u^6-5u^5-3u^4+u^3+u^2 \\ -2u^{16}-u^{15}+\cdots+6u^2-2u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^{16}-u^{15}+\cdots+u-1 \\ -2u^{16}-2u^{15}+\cdots+2u-4 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^{14}-3u^{12}+7u^{10}-u^9-9u^8+u^7+10u^6-2u^5-7u^4-u^3+3u^2+u-1 \\ 3u^{16}+u^{15}+\cdots+3u+2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^{16}+u^{15}+\cdots-5u^2+1 \\ u^{16}+u^{15}+\cdots-10u^2+3 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^4+u^2-1 \\ u^{16}-u^{15}+\cdots+3u-1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^{16}-3u^{14}+\cdots+u+1 \\ u^{16}+u^{15}+\cdots-9u^2+3 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -2u^{16}+5u^{15}+11u^{14}-14u^{13}-28u^{12}+38u^{11}+47u^{10}-53u^9-58u^8+68u^7+52u^6-51u^5-40u^4+26u^3+16u^2-12u-11$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{17} - 7u^{16} + \cdots + 7u - 1$ |
| $c_2$ | $u^{17} - u^{16} + \cdots + u - 1$ |
| $c_3$ | $u^{17} + 10u^{15} + \cdots + 4u - 3$ |
| $c_4, c_5$ | $u^{17} + 12u^{15} + \cdots + 7u + 1$ |
| $c_6$ | $u^{17} + u^{16} + \cdots + u + 1$ |
| $c_7$ | $u^{17} + 3u^{16} + \cdots - 3u - 1$ |
| $c_8$ | $u^{17} + 10u^{15} + \cdots + 4u + 3$ |
| $c_9$ | $u^{17} + 3u^{16} + \cdots + u - 1$ |
| $c_{10}, c_{11}$ | $u^{17} + 12u^{15} + \cdots + 7u - 1$ |
| $c_{12}$ | $u^{17} + u^{16} + \cdots - 3u + 1$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{17} + 13y^{16} + \cdots - 13y - 1$ |
| $c_2, c_6$ | $y^{17} - 7y^{16} + \cdots + 7y - 1$ |
| $c_3, c_8$ | $y^{17} + 20y^{16} + \cdots + 10y - 9$ |
| $c_4, c_5, c_{10}$ $c_{11}$ | $y^{17} + 24y^{16} + \cdots + 35y - 1$ |
| $c_7$ | $y^{17} + 3y^{16} + \cdots - y - 1$ |
| $c_9$ | $y^{17} - y^{16} + \cdots - 3y - 1$ |
| $c_{12}$ | $y^{17} + 3y^{16} + \cdots + y - 1$ |

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

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.720152+0.656706I$<br>$a=\ \ 0.79944+1.95784I$<br>$b=\ \ 0.319931-0.860450I$ | $5.06979+2.15267I$ | $-5.68896-4.26478I$ |
| $u=-0.720152-0.656706I$<br>$a=\ \ 0.79944-1.95784I$<br>$b=\ \ 0.319931+0.860450I$ | $5.06979-2.15267I$ | $-5.68896+4.26478I$ |
| $u=\ \ 0.844913+0.200306I$<br>$a=-1.65011+0.63197I$<br>$b=-0.092358-1.290120I$ | $1.30360-0.87814I$ | $-15.0870-0.5641I$ |
| $u=\ \ 0.844913-0.200306I$<br>$a=-1.65011-0.63197I$<br>$b=-0.092358+1.290120I$ | $1.30360+0.87814I$ | $-15.0870+0.5641I$ |
| $u=-0.862236$<br>$a=-1.51495$<br>$b=-0.147176$ | $-2.99854$ | $-8.51500$ |
| $u=\ \ 0.776801+0.839562I$<br>$a=\ \ 0.78100-2.66977I$<br>$b=\ \ 0.02762+1.69581I$ | $14.4535-3.1568I$ | $-3.79045+2.68402I$ |
| $u=\ \ 0.776801-0.839562I$<br>$a=\ \ 0.78100+2.66977I$<br>$b=\ \ 0.02762-1.69581I$ | $14.4535+3.1568I$ | $-3.79045-2.68402I$ |
| $u=-0.942687+0.675044I$<br>$a=\ \ 0.574582+0.958429I$<br>$b=-0.246755-1.006550I$ | $4.37714+3.08094I$ | $-6.66676-2.63554I$ |
| $u=-0.942687-0.675044I$<br>$a=\ \ 0.574582-0.958429I$<br>$b=-0.246755+1.006550I$ | $4.37714-3.08094I$ | $-6.66676+2.63554I$ |
| $u=\ \ 0.626628+0.526088I$<br>$a=\ \ 0.105161-0.770507I$<br>$b=\ \ 0.374391-0.661733I$ | $4.43105+0.41822I$ | $-4.85621-0.33566I$ |

| Solutions to $I_2^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \ 0.626628 - 0.526088I$<br>$a = \ 0.105161 + 0.770507I$<br>$b = \ 0.374391 + 0.661733I$ | $4.43105 - 0.41822I$ | $-4.85621 + 0.33566I$ |
| $u = \ 1.084210 + 0.640691I$<br>$a = -0.553437 + 0.314492I$<br>$b = -0.309644 - 0.517094I$ | $2.82046 - 5.17696I$ | $-5.91305 + 8.94380I$ |
| $u = \ 1.084210 - 0.640691I$<br>$a = -0.553437 - 0.314492I$<br>$b = -0.309644 + 0.517094I$ | $2.82046 + 5.17696I$ | $-5.91305 - 8.94380I$ |
| $u = -0.541603 + 0.427521I$<br>$a = -0.051956 - 0.620358I$<br>$b = \ 0.09256 + 1.67798I$ | $12.88990 - 2.20254I$ | $-1.59840 - 1.45365I$ |
| $u = -0.541603 - 0.427521I$<br>$a = -0.051956 + 0.620358I$<br>$b = \ 0.09256 - 1.67798I$ | $12.88990 + 2.20254I$ | $-1.59840 + 1.45365I$ |
| $u = -1.196990 + 0.623400I$<br>$a = -1.24721 - 0.98437I$<br>$b = -0.09216 + 1.61922I$ | $10.43660 + 6.68767I$ | $-4.14164 - 6.03567I$ |
| $u = -1.196990 - 0.623400I$<br>$a = -1.24721 + 0.98437I$<br>$b = -0.09216 - 1.61922I$ | $10.43660 - 6.68767I$ | $-4.14164 + 6.03567I$ |

**III. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $(u^{17}-7u^{16}+\cdots+7u-1)(u^{85}+30u^{84}+\cdots+17713u+361)$ |
| $c_2$ | $(u^{17}-u^{16}+\cdots+u-1)(u^{85}-2u^{84}+\cdots-29u+19)$ |
| $c_3$ | $(u^{17}+10u^{15}+\cdots+4u-3)(u^{85}-u^{84}+\cdots+26u+19)$ |
| $c_4, c_5$ | $(u^{17}+12u^{15}+\cdots+7u+1)(u^{85}+u^{84}+\cdots-13u+1)$ |
| $c_6$ | $(u^{17}+u^{16}+\cdots+u+1)(u^{85}-2u^{84}+\cdots-29u+19)$ |
| $c_7$ | $(u^{17}+3u^{16}+\cdots-3u-1)(u^{85}-14u^{84}+\cdots-548721u+148409)$ |
| $c_8$ | $(u^{17}+10u^{15}+\cdots+4u+3)(u^{85}-u^{84}+\cdots+26u+19)$ |
| $c_9$ | $(u^{17}+3u^{16}+\cdots+u-1)(u^{85}+4u^{84}+\cdots+15735u+2737)$ |
| $c_{10}, c_{11}$ | $(u^{17}+12u^{15}+\cdots+7u-1)(u^{85}+u^{84}+\cdots-13u+1)$ |
| $c_{12}$ | $(u^{17}+u^{16}+\cdots-3u+1)(u^{85}-2u^{84}+\cdots-405993u+904999)$ |

**IV. Riley Polynomials**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $(y^{17}+13y^{16}+\cdots-13y-1)$ $\cdot(y^{85}+58y^{84}+\cdots+17060353y-130321)$ |
| $c_2, c_6$ | $(y^{17}-7y^{16}+\cdots+7y-1)(y^{85}-30y^{84}+\cdots+17713y-361)$ |
| $c_3, c_8$ | $(y^{17}+20y^{16}+\cdots+10y-9)(y^{85}+77y^{84}+\cdots-5556y-361)$ |
| $c_4, c_5, c_{10}$ $c_{11}$ | $(y^{17}+24y^{16}+\cdots+35y-1)(y^{85}+109y^{84}+\cdots-127y-1)$ |
| $c_7$ | $(y^{17}+3y^{16}+\cdots-y-1)$ $\cdot(y^{85}+36y^{84}+\cdots-93911252195y-22025231281)$ |
| $c_9$ | $(y^{17}-y^{16}+\cdots-3y-1)(y^{85}+20y^{84}+\cdots+4057439y-7491169)$ |
| $c_{12}$ | $(y^{17}+3y^{16}+\cdots+y-1)$ $\cdot(y^{85}+44y^{84}+\cdots-15920612859961y-819023190001)$ |