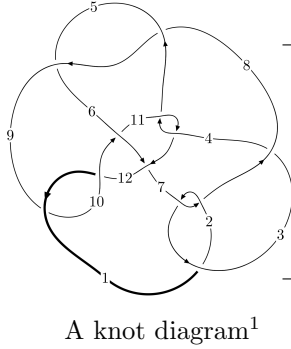
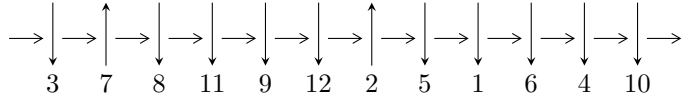


12a<sub>0547</sub> (K12a<sub>0547</sub>)



**Linearized knot diagram**



**Solving Sequence**

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

**Ideals for irreducible components<sup>2</sup> of  $X_{\text{par}}$**

$$I_1^u = \langle -1.82820 \times 10^{271} u^{152} + 1.44234 \times 10^{271} u^{151} + \dots + 2.04979 \times 10^{271} b + 3.56914 \times 10^{272}, \\ 4.13842 \times 10^{272} u^{152} + 4.80709 \times 10^{272} u^{151} + \dots + 2.25477 \times 10^{272} a + 5.49438 \times 10^{273}, \\ u^{153} + u^{152} + \dots + 28u + 11 \rangle$$

$$I_2^u = \langle -15u^{36} + 4u^{35} + \dots + b + 12, 3u^{36} - u^{35} + \dots + a + 4, u^{37} + 10u^{35} + \dots + 7u^2 + 1 \rangle$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 190 representations.

<sup>1</sup>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>).

<sup>2</sup>All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

$$\text{I. } I_1^u = \langle -1.83 \times 10^{271} u^{152} + 1.44 \times 10^{271} u^{151} + \dots + 2.05 \times 10^{271} b + 3.57 \times 10^{272}, 4.14 \times 10^{272} u^{152} + 4.81 \times 10^{272} u^{151} + \dots + 2.25 \times 10^{272} a + 5.49 \times 10^{273}, u^{153} + u^{152} + \dots + 28u + 11 \rangle$$

(i) Arc colorings

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

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

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

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

$$a_4 = \begin{pmatrix} -u^3 \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -1.83540u^{152} - 2.13196u^{151} + \dots - 55.6512u - 24.3678 \\ 0.891895u^{152} - 0.703650u^{151} + \dots - 15.7291u - 17.4122 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -3.07699u^{152} + 0.677463u^{151} + \dots - 31.4818u - 0.617562 \\ -0.627358u^{152} - 1.90774u^{151} + \dots - 44.2921u - 19.0364 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.541198u^{152} - 4.00467u^{151} + \dots - 73.7467u - 47.3026 \\ 1.32157u^{152} + 0.752987u^{151} + \dots + 18.8733u - 1.48239 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -2.06938u^{152} - 1.82937u^{151} + \dots - 53.0326u - 22.5137 \\ 0.934884u^{152} - 1.02868u^{151} + \dots - 17.9375u - 17.6217 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -2.75509u^{152} + 0.779317u^{151} + \dots - 25.6683u - 2.59189 \\ -1.43719u^{152} - 3.10153u^{151} + \dots - 82.2229u - 39.1923 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -1.72401u^{152} - 2.92931u^{151} + \dots - 75.4883u - 35.5372 \\ 1.63954u^{152} - 0.541052u^{151} + \dots + 7.50025u - 9.41830 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $4.17995u^{152} - 1.07008u^{151} + \dots + 20.1517u - 47.8921$

(iv) u-Polynomials at the component

| Crossings     | u-Polynomials at each crossing                    |
|---------------|---|
| $c_1$         | $u^{153} + 77u^{152} + \dots - 1548u - 121$       |
| $c_2, c_7$    | $u^{153} + u^{152} + \dots + 28u + 11$            |
| $c_3$         | $u^{153} - u^{152} + \dots + 13334880u + 1770791$ |
| $c_4, c_{11}$ | $u^{153} + 2u^{152} + \dots + 3u + 1$             |
| $c_5, c_8$    | $u^{153} - 50u^{151} + \dots + 8395u + 10331$     |
| $c_6$         | $u^{153} + u^{152} + \dots + 869544u + 253007$    |
| $c_9, c_{12}$ | $u^{153} - 4u^{152} + \dots - 52195u + 4961$      |
| $c_{10}$      | $u^{153} - u^{152} + \dots + 35046u + 9439$       |

(v) Riley Polynomials at the component

| Crossings     | Riley Polynomials at each crossing                               |
|---------------|--|
| $c_1$         | $y^{153} + 5y^{152} + \dots - 286508y - 14641$                   |
| $c_2, c_7$    | $y^{153} + 77y^{152} + \dots - 1548y - 121$                      |
| $c_3$         | $y^{153} - 67y^{152} + \dots - 141584742282518y - 3135700765681$ |
| $c_4, c_{11}$ | $y^{153} + 84y^{152} + \dots - 39y - 1$                          |
| $c_5, c_8$    | $y^{153} - 100y^{152} + \dots + 4473444915y - 106729561$         |
| $c_6$         | $y^{153} + 25y^{152} + \dots - 1962648262454y - 64012542049$     |
| $c_9, c_{12}$ | $y^{153} + 80y^{152} + \dots - 798994097y - 24611521$            |
| $c_{10}$      | $y^{153} + 17y^{152} + \dots - 7057634132y - 89094721$           |

(vi) Complex Volumes and Cusp Shapes

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = -0.803169 + 0.577760I$<br>$a = 0.654727 - 0.658081I$<br>$b = -2.16547 + 0.07601I$   | $2.89636 + 2.62923I$                  | 0          |
| $u = -0.803169 - 0.577760I$<br>$a = 0.654727 + 0.658081I$<br>$b = -2.16547 - 0.07601I$   | $2.89636 - 2.62923I$                  | 0          |
| $u = -1.004370 + 0.112798I$<br>$a = -0.307076 - 0.833264I$<br>$b = 0.592813 + 1.118070I$ | $-1.59495 + 1.22097I$                 | 0          |
| $u = -1.004370 - 0.112798I$<br>$a = -0.307076 + 0.833264I$<br>$b = 0.592813 - 1.118070I$ | $-1.59495 - 1.22097I$                 | 0          |
| $u = -0.420378 + 0.885705I$<br>$a = 1.45676 + 0.24596I$<br>$b = -1.23957 - 0.84798I$     | $1.16632 + 2.69264I$                  | 0          |
| $u = -0.420378 - 0.885705I$<br>$a = 1.45676 - 0.24596I$<br>$b = -1.23957 + 0.84798I$     | $1.16632 - 2.69264I$                  | 0          |
| $u = -0.169016 + 1.013590I$<br>$a = 1.214710 + 0.245532I$<br>$b = -0.462782 - 0.735315I$ | $-1.48405 + 1.57407I$                 | 0          |
| $u = -0.169016 - 1.013590I$<br>$a = 1.214710 - 0.245532I$<br>$b = -0.462782 + 0.735315I$ | $-1.48405 - 1.57407I$                 | 0          |
| $u = 0.661362 + 0.709297I$<br>$a = 0.463802 - 0.665196I$<br>$b = 1.51391 + 0.38433I$     | $1.30435 + 5.87704I$                  | 0          |
| $u = 0.661362 - 0.709297I$<br>$a = 0.463802 + 0.665196I$<br>$b = 1.51391 - 0.38433I$     | $1.30435 - 5.87704I$                  | 0          |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = -0.661394 + 0.698725I$<br>$a = -0.054834 + 0.347458I$<br>$b = 1.60907 + 0.63444I$ | $7.98668 - 5.17937I$                  | 0          |
| $u = -0.661394 - 0.698725I$<br>$a = -0.054834 - 0.347458I$<br>$b = 1.60907 - 0.63444I$ | $7.98668 + 5.17937I$                  | 0          |
| $u = 0.926965 + 0.468778I$<br>$a = -0.899004 + 0.412334I$<br>$b = 2.08791 - 1.45289I$  | $0.49601 - 3.67330I$                  | 0          |
| $u = 0.926965 - 0.468778I$<br>$a = -0.899004 - 0.412334I$<br>$b = 2.08791 + 1.45289I$  | $0.49601 + 3.67330I$                  | 0          |
| $u = 0.922348 + 0.250824I$<br>$a = 0.432284 - 1.050650I$<br>$b = -1.42601 + 1.70545I$  | $0.69176 - 1.30939I$                  | 0          |
| $u = 0.922348 - 0.250824I$<br>$a = 0.432284 + 1.050650I$<br>$b = -1.42601 - 1.70545I$  | $0.69176 + 1.30939I$                  | 0          |
| $u = 0.599653 + 0.866993I$<br>$a = -0.12882 - 1.44661I$<br>$b = 1.282060 - 0.139973I$  | $0.836296 - 0.978230I$                | 0          |
| $u = 0.599653 - 0.866993I$<br>$a = -0.12882 + 1.44661I$<br>$b = 1.282060 + 0.139973I$  | $0.836296 + 0.978230I$                | 0          |
| $u = 0.024048 + 1.060330I$<br>$a = 1.70255 + 0.01296I$<br>$b = -0.953502 - 0.444769I$  | $0.19382 + 2.04626I$                  | 0          |
| $u = 0.024048 - 1.060330I$<br>$a = 1.70255 - 0.01296I$<br>$b = -0.953502 + 0.444769I$  | $0.19382 - 2.04626I$                  | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.885318 + 0.300352I$<br>$a = 0.282592 + 0.613095I$<br>$b = -1.86384 - 1.14675I$    | $2.3619 + 14.1579I$                   | 0          |
| $u = -0.885318 - 0.300352I$<br>$a = 0.282592 - 0.613095I$<br>$b = -1.86384 + 1.14675I$    | $2.3619 - 14.1579I$                   | 0          |
| $u = -0.538737 + 0.761034I$<br>$a = -0.809151 - 1.144800I$<br>$b = -1.272290 + 0.084596I$ | $4.31832 - 2.17917I$                  | 0          |
| $u = -0.538737 - 0.761034I$<br>$a = -0.809151 + 1.144800I$<br>$b = -1.272290 - 0.084596I$ | $4.31832 + 2.17917I$                  | 0          |
| $u = 0.265107 + 1.037410I$<br>$a = -0.391450 - 0.151234I$<br>$b = 0.808245 + 0.272149I$   | $1.63828 + 3.80010I$                  | 0          |
| $u = 0.265107 - 1.037410I$<br>$a = -0.391450 + 0.151234I$<br>$b = 0.808245 - 0.272149I$   | $1.63828 - 3.80010I$                  | 0          |
| $u = -0.529733 + 0.745288I$<br>$a = 0.27196 - 1.60407I$<br>$b = -0.847186 + 0.569319I$    | $1.48585 - 6.62716I$                  | 0          |
| $u = -0.529733 - 0.745288I$<br>$a = 0.27196 + 1.60407I$<br>$b = -0.847186 - 0.569319I$    | $1.48585 + 6.62716I$                  | 0          |
| $u = -0.626068 + 0.894564I$<br>$a = 0.64894 + 2.15812I$<br>$b = 1.34997 - 1.01960I$       | $7.41917 + 0.20736I$                  | 0          |
| $u = -0.626068 - 0.894564I$<br>$a = 0.64894 - 2.15812I$<br>$b = 1.34997 + 1.01960I$       | $7.41917 - 0.20736I$                  | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.113240 + 1.098040I$<br>$a = -2.40907 + 1.47465I$<br>$b = 1.004810 - 0.952987I$   | $-5.34213 - 1.63294I$                 | 0          |
| $u = 0.113240 - 1.098040I$<br>$a = -2.40907 - 1.47465I$<br>$b = 1.004810 + 0.952987I$   | $-5.34213 + 1.63294I$                 | 0          |
| $u = 0.737210 + 0.499189I$<br>$a = 0.035993 - 0.473925I$<br>$b = -1.232050 + 0.370722I$ | $5.42547 + 0.75189I$                  | 0          |
| $u = 0.737210 - 0.499189I$<br>$a = 0.035993 + 0.473925I$<br>$b = -1.232050 - 0.370722I$ | $5.42547 - 0.75189I$                  | 0          |
| $u = -0.427201 + 1.025550I$<br>$a = 1.46652 - 2.59746I$<br>$b = -2.03822 - 0.26994I$    | $-0.07991 + 1.48262I$                 | 0          |
| $u = -0.427201 - 1.025550I$<br>$a = 1.46652 + 2.59746I$<br>$b = -2.03822 + 0.26994I$    | $-0.07991 - 1.48262I$                 | 0          |
| $u = 0.524046 + 0.983672I$<br>$a = -0.204309 + 0.610614I$<br>$b = 0.244671 - 0.234525I$ | $2.01558 + 2.87049I$                  | 0          |
| $u = 0.524046 - 0.983672I$<br>$a = -0.204309 - 0.610614I$<br>$b = 0.244671 + 0.234525I$ | $2.01558 - 2.87049I$                  | 0          |
| $u = 0.795132 + 0.784678I$<br>$a = 0.418719 + 1.070430I$<br>$b = -2.11529 - 0.37904I$   | $5.30275 + 10.77780I$                 | 0          |
| $u = 0.795132 - 0.784678I$<br>$a = 0.418719 - 1.070430I$<br>$b = -2.11529 + 0.37904I$   | $5.30275 - 10.77780I$                 | 0          |



| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = -0.467919 + 1.030120I$<br>$a = -0.486150 + 0.390238I$<br>$b = 1.266510 + 0.358123I$ | $-4.17331 - 3.13943I$                 | 0          |
| $u = -0.467919 - 1.030120I$<br>$a = -0.486150 - 0.390238I$<br>$b = 1.266510 - 0.358123I$ | $-4.17331 + 3.13943I$                 | 0          |
| $u = -0.422936 + 1.051470I$<br>$a = -1.64652 - 2.71399I$<br>$b = -0.279492 + 1.009320I$  | $2.80395 - 0.18184I$                  | 0          |
| $u = -0.422936 - 1.051470I$<br>$a = -1.64652 + 2.71399I$<br>$b = -0.279492 - 1.009320I$  | $2.80395 + 0.18184I$                  | 0          |
| $u = -0.728290 + 0.455821I$<br>$a = -0.255788 - 0.431460I$<br>$b = -1.71113 - 0.25408I$  | $5.24838 + 3.35209I$                  | 0          |
| $u = -0.728290 - 0.455821I$<br>$a = -0.255788 + 0.431460I$<br>$b = -1.71113 + 0.25408I$  | $5.24838 - 3.35209I$                  | 0          |
| $u = -0.805772 + 0.293840I$<br>$a = 0.125125 - 0.537652I$<br>$b = 1.59272 + 0.94279I$    | $-0.88656 + 8.08747I$                 | 0          |
| $u = -0.805772 - 0.293840I$<br>$a = 0.125125 + 0.537652I$<br>$b = 1.59272 - 0.94279I$    | $-0.88656 - 8.08747I$                 | 0          |
| $u = -0.415484 + 1.068520I$<br>$a = -1.264150 + 0.217576I$<br>$b = 1.020550 + 0.631809I$ | $-3.51137 - 3.38573I$                 | 0          |
| $u = -0.415484 - 1.068520I$<br>$a = -1.264150 - 0.217576I$<br>$b = 1.020550 - 0.631809I$ | $-3.51137 + 3.38573I$                 | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.436413 + 1.062230I$<br>$a = -2.81312 + 1.71557I$<br>$b = 1.01179 - 1.77752I$     | $-3.07142 + 1.23078I$                 | 0          |
| $u = 0.436413 - 1.062230I$<br>$a = -2.81312 - 1.71557I$<br>$b = 1.01179 + 1.77752I$     | $-3.07142 - 1.23078I$                 | 0          |
| $u = 0.214188 + 0.812689I$<br>$a = 0.522372 + 0.212518I$<br>$b = -0.129247 - 0.290374I$ | $-0.573771 + 1.117010I$               | 0          |
| $u = 0.214188 - 0.812689I$<br>$a = 0.522372 - 0.212518I$<br>$b = -0.129247 + 0.290374I$ | $-0.573771 - 1.117010I$               | 0          |
| $u = 0.791592 + 0.279934I$<br>$a = 0.010624 + 0.208496I$<br>$b = 1.83748 - 0.03341I$    | $5.85581 - 7.23825I$                  | 0          |
| $u = 0.791592 - 0.279934I$<br>$a = 0.010624 - 0.208496I$<br>$b = 1.83748 + 0.03341I$    | $5.85581 + 7.23825I$                  | 0          |
| $u = 0.484218 + 1.074660I$<br>$a = 0.80584 - 3.69106I$<br>$b = 1.57664 + 1.61174I$      | $-2.70678 + 5.64464I$                 | 0          |
| $u = 0.484218 - 1.074660I$<br>$a = 0.80584 + 3.69106I$<br>$b = 1.57664 - 1.61174I$      | $-2.70678 - 5.64464I$                 | 0          |
| $u = 0.355257 + 1.125980I$<br>$a = -1.022580 + 0.111630I$<br>$b = 0.030616 + 0.297694I$ | $-7.39263 + 2.02832I$                 | 0          |
| $u = 0.355257 - 1.125980I$<br>$a = -1.022580 - 0.111630I$<br>$b = 0.030616 - 0.297694I$ | $-7.39263 - 2.02832I$                 | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|---|---------------------------------------|-----------------------|
| $u = -0.495307 + 1.075110I$<br>$a = 1.37526 + 2.72517I$<br>$b = 0.313367 - 1.252430I$   | $3.36604 - 6.63400I$                  | 0                     |
| $u = -0.495307 - 1.075110I$<br>$a = 1.37526 - 2.72517I$<br>$b = 0.313367 + 1.252430I$   | $3.36604 + 6.63400I$                  | 0                     |
| $u = -0.498143 + 1.073910I$<br>$a = -1.19365 + 1.96600I$<br>$b = 1.73648 - 0.00647I$    | $-2.99168 - 3.47198I$                 | 0                     |
| $u = -0.498143 - 1.073910I$<br>$a = -1.19365 - 1.96600I$<br>$b = 1.73648 + 0.00647I$    | $-2.99168 + 3.47198I$                 | 0                     |
| $u = 0.336033 + 1.135300I$<br>$a = 1.59010 - 0.29813I$<br>$b = -1.084310 + 0.461830I$   | $-1.70702 + 0.20417I$                 | 0                     |
| $u = 0.336033 - 1.135300I$<br>$a = 1.59010 + 0.29813I$<br>$b = -1.084310 - 0.461830I$   | $-1.70702 - 0.20417I$                 | 0                     |
| $u = 0.777805 + 0.238252I$<br>$a = 0.736978 - 0.649162I$<br>$b = -0.129376 + 0.136119I$ | $-0.91343 - 7.83033I$                 | $-8.00000 + 5.36238I$ |
| $u = 0.777805 - 0.238252I$<br>$a = 0.736978 + 0.649162I$<br>$b = -0.129376 - 0.136119I$ | $-0.91343 + 7.83033I$                 | $-8.00000 - 5.36238I$ |
| $u = 0.800176 + 0.877926I$<br>$a = 0.88752 + 1.47851I$<br>$b = -2.10313 - 0.10183I$     | $5.06004 - 4.90030I$                  | 0                     |
| $u = 0.800176 - 0.877926I$<br>$a = 0.88752 - 1.47851I$<br>$b = -2.10313 + 0.10183I$     | $5.06004 + 4.90030I$                  | 0                     |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape             |
|---|---------------------------------------|------------------------|
| $u = 0.518758 + 1.070880I$<br>$a = -0.419405 - 1.157740I$<br>$b = 1.076190 - 0.340141I$   | $3.16301 + 2.84324I$                  | 0                      |
| $u = 0.518758 - 1.070880I$<br>$a = -0.419405 + 1.157740I$<br>$b = 1.076190 + 0.340141I$   | $3.16301 - 2.84324I$                  | 0                      |
| $u = 0.604831 + 0.537268I$<br>$a = 0.153128 - 0.747016I$<br>$b = -0.170830 + 0.266794I$   | $3.31184 + 1.61796I$                  | $-8.00000 + 0.I$       |
| $u = 0.604831 - 0.537268I$<br>$a = 0.153128 + 0.747016I$<br>$b = -0.170830 - 0.266794I$   | $3.31184 - 1.61796I$                  | $-8.00000 + 0.I$       |
| $u = -0.804054 + 0.028913I$<br>$a = 0.0738268 + 0.0031876I$<br>$b = 0.342861 + 0.482325I$ | $-1.96641 + 1.44396I$                 | $-10.10047 - 1.74700I$ |
| $u = -0.804054 - 0.028913I$<br>$a = 0.0738268 - 0.0031876I$<br>$b = 0.342861 - 0.482325I$ | $-1.96641 - 1.44396I$                 | $-10.10047 + 1.74700I$ |
| $u = -0.529515 + 1.072320I$<br>$a = 1.36972 - 0.52815I$<br>$b = -1.43026 - 0.35470I$      | $0.80352 - 7.91545I$                  | 0                      |
| $u = -0.529515 - 1.072320I$<br>$a = 1.36972 + 0.52815I$<br>$b = -1.43026 + 0.35470I$      | $0.80352 + 7.91545I$                  | 0                      |
| $u = 0.278954 + 1.170680I$<br>$a = -2.04057 - 0.50987I$<br>$b = 1.53105 - 0.21670I$       | $1.35908 - 4.03523I$                  | 0                      |
| $u = 0.278954 - 1.170680I$<br>$a = -2.04057 + 0.50987I$<br>$b = 1.53105 + 0.21670I$       | $1.35908 + 4.03523I$                  | 0                      |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.254270 + 1.185540I$<br>$a = -2.13863 - 1.09344I$<br>$b = 1.28167 + 0.96987I$    | $-5.56411 + 4.90770I$                 | 0          |
| $u = -0.254270 - 1.185540I$<br>$a = -2.13863 + 1.09344I$<br>$b = 1.28167 - 0.96987I$    | $-5.56411 - 4.90770I$                 | 0          |
| $u = 0.607861 + 1.049160I$<br>$a = -0.01178 + 1.98308I$<br>$b = -0.921894 - 0.660627I$  | $3.80249 + 4.36928I$                  | 0          |
| $u = 0.607861 - 1.049160I$<br>$a = -0.01178 - 1.98308I$<br>$b = -0.921894 + 0.660627I$  | $3.80249 - 4.36928I$                  | 0          |
| $u = -0.581277 + 1.070960I$<br>$a = 0.41404 - 2.18203I$<br>$b = -1.87012 + 0.52084I$    | $3.42627 - 8.35156I$                  | 0          |
| $u = -0.581277 - 1.070960I$<br>$a = 0.41404 + 2.18203I$<br>$b = -1.87012 - 0.52084I$    | $3.42627 + 8.35156I$                  | 0          |
| $u = 0.396784 + 1.155950I$<br>$a = 2.89958 - 1.26714I$<br>$b = -1.40518 + 1.46228I$     | $-3.41797 - 1.17717I$                 | 0          |
| $u = 0.396784 - 1.155950I$<br>$a = 2.89958 + 1.26714I$<br>$b = -1.40518 - 1.46228I$     | $-3.41797 + 1.17717I$                 | 0          |
| $u = 0.304939 + 1.184940I$<br>$a = 0.987353 - 0.056795I$<br>$b = -0.158035 - 0.252883I$ | $-5.24129 - 4.41690I$                 | 0          |
| $u = 0.304939 - 1.184940I$<br>$a = 0.987353 + 0.056795I$<br>$b = -0.158035 + 0.252883I$ | $-5.24129 + 4.41690I$                 | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|---|---------------------------------------|-----------------------|
| $u = -0.626569 + 1.062030I$<br>$a = 0.97901 - 2.18234I$<br>$b = -2.04671 + 0.62504I$      | $1.38311 - 8.00166I$                  | 0                     |
| $u = -0.626569 - 1.062030I$<br>$a = 0.97901 + 2.18234I$<br>$b = -2.04671 - 0.62504I$      | $1.38311 + 8.00166I$                  | 0                     |
| $u = -0.652876 + 0.399979I$<br>$a = -0.042548 - 0.783913I$<br>$b = -0.959350 + 0.188021I$ | $2.75263 + 3.31067I$                  | $-4.78268 - 2.44794I$ |
| $u = -0.652876 - 0.399979I$<br>$a = -0.042548 + 0.783913I$<br>$b = -0.959350 - 0.188021I$ | $2.75263 - 3.31067I$                  | $-4.78268 + 2.44794I$ |
| $u = 0.513181 + 1.127210I$<br>$a = -0.494940 - 0.841920I$<br>$b = -0.075096 + 0.195869I$  | $-6.29750 + 5.72449I$                 | 0                     |
| $u = 0.513181 - 1.127210I$<br>$a = -0.494940 + 0.841920I$<br>$b = -0.075096 - 0.195869I$  | $-6.29750 - 5.72449I$                 | 0                     |
| $u = 0.716816 + 0.223428I$<br>$a = -0.319148 - 0.645624I$<br>$b = -1.273520 + 0.282810I$  | $2.20690 - 3.05991I$                  | $-4.94983 + 2.95032I$ |
| $u = 0.716816 - 0.223428I$<br>$a = -0.319148 + 0.645624I$<br>$b = -1.273520 - 0.282810I$  | $2.20690 + 3.05991I$                  | $-4.94983 - 2.95032I$ |
| $u = 0.492970 + 1.148300I$<br>$a = 0.02850 + 3.84157I$<br>$b = -1.78955 - 1.50932I$       | $-2.73820 + 9.28492I$                 | 0                     |
| $u = 0.492970 - 1.148300I$<br>$a = 0.02850 - 3.84157I$<br>$b = -1.78955 + 1.50932I$       | $-2.73820 - 9.28492I$                 | 0                     |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|--|---------------------------------------|-----------------------|
| $u = 0.520803 + 1.141260I$<br>$a = 0.511173 + 2.15597I$<br>$b = -1.40784 - 0.36801I$     | $-0.43649 + 7.74062I$                 | 0                     |
| $u = 0.520803 - 1.141260I$<br>$a = 0.511173 - 2.15597I$<br>$b = -1.40784 + 0.36801I$     | $-0.43649 - 7.74062I$                 | 0                     |
| $u = 0.249185 + 1.240000I$<br>$a = 2.54342 - 1.62987I$<br>$b = -1.21371 + 1.26680I$      | $-4.38413 + 2.37619I$                 | 0                     |
| $u = 0.249185 - 1.240000I$<br>$a = 2.54342 + 1.62987I$<br>$b = -1.21371 - 1.26680I$      | $-4.38413 - 2.37619I$                 | 0                     |
| $u = -0.733805 + 0.033596I$<br>$a = -0.389271 + 0.173878I$<br>$b = 0.343342 + 0.651786I$ | $-2.11339 + 1.38961I$                 | $-8.75300 - 4.56908I$ |
| $u = -0.733805 - 0.033596I$<br>$a = -0.389271 - 0.173878I$<br>$b = 0.343342 - 0.651786I$ | $-2.11339 - 1.38961I$                 | $-8.75300 + 4.56908I$ |
| $u = -0.491152 + 1.169130I$<br>$a = 0.049291 + 0.730421I$<br>$b = 0.082986 - 0.647105I$  | $-5.26325 - 5.85056I$                 | 0                     |
| $u = -0.491152 - 1.169130I$<br>$a = 0.049291 - 0.730421I$<br>$b = 0.082986 + 0.647105I$  | $-5.26325 + 5.85056I$                 | 0                     |
| $u = -0.317102 + 1.228990I$<br>$a = -1.384350 + 0.052888I$<br>$b = 0.683499 + 0.023809I$ | $-6.26076 - 3.02281I$                 | 0                     |
| $u = -0.317102 - 1.228990I$<br>$a = -1.384350 - 0.052888I$<br>$b = 0.683499 - 0.023809I$ | $-6.26076 + 3.02281I$                 | 0                     |

| Solutions to $I_1^u$        | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = 0.543168 + 1.157210I$  |                                       |            |
| $a = 0.422446 + 0.532579I$  | $-3.60234 + 12.75860I$                | 0          |
| $b = 0.110553 - 0.147833I$  |                                       |            |
| $u = 0.543168 - 1.157210I$  |                                       |            |
| $a = 0.422446 - 0.532579I$  | $-3.60234 - 12.75860I$                | 0          |
| $b = 0.110553 + 0.147833I$  |                                       |            |
| $u = -0.223301 + 1.259190I$ |                                       |            |
| $a = 2.60164 + 1.04394I$    | $-2.84117 + 10.66610I$                | 0          |
| $b = -1.54079 - 0.98551I$   |                                       |            |
| $u = -0.223301 - 1.259190I$ |                                       |            |
| $a = 2.60164 - 1.04394I$    | $-2.84117 - 10.66610I$                | 0          |
| $b = -1.54079 + 0.98551I$   |                                       |            |
| $u = 0.558687 + 1.153750I$  |                                       |            |
| $a = -1.26378 - 2.21148I$   | $3.27547 + 12.28210I$                 | 0          |
| $b = 1.96014 + 0.19747I$    |                                       |            |
| $u = 0.558687 - 1.153750I$  |                                       |            |
| $a = -1.26378 + 2.21148I$   | $3.27547 - 12.28210I$                 | 0          |
| $b = 1.96014 - 0.19747I$    |                                       |            |
| $u = -0.443636 + 1.204070I$ |                                       |            |
| $a = -0.843315 - 0.160289I$ | $-5.66176 - 2.88998I$                 | 0          |
| $b = 0.309435 + 0.592095I$  |                                       |            |
| $u = -0.443636 - 1.204070I$ |                                       |            |
| $a = -0.843315 + 0.160289I$ | $-5.66176 + 2.88998I$                 | 0          |
| $b = 0.309435 - 0.592095I$  |                                       |            |
| $u = -0.568214 + 1.152690I$ |                                       |            |
| $a = -0.04655 + 2.88528I$   | $-3.42925 - 13.20540I$                | 0          |
| $b = 1.64677 - 1.11729I$    |                                       |            |
| $u = -0.568214 - 1.152690I$ |                                       |            |
| $a = -0.04655 - 2.88528I$   | $-3.42925 + 13.20540I$                | 0          |
| $b = 1.64677 + 1.11729I$    |                                       |            |



| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|--|---------------------------------------|-----------------------|
| $u = -0.249040 + 0.667944I$<br>$a = -2.87581 - 0.55560I$<br>$b = -0.301550 - 0.257994I$  | $4.41673 - 2.94301I$                  | $-7.72377 - 2.80983I$ |
| $u = -0.249040 - 0.667944I$<br>$a = -2.87581 + 0.55560I$<br>$b = -0.301550 + 0.257994I$  | $4.41673 + 2.94301I$                  | $-7.72377 + 2.80983I$ |
| $u = -0.449897 + 1.211370I$<br>$a = -0.489003 - 0.295317I$<br>$b = 0.318179 + 0.497734I$ | $-5.61132 - 2.98647I$                 | 0                     |
| $u = -0.449897 - 1.211370I$<br>$a = -0.489003 + 0.295317I$<br>$b = 0.318179 - 0.497734I$ | $-5.61132 + 2.98647I$                 | 0                     |
| $u = -0.467643 + 1.211860I$<br>$a = 0.070724 + 0.767974I$<br>$b = 0.395979 - 0.539772I$  | $-5.45282 - 6.02890I$                 | 0                     |
| $u = -0.467643 - 1.211860I$<br>$a = 0.070724 - 0.767974I$<br>$b = 0.395979 + 0.539772I$  | $-5.45282 + 6.02890I$                 | 0                     |
| $u = -0.348227 + 0.603564I$<br>$a = -1.85480 - 0.85300I$<br>$b = -1.92973 + 0.73724I$    | $1.33390 - 4.92038I$                  | $-2.96903 + 7.20510I$ |
| $u = -0.348227 - 0.603564I$<br>$a = -1.85480 + 0.85300I$<br>$b = -1.92973 - 0.73724I$    | $1.33390 + 4.92038I$                  | $-2.96903 - 7.20510I$ |
| $u = 0.656745 + 0.220774I$<br>$a = -0.95862 + 1.04655I$<br>$b = 0.203938 - 0.105601I$    | $-3.74502 - 1.20259I$                 | $-7.76392 + 5.48574I$ |
| $u = 0.656745 - 0.220774I$<br>$a = -0.95862 - 1.04655I$<br>$b = 0.203938 + 0.105601I$    | $-3.74502 + 1.20259I$                 | $-7.76392 - 5.48574I$ |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|--|---------------------------------------|-----------------------|
| $u = -0.416436 + 0.551040I$<br>$a = 0.55337 + 2.11407I$<br>$b = 0.806600 - 0.306418I$  | $-2.64830 - 0.66881I$                 | $1.13261 + 10.21227I$ |
| $u = -0.416436 - 0.551040I$<br>$a = 0.55337 - 2.11407I$<br>$b = 0.806600 + 0.306418I$  | $-2.64830 + 0.66881I$                 | $1.13261 - 10.21227I$ |
| $u = 0.669051 + 0.129996I$<br>$a = -0.086872 - 1.143820I$<br>$b = -1.67120 + 1.28658I$ | $0.10169 - 4.86501I$                  | $-6.23365 + 7.74181I$ |
| $u = 0.669051 - 0.129996I$<br>$a = -0.086872 + 1.143820I$<br>$b = -1.67120 - 1.28658I$ | $0.10169 + 4.86501I$                  | $-6.23365 - 7.74181I$ |
| $u = 0.579276 + 0.358982I$<br>$a = 1.350700 + 0.202255I$<br>$b = 0.869778 + 0.493481I$ | $5.17720 + 1.57032I$                  | $-1.58318 - 2.26362I$ |
| $u = 0.579276 - 0.358982I$<br>$a = 1.350700 - 0.202255I$<br>$b = 0.869778 - 0.493481I$ | $5.17720 - 1.57032I$                  | $-1.58318 + 2.26362I$ |
| $u = 0.644270 + 1.150770I$<br>$a = 0.08994 - 3.28212I$<br>$b = 1.70427 + 1.81284I$     | $-1.66120 + 9.45022I$                 | 0                     |
| $u = 0.644270 - 1.150770I$<br>$a = 0.08994 + 3.28212I$<br>$b = 1.70427 - 1.81284I$     | $-1.66120 - 9.45022I$                 | 0                     |
| $u = -0.593287 + 1.178580I$<br>$a = 0.26963 - 3.16414I$<br>$b = -1.83640 + 1.33864I$   | $-0.2864 - 19.5811I$                  | 0                     |
| $u = -0.593287 - 1.178580I$<br>$a = 0.26963 + 3.16414I$<br>$b = -1.83640 - 1.33864I$   | $-0.2864 + 19.5811I$                  | 0                     |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|--|---------------------------------------|-----------------------|
| $u = -0.561028 + 0.372602I$<br>$a = 0.343687 - 0.119766I$<br>$b = 1.52319 - 0.41698I$    | $-0.985320 - 0.794515I$               | $-7.89002 + 1.41192I$ |
| $u = -0.561028 - 0.372602I$<br>$a = 0.343687 + 0.119766I$<br>$b = 1.52319 + 0.41698I$    | $-0.985320 + 0.794515I$               | $-7.89002 - 1.41192I$ |
| $u = 0.562698 + 1.204090I$<br>$a = -0.33535 + 3.24093I$<br>$b = -1.23686 - 1.67317I$     | $-2.25908 + 6.69261I$                 | 0                     |
| $u = 0.562698 - 1.204090I$<br>$a = -0.33535 - 3.24093I$<br>$b = -1.23686 + 1.67317I$     | $-2.25908 - 6.69261I$                 | 0                     |
| $u = -0.436059 + 1.288710I$<br>$a = 0.879936 + 1.019690I$<br>$b = -0.177384 - 0.607356I$ | $-5.55889 - 6.39241I$                 | 0                     |
| $u = -0.436059 - 1.288710I$<br>$a = 0.879936 - 1.019690I$<br>$b = -0.177384 + 0.607356I$ | $-5.55889 + 6.39241I$                 | 0                     |
| $u = -0.494635 + 0.385298I$<br>$a = 1.25666 - 1.50464I$<br>$b = 0.467833 + 0.879146I$    | $5.37889 + 2.47470I$                  | $-4.33792 - 4.94559I$ |
| $u = -0.494635 - 0.385298I$<br>$a = 1.25666 + 1.50464I$<br>$b = 0.467833 - 0.879146I$    | $5.37889 - 2.47470I$                  | $-4.33792 + 4.94559I$ |
| $u = 0.241418 + 0.555776I$<br>$a = -1.05287 - 1.30742I$<br>$b = 0.71230 + 1.33021I$      | $-1.21452 + 2.10656I$                 | $-2.73296 - 4.39387I$ |
| $u = 0.241418 - 0.555776I$<br>$a = -1.05287 + 1.30742I$<br>$b = 0.71230 - 1.33021I$      | $-1.21452 - 2.10656I$                 | $-2.73296 + 4.39387I$ |

| Solutions to $I_1^u$       | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|----------------------------|---------------------------------------|-----------------------|
| $u = 0.445195 + 0.397840I$ | $-0.69479 - 1.62339I$                 | $-7.51539 - 1.89786I$ |
| $a = 1.044290 + 0.085184I$ |                                       |                       |
| $b = 1.43864 - 1.16421I$   |                                       |                       |
| $u = 0.445195 - 0.397840I$ | $-0.69479 + 1.62339I$                 | $-7.51539 + 1.89786I$ |
| $a = 1.044290 - 0.085184I$ |                                       |                       |
| $b = 1.43864 + 1.16421I$   |                                       |                       |
| $u = -0.458239$            | $-0.900948$                           | $-11.0700$            |
| $a = 0.601847$             |                                       |                       |
| $b = 0.560207$             |                                       |                       |

$$\langle -15u^{36} + 4u^{35} + \dots + b + 12, 3u^{36} - u^{35} + \dots + a + 4, u^{37} + 10u^{35} + \dots + 7u^2 + 1 \rangle$$

II.  $I_2^u =$

(i) Arc colorings

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

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

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

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

$$a_4 = \begin{pmatrix} -u^3 \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -3u^{36} + u^{35} + \dots - 4u - 4 \\ 15u^{36} - 4u^{35} + \dots + 20u - 12 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -6u^{36} + 3u^{35} + \dots + 69u^2 + 16 \\ -u^{36} - 9u^{34} + \dots - u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 15u^{36} + 2u^{35} + \dots + 15u - 9 \\ 7u^{36} + 2u^{35} + \dots + 8u + 3 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^{36} + 2u^{35} + \dots + 2u - 3 \\ 17u^{36} - 4u^{35} + \dots + 23u - 12 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 7u^{36} + 9u^{35} + \dots + 23u + 15 \\ 15u^{36} + 14u^{35} + \dots + 22u + 16 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 21u^{36} + 7u^{35} + \dots + 26u - 4 \\ -3u^{35} - 3u^{34} + \dots - 12u^2 - 3u \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes =  $-43u^{36} - 50u^{35} + \dots - 96u - 74$

(iv)  $u$ -Polynomials at the component

| Crossings | u-Polynomials at each crossing         |
|-----------|--|
| $c_1$     | $u^{37} - 20u^{36} + \dots - 14u + 1$  |
| $c_2$     | $u^{37} + 10u^{35} + \dots - 7u^2 - 1$ |
| $c_3$     | $u^{37} - 10u^{35} + \dots + 4u - 1$   |
| $c_4$     | $u^{37} - u^{36} + \dots - u + 1$      |
| $c_5$     | $u^{37} + 3u^{36} + \dots - 3u - 1$    |
| $c_6$     | $u^{37} + 2u^{35} + \dots - 16u^2 + 1$ |
| $c_7$     | $u^{37} + 10u^{35} + \dots + 7u^2 + 1$ |
| $c_8$     | $u^{37} - 3u^{36} + \dots - 3u + 1$    |
| $c_9$     | $u^{37} - 7u^{36} + \dots + 7u - 1$    |
| $c_{10}$  | $u^{37} + 8u^{31} + \dots - 2u + 1$    |
| $c_{11}$  | $u^{37} + u^{36} + \dots - u - 1$      |
| $c_{12}$  | $u^{37} + 7u^{36} + \dots + 7u + 1$    |





(v) Riley Polynomials at the component

| Crossings     | Riley Polynomials at each crossing     |
|---------------|--|
| $c_1$         | $y^{37} + 40y^{35} + \cdots + 6y - 1$  |
| $c_2, c_7$    | $y^{37} + 20y^{36} + \cdots - 14y - 1$ |
| $c_3$         | $y^{37} - 20y^{36} + \cdots - 24y - 1$ |
| $c_4, c_{11}$ | $y^{37} + 23y^{36} + \cdots - 21y - 1$ |
| $c_5, c_8$    | $y^{37} - 33y^{36} + \cdots + 29y - 1$ |
| $c_6$         | $y^{37} + 4y^{36} + \cdots + 32y - 1$  |
| $c_9, c_{12}$ | $y^{37} + 15y^{36} + \cdots - 23y - 1$ |
| $c_{10}$      | $y^{37} + 16y^{34} + \cdots + 30y - 1$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to $I_2^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape             |
|--|---------------------------------------|------------------------|
| $u = -0.952212 + 0.090311I$<br>$a = -0.104007 - 0.655366I$<br>$b = 0.208410 + 0.522362I$ | $-1.17932 + 0.96611I$                 | $0.27254 + 2.52102I$   |
| $u = -0.952212 - 0.090311I$<br>$a = -0.104007 + 0.655366I$<br>$b = 0.208410 - 0.522362I$ | $-1.17932 - 0.96611I$                 | $0.27254 - 2.52102I$   |
| $u = 0.319819 + 0.996719I$<br>$a = 2.65049 + 0.61977I$<br>$b = -1.59562 + 1.02330I$      | $-0.45140 - 2.56507I$                 | $-11.02853 + 5.16547I$ |
| $u = 0.319819 - 0.996719I$<br>$a = 2.65049 - 0.61977I$<br>$b = -1.59562 - 1.02330I$      | $-0.45140 + 2.56507I$                 | $-11.02853 - 5.16547I$ |
| $u = 0.740520 + 0.585878I$<br>$a = 0.663276 + 0.775081I$<br>$b = -2.40811 + 0.48918I$    | $3.15523 - 3.56081I$                  | $-4.03686 + 6.43106I$  |
| $u = 0.740520 - 0.585878I$<br>$a = 0.663276 - 0.775081I$<br>$b = -2.40811 - 0.48918I$    | $3.15523 + 3.56081I$                  | $-4.03686 - 6.43106I$  |
| $u = -0.416499 + 0.972612I$<br>$a = 0.88128 + 2.03607I$<br>$b = 0.595763 - 0.127531I$    | $3.64739 + 0.16584I$                  | $-2.88358 - 0.96832I$  |
| $u = -0.416499 - 0.972612I$<br>$a = 0.88128 - 2.03607I$<br>$b = 0.595763 + 0.127531I$    | $3.64739 - 0.16584I$                  | $-2.88358 + 0.96832I$  |
| $u = 0.831452 + 0.345027I$<br>$a = -0.429239 + 0.777863I$<br>$b = 1.66786 - 1.60998I$    | $0.47473 - 2.75973I$                  | $-5.24795 + 1.41911I$  |
| $u = 0.831452 - 0.345027I$<br>$a = -0.429239 - 0.777863I$<br>$b = 1.66786 + 1.60998I$    | $0.47473 + 2.75973I$                  | $-5.24795 - 1.41911I$  |

| Solutions to $I_2^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|---|---------------------------------------|-----------------------|
| $u = 0.458141 + 1.028050I$<br>$a = -0.869327 - 0.706073I$<br>$b = 1.51754 - 0.42557I$     | $-4.46888 + 3.15544I$                 | $-26.5881 - 4.0517I$  |
| $u = 0.458141 - 1.028050I$<br>$a = -0.869327 + 0.706073I$<br>$b = 1.51754 + 0.42557I$     | $-4.46888 - 3.15544I$                 | $-26.5881 + 4.0517I$  |
| $u = -0.566830 + 0.661005I$<br>$a = -1.332300 - 0.304883I$<br>$b = -0.626582 + 0.321553I$ | $5.59318 + 1.34355I$                  | $-3.36632 + 1.17381I$ |
| $u = -0.566830 - 0.661005I$<br>$a = -1.332300 + 0.304883I$<br>$b = -0.626582 - 0.321553I$ | $5.59318 - 1.34355I$                  | $-3.36632 - 1.17381I$ |
| $u = -0.538094 + 0.996131I$<br>$a = -0.69125 - 1.56159I$<br>$b = -0.415061 + 0.357911I$   | $4.51353 - 5.77883I$                  | $-3.50165 + 5.87210I$ |
| $u = -0.538094 - 0.996131I$<br>$a = -0.69125 + 1.56159I$<br>$b = -0.415061 - 0.357911I$   | $4.51353 + 5.77883I$                  | $-3.50165 - 5.87210I$ |
| $u = 0.342528 + 1.111330I$<br>$a = -2.97687 + 1.70899I$<br>$b = 1.10784 - 1.57583I$       | $-3.72281 + 0.02504I$                 | $-11.46828 + 0.I$     |
| $u = 0.342528 - 1.111330I$<br>$a = -2.97687 - 1.70899I$<br>$b = 1.10784 + 1.57583I$       | $-3.72281 - 0.02504I$                 | $-11.46828 + 0.I$     |
| $u = 0.196424 + 0.810077I$<br>$a = -0.071376 + 1.329080I$<br>$b = -1.34633 - 0.67267I$    | $0.42538 + 4.86711I$                  | $-12.3973 - 6.8417I$  |
| $u = 0.196424 - 0.810077I$<br>$a = -0.071376 - 1.329080I$<br>$b = -1.34633 + 0.67267I$    | $0.42538 - 4.86711I$                  | $-12.3973 + 6.8417I$  |

| Solutions to $I_2^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape             |
|---|---------------------------------------|------------------------|
| $u = -0.340917 + 0.742877I$<br>$a = 2.68410 + 1.31226I$<br>$b = 0.653111 - 0.504954I$     | $4.51247 - 3.44104I$                  | $-4.31509 + 12.23106I$ |
| $u = -0.340917 - 0.742877I$<br>$a = 2.68410 - 1.31226I$<br>$b = 0.653111 + 0.504954I$     | $4.51247 + 3.44104I$                  | $-4.31509 - 12.23106I$ |
| $u = 0.604712 + 1.052990I$<br>$a = 0.79485 + 2.85404I$<br>$b = -2.42269 - 0.96027I$       | $1.68369 + 8.70603I$                  | $-6.3309 - 12.6711I$   |
| $u = 0.604712 - 1.052990I$<br>$a = 0.79485 - 2.85404I$<br>$b = -2.42269 + 0.96027I$       | $1.68369 - 8.70603I$                  | $-6.3309 + 12.6711I$   |
| $u = -0.453958 + 1.153080I$<br>$a = -0.514883 + 0.395782I$<br>$b = -0.033508 - 0.222257I$ | $-6.72491 - 4.05872I$                 | $-14.5319 + 3.6037I$   |
| $u = -0.453958 - 1.153080I$<br>$a = -0.514883 - 0.395782I$<br>$b = -0.033508 + 0.222257I$ | $-6.72491 + 4.05872I$                 | $-14.5319 - 3.6037I$   |
| $u = 0.087285 + 0.738567I$<br>$a = -1.156660 - 0.183774I$<br>$b = 0.76662 + 1.20592I$     | $-1.79055 + 1.99497I$                 | $-17.4589 - 1.8946I$   |
| $u = 0.087285 - 0.738567I$<br>$a = -1.156660 + 0.183774I$<br>$b = 0.76662 - 1.20592I$     | $-1.79055 - 1.99497I$                 | $-17.4589 + 1.8946I$   |
| $u = 0.552094 + 1.164430I$<br>$a = 0.33534 - 3.50860I$<br>$b = 1.44777 + 1.73879I$        | $-2.09762 + 7.91089I$                 | $-7.69267 - 6.67021I$  |
| $u = 0.552094 - 1.164430I$<br>$a = 0.33534 + 3.50860I$<br>$b = 1.44777 - 1.73879I$        | $-2.09762 - 7.91089I$                 | $-7.69267 + 6.67021I$  |

| Solutions to $I_2^u$        | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|-----------------------------|---------------------------------------|-----------------------|
| $u = -0.401506 + 1.227270I$ |                                       |                       |
| $a = -0.240017 + 0.236492I$ | $-5.42342 - 3.43861I$                 | $-6.21564 + 7.48749I$ |
| $b = 0.295463 - 0.357562I$  |                                       |                       |
| $u = -0.401506 - 1.227270I$ |                                       |                       |
| $a = -0.240017 - 0.236492I$ | $-5.42342 + 3.43861I$                 | $-6.21564 - 7.48749I$ |
| $b = 0.295463 + 0.357562I$  |                                       |                       |
| $u = -0.467703 + 1.250830I$ |                                       |                       |
| $a = 0.566324 + 0.107385I$  | $-4.92900 - 5.98878I$                 | 0                     |
| $b = -0.429435 - 0.045642I$ |                                       |                       |
| $u = -0.467703 - 1.250830I$ |                                       |                       |
| $a = 0.566324 - 0.107385I$  | $-4.92900 + 5.98878I$                 | 0                     |
| $b = -0.429435 + 0.045642I$ |                                       |                       |
| $u = 0.313789 + 0.564788I$  |                                       |                       |
| $a = 0.43343 - 2.21104I$    | $-2.91040 + 0.42992I$                 | $-16.9096 + 4.9698I$  |
| $b = 0.891963 + 0.402792I$  |                                       |                       |
| $u = 0.313789 - 0.564788I$  |                                       |                       |
| $a = 0.43343 + 2.21104I$    | $-2.91040 - 0.42992I$                 | $-16.9096 - 4.9698I$  |
| $b = 0.891963 - 0.402792I$  |                                       |                       |
| $u = -0.618091$             |                                       |                       |
| $a = -1.24632$              | $-3.64366$                            | $-10.0020$            |
| $b = 0.249980$              |                                       |                       |

### III. u-Polynomials

| Crossings | u-Polynomials at each crossing  |
|-----------|---|
| $c_1$     | $(u^{37} - 20u^{36} + \dots - 14u + 1)(u^{153} + 77u^{152} + \dots - 1548u - 121)$                  |
| $c_2$     | $(u^{37} + 10u^{35} + \dots - 7u^2 - 1)(u^{153} + u^{152} + \dots + 28u + 11)$                      |
| $c_3$     | $(u^{37} - 10u^{35} + \dots + 4u - 1)$<br>$\cdot (u^{153} - u^{152} + \dots + 13334880u + 1770791)$ |
| $c_4$     | $(u^{37} - u^{36} + \dots - u + 1)(u^{153} + 2u^{152} + \dots + 3u + 1)$                            |
| $c_5$     | $(u^{37} + 3u^{36} + \dots - 3u - 1)(u^{153} - 50u^{151} + \dots + 8395u + 10331)$                  |
| $c_6$     | $(u^{37} + 2u^{35} + \dots - 16u^2 + 1)(u^{153} + u^{152} + \dots + 869544u + 253007)$              |
| $c_7$     | $(u^{37} + 10u^{35} + \dots + 7u^2 + 1)(u^{153} + u^{152} + \dots + 28u + 11)$                      |
| $c_8$     | $(u^{37} - 3u^{36} + \dots - 3u + 1)(u^{153} - 50u^{151} + \dots + 8395u + 10331)$                  |
| $c_9$     | $(u^{37} - 7u^{36} + \dots + 7u - 1)(u^{153} - 4u^{152} + \dots - 52195u + 4961)$                   |
| $c_{10}$  | $(u^{37} + 8u^{31} + \dots - 2u + 1)(u^{153} - u^{152} + \dots + 35046u + 9439)$                    |
| $c_{11}$  | $(u^{37} + u^{36} + \dots - u - 1)(u^{153} + 2u^{152} + \dots + 3u + 1)$                            |
| $c_{12}$  | $(u^{37} + 7u^{36} + \dots + 7u + 1)(u^{153} - 4u^{152} + \dots - 52195u + 4961)$                   |

#### IV. Riley Polynomials

| Crossings     | Riley Polynomials at each crossing  |
|---------------|---|
| $c_1$         | $(y^{37} + 40y^{35} + \dots + 6y - 1)(y^{153} + 5y^{152} + \dots - 286508y - 14641)$                                |
| $c_2, c_7$    | $(y^{37} + 20y^{36} + \dots - 14y - 1)(y^{153} + 77y^{152} + \dots - 1548y - 121)$                                  |
| $c_3$         | $(y^{37} - 20y^{36} + \dots - 24y - 1)$<br>$\cdot (y^{153} - 67y^{152} + \dots - 141584742282518y - 3135700765681)$ |
| $c_4, c_{11}$ | $(y^{37} + 23y^{36} + \dots - 21y - 1)(y^{153} + 84y^{152} + \dots - 39y - 1)$                                      |
| $c_5, c_8$    | $(y^{37} - 33y^{36} + \dots + 29y - 1)$<br>$\cdot (y^{153} - 100y^{152} + \dots + 4473444915y - 106729561)$         |
| $c_6$         | $(y^{37} + 4y^{36} + \dots + 32y - 1)$<br>$\cdot (y^{153} + 25y^{152} + \dots - 1962648262454y - 64012542049)$      |
| $c_9, c_{12}$ | $(y^{37} + 15y^{36} + \dots - 23y - 1)$<br>$\cdot (y^{153} + 80y^{152} + \dots - 798994097y - 24611521)$            |
| $c_{10}$      | $(y^{37} + 16y^{34} + \dots + 30y - 1)$<br>$\cdot (y^{153} + 17y^{152} + \dots - 7057634132y - 89094721)$           |