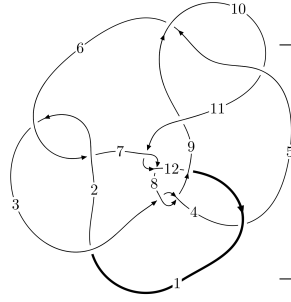
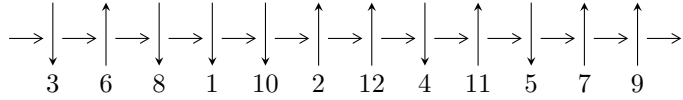


12a<sub>0342</sub> (K12a<sub>0342</sub>)



A knot diagram<sup>1</sup>

**Linearized knot diagram**



**Solving Sequence**

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

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

$$I_1^u = \langle -1.20197 \times 10^{404} u^{155} - 1.98407 \times 10^{404} u^{154} + \dots + 1.03297 \times 10^{404} b - 1.24809 \times 10^{407}, \\ - 2.63389 \times 10^{406} u^{155} + 8.44260 \times 10^{406} u^{154} + \dots + 7.75764 \times 10^{406} a + 6.28696 \times 10^{409}, \\ u^{156} + u^{155} + \dots - 643u + 751 \rangle$$

$$I_2^u = \langle -7283u^{37} + 6235u^{36} + \dots + 995b - 2491, 3092u^{37} - 2046u^{36} + \dots + 995a + 12148, \\ u^{38} + 12u^{36} + \dots + 2u + 1 \rangle$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 194 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.

$$\text{I. } I_1^u = \langle -1.20 \times 10^{404} u^{155} - 1.98 \times 10^{404} u^{154} + \dots + 1.03 \times 10^{404} b - 1.25 \times 10^{407}, -2.63 \times 10^{406} u^{155} + 8.44 \times 10^{406} u^{154} + \dots + 7.76 \times 10^{406} a + 6.29 \times 10^{409}, u^{156} + u^{155} + \dots - 643u + 751 \rangle$$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.339523u^{155} - 1.08830u^{154} + \dots + 1312.04u - 810.422 \\ 1.16361u^{155} + 1.92074u^{154} + \dots - 990.348u + 1208.25 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 0.887263u^{155} - 0.732362u^{154} + \dots + 1494.76u - 674.462 \\ 0.803609u^{155} + 1.94703u^{154} + \dots - 1525.03u + 1352.30 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.240562u^{155} + 0.684041u^{154} + \dots - 624.185u + 655.447 \\ -0.222710u^{155} - 1.77408u^{154} + \dots + 1850.31u - 1384.20 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1.58683u^{155} - 2.09974u^{154} + \dots + 4195.43u - 1967.02 \\ -0.323186u^{155} + 3.07800u^{154} + \dots - 4460.22u + 2614.13 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.724223u^{155} - 4.21579u^{154} + \dots + 3923.98u - 2938.41 \\ 0.518971u^{155} + 2.43169u^{154} + \dots - 2514.80u + 1834.96 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.363334u^{155} - 0.0490247u^{154} + \dots + 370.041u + 97.1690 \\ 0.721342u^{155} + 2.37469u^{154} + \dots - 1453.60u + 1335.56 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0.428023u^{155} - 1.47511u^{154} + \dots + 2752.95u - 1358.47 \\ 0.845539u^{155} + 0.990339u^{154} + \dots - 279.843u + 478.958 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $-6.61247u^{155} - 7.18823u^{154} + \dots - 439.660u - 3074.15$

(iv) u-Polynomials at the component

| Crossings     | u-Polynomials at each crossing                        |
|---------------|---|
| $c_1$         | $u^{156} + 68u^{155} + \dots + 586213058u + 32137561$ |
| $c_2, c_6$    | $u^{156} - 2u^{155} + \dots - 17042u + 5669$          |
| $c_3, c_8$    | $u^{156} - u^{155} + \dots + 6147u + 2449$            |
| $c_4$         | $u^{156} - 4u^{155} + \dots - 513066u + 23269$        |
| $c_5, c_{10}$ | $u^{156} - u^{155} + \dots + 643u + 751$              |
| $c_7, c_{11}$ | $u^{156} - 3u^{155} + \dots + 107845u + 85523$        |
| $c_9$         | $u^{156} - 77u^{155} + \dots - 10171145u + 564001$    |
| $c_{12}$      | $u^{156} + 9u^{155} + \dots - 1045u + 521$            |

(v) Riley Polynomials at the component

| Crossings     | Riley Polynomials at each crossing                                    |
|---------------|---|
| $c_1$         | $y^{156} + 60y^{155} + \dots + 29158613325391790y + 1032822827028721$ |
| $c_2, c_6$    | $y^{156} + 68y^{155} + \dots + 586213058y + 32137561$                 |
| $c_3, c_8$    | $y^{156} - 83y^{155} + \dots - 131376593y + 5997601$                  |
| $c_4$         | $y^{156} - 20y^{155} + \dots - 25116154598y + 541446361$              |
| $c_5, c_{10}$ | $y^{156} + 77y^{155} + \dots + 10171145y + 564001$                    |
| $c_7, c_{11}$ | $y^{156} - 105y^{155} + \dots + 830770663883y + 7314183529$           |
| $c_9$         | $y^{156} + 25y^{155} + \dots + 20263498622645y + 318097128001$        |
| $c_{12}$      | $y^{156} + 11y^{155} + \dots + 19725051y + 271441$                    |

(vi) Complex Volumes and Cusp Shapes

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = 0.314686 + 0.948049I$<br>$a = -1.122900 + 0.399488I$<br>$b = -0.05478 - 1.90960I$   | $4.50020 + 0.21846I$                  | 0          |
| $u = 0.314686 - 0.948049I$<br>$a = -1.122900 - 0.399488I$<br>$b = -0.05478 + 1.90960I$   | $4.50020 - 0.21846I$                  | 0          |
| $u = -0.170790 + 0.987084I$<br>$a = 0.633623 - 1.049930I$<br>$b = -0.357628 + 0.104624I$ | $3.20120 - 1.52428I$                  | 0          |
| $u = -0.170790 - 0.987084I$<br>$a = 0.633623 + 1.049930I$<br>$b = -0.357628 - 0.104624I$ | $3.20120 + 1.52428I$                  | 0          |
| $u = -0.389580 + 0.925758I$<br>$a = -3.06881 + 1.42393I$<br>$b = 2.74803 + 0.41625I$     | $-0.36759 - 1.52334I$                 | 0          |
| $u = -0.389580 - 0.925758I$<br>$a = -3.06881 - 1.42393I$<br>$b = 2.74803 - 0.41625I$     | $-0.36759 + 1.52334I$                 | 0          |
| $u = 0.764967 + 0.665148I$<br>$a = 0.30131 + 1.97652I$<br>$b = -1.77763 - 0.59009I$      | $-8.04521 - 0.38455I$                 | 0          |
| $u = 0.764967 - 0.665148I$<br>$a = 0.30131 - 1.97652I$<br>$b = -1.77763 + 0.59009I$      | $-8.04521 + 0.38455I$                 | 0          |
| $u = -0.287570 + 0.978275I$<br>$a = 1.141850 - 0.391800I$<br>$b = -0.447530 - 1.222970I$ | $4.40725 - 3.47807I$                  | 0          |
| $u = -0.287570 - 0.978275I$<br>$a = 1.141850 + 0.391800I$<br>$b = -0.447530 + 1.222970I$ | $4.40725 + 3.47807I$                  | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.379406 + 0.964078I$<br>$a = 2.31237 + 1.11954I$<br>$b = -2.06980 - 0.13247I$         | $2.40104 - 3.09117I$                  | 0          |
| $u = 0.379406 - 0.964078I$<br>$a = 2.31237 - 1.11954I$<br>$b = -2.06980 + 0.13247I$         | $2.40104 + 3.09117I$                  | 0          |
| $u = 0.168715 + 0.947032I$<br>$a = -0.609414 - 0.921753I$<br>$b = 0.157383 + 0.470877I$     | $1.28269 - 2.51191I$                  | 0          |
| $u = 0.168715 - 0.947032I$<br>$a = -0.609414 + 0.921753I$<br>$b = 0.157383 - 0.470877I$     | $1.28269 + 2.51191I$                  | 0          |
| $u = -0.620529 + 0.727479I$<br>$a = 0.916688 + 0.299057I$<br>$b = 0.575110 - 0.684533I$     | $-2.52818 + 5.31514I$                 | 0          |
| $u = -0.620529 - 0.727479I$<br>$a = 0.916688 - 0.299057I$<br>$b = 0.575110 + 0.684533I$     | $-2.52818 - 5.31514I$                 | 0          |
| $u = -0.192813 + 1.026250I$<br>$a = -0.1149880 - 0.0450683I$<br>$b = -0.211794 + 1.044400I$ | $-1.75492 - 0.21945I$                 | 0          |
| $u = -0.192813 - 1.026250I$<br>$a = -0.1149880 + 0.0450683I$<br>$b = -0.211794 - 1.044400I$ | $-1.75492 + 0.21945I$                 | 0          |
| $u = -0.967091 + 0.396088I$<br>$a = -0.07366 + 1.60101I$<br>$b = 1.82974 + 0.15178I$        | $-2.07204 - 13.90080I$                | 0          |
| $u = -0.967091 - 0.396088I$<br>$a = -0.07366 - 1.60101I$<br>$b = 1.82974 - 0.15178I$        | $-2.07204 + 13.90080I$                | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.310213 + 0.900109I$<br>$a = -1.06413 + 1.58543I$<br>$b = 1.97565 - 1.89639I$      | $-2.43039 - 4.42948I$                 | 0          |
| $u = -0.310213 - 0.900109I$<br>$a = -1.06413 - 1.58543I$<br>$b = 1.97565 + 1.89639I$      | $-2.43039 + 4.42948I$                 | 0          |
| $u = -0.522391 + 0.912570I$<br>$a = -0.575948 + 0.066149I$<br>$b = -0.085719 + 1.120830I$ | $-1.95927 - 0.77778I$                 | 0          |
| $u = -0.522391 - 0.912570I$<br>$a = -0.575948 - 0.066149I$<br>$b = -0.085719 - 1.120830I$ | $-1.95927 + 0.77778I$                 | 0          |
| $u = -0.909221 + 0.259472I$<br>$a = 0.123111 + 0.685530I$<br>$b = -0.316398 + 0.008844I$  | $2.89929 - 2.34324I$                  | 0          |
| $u = -0.909221 - 0.259472I$<br>$a = 0.123111 - 0.685530I$<br>$b = -0.316398 - 0.008844I$  | $2.89929 + 2.34324I$                  | 0          |
| $u = 0.327121 + 0.886426I$<br>$a = 0.21564 + 2.15420I$<br>$b = -1.73820 - 2.40526I$       | $2.00818 + 0.26275I$                  | 0          |
| $u = 0.327121 - 0.886426I$<br>$a = 0.21564 - 2.15420I$<br>$b = -1.73820 + 2.40526I$       | $2.00818 - 0.26275I$                  | 0          |
| $u = 0.761910 + 0.558313I$<br>$a = -0.99544 - 1.87431I$<br>$b = 1.142060 - 0.268267I$     | $-1.75544 + 0.37427I$                 | 0          |
| $u = 0.761910 - 0.558313I$<br>$a = -0.99544 + 1.87431I$<br>$b = 1.142060 + 0.268267I$     | $-1.75544 - 0.37427I$                 | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.369426 + 0.994086I$<br>$a = -1.96669 + 1.41932I$<br>$b = 2.20930 - 0.98738I$    | $-1.96143 + 7.05234I$                 | 0          |
| $u = -0.369426 - 0.994086I$<br>$a = -1.96669 - 1.41932I$<br>$b = 2.20930 + 0.98738I$    | $-1.96143 - 7.05234I$                 | 0          |
| $u = -0.231301 + 0.909026I$<br>$a = 0.172950 - 0.756205I$<br>$b = 0.513443 - 0.335586I$ | $4.28323 - 1.07875I$                  | 0          |
| $u = -0.231301 - 0.909026I$<br>$a = 0.172950 + 0.756205I$<br>$b = 0.513443 + 0.335586I$ | $4.28323 + 1.07875I$                  | 0          |
| $u = 0.873648 + 0.340491I$<br>$a = -0.346265 + 0.707821I$<br>$b = 0.281624 - 0.173512I$ | $0.13196 + 8.09309I$                  | 0          |
| $u = 0.873648 - 0.340491I$<br>$a = -0.346265 - 0.707821I$<br>$b = 0.281624 + 0.173512I$ | $0.13196 - 8.09309I$                  | 0          |
| $u = -0.368759 + 0.861294I$<br>$a = -0.21879 + 3.23453I$<br>$b = 2.37621 - 2.72280I$    | $-0.61701 + 4.67868I$                 | 0          |
| $u = -0.368759 - 0.861294I$<br>$a = -0.21879 - 3.23453I$<br>$b = 2.37621 + 2.72280I$    | $-0.61701 - 4.67868I$                 | 0          |
| $u = 0.324965 + 1.012440I$<br>$a = 1.44767 - 0.05934I$<br>$b = -0.494335 + 0.177695I$   | $4.69177 - 2.40977I$                  | 0          |
| $u = 0.324965 - 1.012440I$<br>$a = 1.44767 + 0.05934I$<br>$b = -0.494335 - 0.177695I$   | $4.69177 + 2.40977I$                  | 0          |



| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.277751 + 0.894534I$<br>$a = 0.272369 - 0.204315I$<br>$b = -1.045410 - 0.821220I$ | $3.59555 + 3.72788I$                  | 0          |
| $u = 0.277751 - 0.894534I$<br>$a = 0.272369 + 0.204315I$<br>$b = -1.045410 + 0.821220I$ | $3.59555 - 3.72788I$                  | 0          |
| $u = 1.015980 + 0.348748I$<br>$a = -0.03654 + 1.55044I$<br>$b = -1.73438 + 0.30252I$    | $1.04423 + 7.45505I$                  | 0          |
| $u = 1.015980 - 0.348748I$<br>$a = -0.03654 - 1.55044I$<br>$b = -1.73438 - 0.30252I$    | $1.04423 - 7.45505I$                  | 0          |
| $u = 0.214175 + 1.057270I$<br>$a = -0.817825 - 1.130120I$<br>$b = 0.895341 - 0.109395I$ | $-0.96779 + 5.37139I$                 | 0          |
| $u = 0.214175 - 1.057270I$<br>$a = -0.817825 + 1.130120I$<br>$b = 0.895341 + 0.109395I$ | $-0.96779 - 5.37139I$                 | 0          |
| $u = 0.834858 + 0.385886I$<br>$a = 0.504327 - 1.072800I$<br>$b = 1.30683 + 0.76592I$    | $-5.07291 - 2.27519I$                 | 0          |
| $u = 0.834858 - 0.385886I$<br>$a = 0.504327 + 1.072800I$<br>$b = 1.30683 - 0.76592I$    | $-5.07291 + 2.27519I$                 | 0          |
| $u = 0.392121 + 1.007210I$<br>$a = 0.884957 + 1.045460I$<br>$b = -0.452494 - 1.041260I$ | $4.37259 - 6.31285I$                  | 0          |
| $u = 0.392121 - 1.007210I$<br>$a = 0.884957 - 1.045460I$<br>$b = -0.452494 + 1.041260I$ | $4.37259 + 6.31285I$                  | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.763974 + 0.483070I$<br>$a = -0.265987 - 1.249780I$<br>$b = -1.54989 + 0.74973I$     | $-1.51002 - 2.90487I$                 | 0          |
| $u = -0.763974 - 0.483070I$<br>$a = -0.265987 + 1.249780I$<br>$b = -1.54989 - 0.74973I$     | $-1.51002 + 2.90487I$                 | 0          |
| $u = -0.699502 + 0.847403I$<br>$a = -0.73555 + 1.79135I$<br>$b = 2.22784 - 0.54310I$        | $-4.02999 + 2.67079I$                 | 0          |
| $u = -0.699502 - 0.847403I$<br>$a = -0.73555 - 1.79135I$<br>$b = 2.22784 + 0.54310I$        | $-4.02999 - 2.67079I$                 | 0          |
| $u = -0.702976 + 0.547108I$<br>$a = 1.02977 - 2.07419I$<br>$b = -1.314950 + 0.139898I$      | $-6.14075 - 5.00203I$                 | 0          |
| $u = -0.702976 - 0.547108I$<br>$a = 1.02977 + 2.07419I$<br>$b = -1.314950 - 0.139898I$      | $-6.14075 + 5.00203I$                 | 0          |
| $u = -0.321932 + 1.061480I$<br>$a = -0.833564 - 0.350555I$<br>$b = -0.0635669 + 0.0950970I$ | $4.76986 + 5.15135I$                  | 0          |
| $u = -0.321932 - 1.061480I$<br>$a = -0.833564 + 0.350555I$<br>$b = -0.0635669 - 0.0950970I$ | $4.76986 - 5.15135I$                  | 0          |
| $u = 0.683523 + 0.554488I$<br>$a = -0.99602 - 1.73710I$<br>$b = 1.73993 + 0.19544I$         | $-0.22944 + 4.39648I$                 | 0          |
| $u = 0.683523 - 0.554488I$<br>$a = -0.99602 + 1.73710I$<br>$b = 1.73993 - 0.19544I$         | $-0.22944 - 4.39648I$                 | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.411070 + 1.041850I$<br>$a = -0.270836 + 0.721017I$<br>$b = -0.196903 - 0.838389I$ | $5.49577 + 3.46244I$                  | 0          |
| $u = -0.411070 - 1.041850I$<br>$a = -0.270836 - 0.721017I$<br>$b = -0.196903 + 0.838389I$ | $5.49577 - 3.46244I$                  | 0          |
| $u = -0.685378 + 0.540273I$<br>$a = 0.70519 - 1.42825I$<br>$b = -1.65080 + 0.27536I$      | $0.20529 - 1.95269I$                  | 0          |
| $u = -0.685378 - 0.540273I$<br>$a = 0.70519 + 1.42825I$<br>$b = -1.65080 - 0.27536I$      | $0.20529 + 1.95269I$                  | 0          |
| $u = 0.519236 + 1.018860I$<br>$a = 0.026199 + 0.606770I$<br>$b = 0.056375 + 0.196424I$    | $1.34667 - 2.83958I$                  | 0          |
| $u = 0.519236 - 1.018860I$<br>$a = 0.026199 - 0.606770I$<br>$b = 0.056375 - 0.196424I$    | $1.34667 + 2.83958I$                  | 0          |
| $u = 0.631143 + 0.576314I$<br>$a = -0.77796 - 2.45089I$<br>$b = 2.16384 + 0.11659I$       | $1.24304 + 1.23867I$                  | 0          |
| $u = 0.631143 - 0.576314I$<br>$a = -0.77796 + 2.45089I$<br>$b = 2.16384 - 0.11659I$       | $1.24304 - 1.23867I$                  | 0          |
| $u = 0.730028 + 0.426011I$<br>$a = 0.46514 - 1.41810I$<br>$b = 1.62643 + 0.90017I$        | $-5.43928 + 7.39195I$                 | 0          |
| $u = 0.730028 - 0.426011I$<br>$a = 0.46514 + 1.41810I$<br>$b = 1.62643 - 0.90017I$        | $-5.43928 - 7.39195I$                 | 0          |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = 0.477199 + 1.051930I$<br>$a = -0.503885 + 0.648213I$<br>$b = 0.894322 - 0.618879I$  | $3.70748 - 0.15166I$                  | 0          |
| $u = 0.477199 - 1.051930I$<br>$a = -0.503885 - 0.648213I$<br>$b = 0.894322 + 0.618879I$  | $3.70748 + 0.15166I$                  | 0          |
| $u = -0.716845 + 0.444011I$<br>$a = 0.63771 - 1.97825I$<br>$b = -0.602540 + 0.140499I$   | $-5.59556 + 5.07298I$                 | 0          |
| $u = -0.716845 - 0.444011I$<br>$a = 0.63771 + 1.97825I$<br>$b = -0.602540 - 0.140499I$   | $-5.59556 - 5.07298I$                 | 0          |
| $u = -0.807265 + 0.242487I$<br>$a = 0.22546 + 1.85523I$<br>$b = 1.257880 - 0.118049I$    | $-5.93107 - 3.05587I$                 | 0          |
| $u = -0.807265 - 0.242487I$<br>$a = 0.22546 - 1.85523I$<br>$b = 1.257880 + 0.118049I$    | $-5.93107 + 3.05587I$                 | 0          |
| $u = -0.439023 + 1.071930I$<br>$a = 0.168515 + 0.509331I$<br>$b = -0.544178 - 0.663350I$ | $5.25817 + 3.39113I$                  | 0          |
| $u = -0.439023 - 1.071930I$<br>$a = 0.168515 - 0.509331I$<br>$b = -0.544178 + 0.663350I$ | $5.25817 - 3.39113I$                  | 0          |
| $u = -0.557443 + 1.020580I$<br>$a = -0.158651 + 0.981541I$<br>$b = 0.455205 - 0.018837I$ | $-1.80516 + 7.01140I$                 | 0          |
| $u = -0.557443 - 1.020580I$<br>$a = -0.158651 - 0.981541I$<br>$b = 0.455205 + 0.018837I$ | $-1.80516 - 7.01140I$                 | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.577409 + 1.025130I$<br>$a = -1.23261 - 2.41380I$<br>$b = 3.25283 + 1.24785I$       | $2.60603 - 6.01858I$                  | 0          |
| $u = 0.577409 - 1.025130I$<br>$a = -1.23261 + 2.41380I$<br>$b = 3.25283 - 1.24785I$       | $2.60603 + 6.01858I$                  | 0          |
| $u = -0.626104 + 0.534752I$<br>$a = 0.0056920 - 0.0550585I$<br>$b = 0.722902 + 0.343109I$ | $-3.23822 - 2.34344I$                 | 0          |
| $u = -0.626104 - 0.534752I$<br>$a = 0.0056920 + 0.0550585I$<br>$b = 0.722902 - 0.343109I$ | $-3.23822 + 2.34344I$                 | 0          |
| $u = -0.625453 + 0.519765I$<br>$a = 0.16231 - 2.25984I$<br>$b = -2.07324 + 0.50021I$      | $0.86345 - 4.89693I$                  | 0          |
| $u = -0.625453 - 0.519765I$<br>$a = 0.16231 + 2.25984I$<br>$b = -2.07324 - 0.50021I$      | $0.86345 + 4.89693I$                  | 0          |
| $u = -0.572499 + 1.042580I$<br>$a = 1.67007 - 2.15788I$<br>$b = -3.19405 + 0.62334I$      | $2.41575 + 9.65210I$                  | 0          |
| $u = -0.572499 - 1.042580I$<br>$a = 1.67007 + 2.15788I$<br>$b = -3.19405 - 0.62334I$      | $2.41575 - 9.65210I$                  | 0          |
| $u = 0.595624 + 1.031600I$<br>$a = -1.16682 - 1.91428I$<br>$b = 2.50507 + 1.26030I$       | $1.19711 - 9.36105I$                  | 0          |
| $u = 0.595624 - 1.031600I$<br>$a = -1.16682 + 1.91428I$<br>$b = 2.50507 - 1.26030I$       | $1.19711 + 9.36105I$                  | 0          |

| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.593322 + 1.034280I$<br>$a = 0.92240 - 1.48547I$<br>$b = -2.48652 + 1.39183I$    | $-4.67986 + 9.99352I$                 | 0          |
| $u = -0.593322 - 1.034280I$<br>$a = 0.92240 + 1.48547I$<br>$b = -2.48652 - 1.39183I$    | $-4.67986 - 9.99352I$                 | 0          |
| $u = -0.598676 + 1.039030I$<br>$a = 1.18922 - 1.79510I$<br>$b = -2.27709 + 0.95338I$    | $1.68875 + 6.93868I$                  | 0          |
| $u = -0.598676 - 1.039030I$<br>$a = 1.18922 + 1.79510I$<br>$b = -2.27709 - 0.95338I$    | $1.68875 - 6.93868I$                  | 0          |
| $u = 0.610139 + 1.033340I$<br>$a = -0.50259 - 1.54405I$<br>$b = 2.35284 + 1.62725I$     | $-0.32346 - 5.55789I$                 | 0          |
| $u = 0.610139 - 1.033340I$<br>$a = -0.50259 + 1.54405I$<br>$b = 2.35284 - 1.62725I$     | $-0.32346 + 5.55789I$                 | 0          |
| $u = 0.695051 + 0.983936I$<br>$a = 1.07951 + 1.32265I$<br>$b = -2.44418 - 0.32764I$     | $-7.10538 - 5.12757I$                 | 0          |
| $u = 0.695051 - 0.983936I$<br>$a = 1.07951 - 1.32265I$<br>$b = -2.44418 + 0.32764I$     | $-7.10538 + 5.12757I$                 | 0          |
| $u = 0.522378 + 1.089810I$<br>$a = -0.667224 + 0.732118I$<br>$b = 0.477953 - 0.724821I$ | $3.26152 - 4.43525I$                  | 0          |
| $u = 0.522378 - 1.089810I$<br>$a = -0.667224 - 0.732118I$<br>$b = 0.477953 + 0.724821I$ | $3.26152 + 4.43525I$                  | 0          |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = 0.450080 + 0.634804I$<br>$a = -0.490028 - 0.317649I$<br>$b = -0.215712 + 0.122955I$ | $-0.030131 - 1.277460I$               | 0          |
| $u = 0.450080 - 0.634804I$<br>$a = -0.490028 + 0.317649I$<br>$b = -0.215712 - 0.122955I$ | $-0.030131 + 1.277460I$               | 0          |
| $u = 0.985195 + 0.723490I$<br>$a = 0.25473 + 1.55530I$<br>$b = -1.59947 + 0.05949I$      | $-4.15642 - 8.44858I$                 | 0          |
| $u = 0.985195 - 0.723490I$<br>$a = 0.25473 - 1.55530I$<br>$b = -1.59947 - 0.05949I$      | $-4.15642 + 8.44858I$                 | 0          |
| $u = -0.874131 + 0.866056I$<br>$a = -0.252868 + 1.194610I$<br>$b = 2.19417 - 0.29826I$   | $-3.01919 + 4.59139I$                 | 0          |
| $u = -0.874131 - 0.866056I$<br>$a = -0.252868 - 1.194610I$<br>$b = 2.19417 + 0.29826I$   | $-3.01919 - 4.59139I$                 | 0          |
| $u = 0.281693 + 1.200670I$<br>$a = -0.412752 - 0.605345I$<br>$b = 0.880298 - 0.251427I$  | $-0.07942 - 5.37671I$                 | 0          |
| $u = 0.281693 - 1.200670I$<br>$a = -0.412752 + 0.605345I$<br>$b = 0.880298 + 0.251427I$  | $-0.07942 + 5.37671I$                 | 0          |
| $u = -0.605742 + 1.076930I$<br>$a = 1.59470 - 1.28539I$<br>$b = -2.29188 - 0.06672I$     | $0.27308 + 8.09103I$                  | 0          |
| $u = -0.605742 - 1.076930I$<br>$a = 1.59470 + 1.28539I$<br>$b = -2.29188 + 0.06672I$     | $0.27308 - 8.09103I$                  | 0          |

| Solutions to $I_1^u$        | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = -0.520380 + 1.121920I$ |                                       |            |
| $a = 0.955421 + 0.480931I$  | $3.38361 + 2.22304I$                  | 0          |
| $b = -0.812013 - 0.820838I$ |                                       |            |
| $u = -0.520380 - 1.121920I$ |                                       |            |
| $a = 0.955421 - 0.480931I$  | $3.38361 - 2.22304I$                  | 0          |
| $b = -0.812013 + 0.820838I$ |                                       |            |
| $u = 0.585855 + 1.090390I$  |                                       |            |
| $a = -1.91646 - 1.21893I$   | $-3.47988 - 12.42280I$                | 0          |
| $b = 2.53111 - 0.33787I$    |                                       |            |
| $u = 0.585855 - 1.090390I$  |                                       |            |
| $a = -1.91646 + 1.21893I$   | $-3.47988 + 12.42280I$                | 0          |
| $b = 2.53111 + 0.33787I$    |                                       |            |
| $u = -0.704138 + 0.290929I$ |                                       |            |
| $a = -0.757040 - 0.812459I$ | $0.94200 + 2.44909I$                  | 0          |
| $b = -0.176420 + 0.892429I$ |                                       |            |
| $u = -0.704138 - 0.290929I$ |                                       |            |
| $a = -0.757040 + 0.812459I$ | $0.94200 - 2.44909I$                  | 0          |
| $b = -0.176420 - 0.892429I$ |                                       |            |
| $u = -0.606842 + 1.088630I$ |                                       |            |
| $a = 0.384191 - 0.926406I$  | $-3.68759 + 0.00634I$                 | 0          |
| $b = -1.91223 + 1.42145I$   |                                       |            |
| $u = -0.606842 - 1.088630I$ |                                       |            |
| $a = 0.384191 + 0.926406I$  | $-3.68759 - 0.00634I$                 | 0          |
| $b = -1.91223 - 1.42145I$   |                                       |            |
| $u = 0.510897 + 1.138500I$  |                                       |            |
| $a = -0.303510 - 0.600633I$ | $-0.00303 - 3.85262I$                 | 0          |
| $b = 0.291658 + 0.208675I$  |                                       |            |
| $u = 0.510897 - 1.138500I$  |                                       |            |
| $a = -0.303510 + 0.600633I$ | $-0.00303 + 3.85262I$                 | 0          |
| $b = 0.291658 - 0.208675I$  |                                       |            |



| Solutions to $I_1^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.654555 + 0.332436I$<br>$a = 0.591153 - 0.783342I$<br>$b = -0.135768 + 0.815860I$ | $1.075190 - 0.122962I$                | 0          |
| $u = 0.654555 - 0.332436I$<br>$a = 0.591153 + 0.783342I$<br>$b = -0.135768 - 0.815860I$ | $1.075190 + 0.122962I$                | 0          |
| $u = 0.655003 + 0.318049I$<br>$a = -0.284407 + 0.105268I$<br>$b = 0.591088 + 0.006799I$ | $-2.42606 - 0.70127I$                 | 0          |
| $u = 0.655003 - 0.318049I$<br>$a = -0.284407 - 0.105268I$<br>$b = 0.591088 - 0.006799I$ | $-2.42606 + 0.70127I$                 | 0          |
| $u = -0.910786 + 0.891962I$<br>$a = -0.48384 + 1.60604I$<br>$b = 2.16993 - 0.00669I$    | $-2.96834 + 1.90597I$                 | 0          |
| $u = -0.910786 - 0.891962I$<br>$a = -0.48384 - 1.60604I$<br>$b = 2.16993 + 0.00669I$    | $-2.96834 - 1.90597I$                 | 0          |
| $u = 0.176825 + 1.271730I$<br>$a = -0.857305 - 0.471239I$<br>$b = 0.732823 + 0.974096I$ | $5.56436 + 4.82435I$                  | 0          |
| $u = 0.176825 - 1.271730I$<br>$a = -0.857305 + 0.471239I$<br>$b = 0.732823 - 0.974096I$ | $5.56436 - 4.82435I$                  | 0          |
| $u = 0.634061 + 1.125180I$<br>$a = -1.45622 - 0.86675I$<br>$b = 2.00233 - 0.38221I$     | $-2.89210 - 3.18493I$                 | 0          |
| $u = 0.634061 - 1.125180I$<br>$a = -1.45622 + 0.86675I$<br>$b = 2.00233 + 0.38221I$     | $-2.89210 + 3.18493I$                 | 0          |

| Solutions to $I_1^u$        | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = 0.609232 + 1.156980I$  |                                       |            |
| $a = 0.226479 - 0.590302I$  | $2.57819 - 13.54640I$                 | 0          |
| $b = -0.417868 + 0.431707I$ |                                       |            |
| $u = 0.609232 - 1.156980I$  |                                       |            |
| $a = 0.226479 + 0.590302I$  | $2.57819 + 13.54640I$                 | 0          |
| $b = -0.417868 - 0.431707I$ |                                       |            |
| $u = -0.597251 + 1.185190I$ |                                       |            |
| $a = -0.115502 - 0.444116I$ | $5.65845 + 7.80630I$                  | 0          |
| $b = 0.368514 + 0.158468I$  |                                       |            |
| $u = -0.597251 - 1.185190I$ |                                       |            |
| $a = -0.115502 + 0.444116I$ | $5.65845 - 7.80630I$                  | 0          |
| $b = 0.368514 - 0.158468I$  |                                       |            |
| $u = -0.546174 + 1.224470I$ |                                       |            |
| $a = -1.50124 + 1.29771I$   | $-2.96174 + 8.13583I$                 | 0          |
| $b = 3.05551 - 0.68186I$    |                                       |            |
| $u = -0.546174 - 1.224470I$ |                                       |            |
| $a = -1.50124 - 1.29771I$   | $-2.96174 - 8.13583I$                 | 0          |
| $b = 3.05551 + 0.68186I$    |                                       |            |
| $u = -0.657062 + 1.177770I$ |                                       |            |
| $a = -1.36747 + 1.58923I$   | $0.3293 + 19.8011I$                   | 0          |
| $b = 3.06183 - 0.58267I$    |                                       |            |
| $u = -0.657062 - 1.177770I$ |                                       |            |
| $a = -1.36747 - 1.58923I$   | $0.3293 - 19.8011I$                   | 0          |
| $b = 3.06183 + 0.58267I$    |                                       |            |
| $u = -0.100808 + 1.351960I$ |                                       |            |
| $a = -0.533792 - 0.214465I$ | $4.23693 - 10.48220I$                 | 0          |
| $b = 0.23273 + 1.57802I$    |                                       |            |
| $u = -0.100808 - 1.351960I$ |                                       |            |
| $a = -0.533792 + 0.214465I$ | $4.23693 + 10.48220I$                 | 0          |
| $b = 0.23273 - 1.57802I$    |                                       |            |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape           |
|--|---------------------------------------|----------------------|
| $u = 0.881084 + 1.036760I$<br>$a = 0.438040 + 0.883985I$<br>$b = -2.20326 - 0.37361I$  | $-3.23204 + 1.72984I$                 | 0                    |
| $u = 0.881084 - 1.036760I$<br>$a = 0.438040 - 0.883985I$<br>$b = -2.20326 + 0.37361I$  | $-3.23204 - 1.72984I$                 | 0                    |
| $u = 0.658091 + 1.205700I$<br>$a = 1.31663 + 1.50523I$<br>$b = -3.07784 - 0.56855I$    | $3.67860 - 13.47280I$                 | 0                    |
| $u = 0.658091 - 1.205700I$<br>$a = 1.31663 - 1.50523I$<br>$b = -3.07784 + 0.56855I$    | $3.67860 + 13.47280I$                 | 0                    |
| $u = -0.253746 + 1.376080I$<br>$a = 0.788847 - 0.488417I$<br>$b = -1.11170 + 1.02007I$ | $8.25173 + 1.72796I$                  | 0                    |
| $u = -0.253746 - 1.376080I$<br>$a = 0.788847 + 0.488417I$<br>$b = -1.11170 - 1.02007I$ | $8.25173 - 1.72796I$                  | 0                    |
| $u = 0.510191 + 0.275897I$<br>$a = 1.02470 - 1.69924I$<br>$b = -0.160387 + 0.570498I$  | $1.61176 - 3.82565I$                  | $0.67831 + 6.25245I$ |
| $u = 0.510191 - 0.275897I$<br>$a = 1.02470 + 1.69924I$<br>$b = -0.160387 - 0.570498I$  | $1.61176 + 3.82565I$                  | $0.67831 - 6.25245I$ |
| $u = -0.546569 + 0.128274I$<br>$a = -1.49865 - 0.80037I$<br>$b = 0.075574 + 0.289173I$ | $2.70783 + 0.36374I$                  | $3.83104 + 1.53290I$ |
| $u = -0.546569 - 0.128274I$<br>$a = -1.49865 + 0.80037I$<br>$b = 0.075574 - 0.289173I$ | $2.70783 - 0.36374I$                  | $3.83104 - 1.53290I$ |

| Solutions to $I_1^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|--|---------------------------------------|-----------------------|
| $u = 0.18825 + 1.46944I$<br>$a = 0.454513 - 0.375637I$<br>$b = -0.15234 + 2.01768I$      | $7.36728 + 3.23128I$                  | 0                     |
| $u = 0.18825 - 1.46944I$<br>$a = 0.454513 + 0.375637I$<br>$b = -0.15234 - 2.01768I$      | $7.36728 - 3.23128I$                  | 0                     |
| $u = 0.02911 + 1.48434I$<br>$a = 1.168710 + 0.198616I$<br>$b = -2.23509 - 1.22613I$      | $5.52859 - 1.48937I$                  | 0                     |
| $u = 0.02911 - 1.48434I$<br>$a = 1.168710 - 0.198616I$<br>$b = -2.23509 + 1.22613I$      | $5.52859 + 1.48937I$                  | 0                     |
| $u = 0.382604 + 0.286600I$<br>$a = -0.729730 - 0.769814I$<br>$b = -0.245728 + 0.455420I$ | $-0.184437 - 1.162580I$               | $-3.08681 + 5.07810I$ |
| $u = 0.382604 - 0.286600I$<br>$a = -0.729730 + 0.769814I$<br>$b = -0.245728 - 0.455420I$ | $-0.184437 + 1.162580I$               | $-3.08681 - 5.07810I$ |

$$\text{II. } I_2^u = \langle -7283u^{37} + 6235u^{36} + \dots + 995b - 2491, 3092u^{37} - 2046u^{36} + \dots + 995a + 12148, u^{38} + 12u^{36} + \dots + 2u + 1 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_5 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_2 &= \begin{pmatrix} -3.10754u^{37} + 2.05628u^{36} + \dots - 17.0472u - 12.2090 \\ 7.31960u^{37} - 6.26633u^{36} + \dots + 11.9628u + 2.50352 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 1 \\ u^2 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -2.07437u^{37} - 2.67136u^{36} + \dots - 4.07940u - 7.64925 \\ 8.25930u^{37} + 1.98392u^{36} + \dots + 20.3849u + 7.23116 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 7.86734u^{37} + 1.91055u^{36} + \dots + 41.1286u - 1.23920 \\ 0.215075u^{37} + 7.88744u^{36} + \dots + 6.09447u + 9.41809 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{12} &= \begin{pmatrix} 15.1417u^{37} + 2.78191u^{36} + \dots - 5.59196u - 4.98995 \\ 1.24623u^{37} - 5.77186u^{36} + \dots - 15.7236u - 6.30452 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 16.1417u^{37} + 2.78191u^{36} + \dots - 5.59196u - 4.98995 \\ 0.246231u^{37} - 5.77186u^{36} + \dots - 17.7236u - 6.30452 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -12.1759u^{37} + 9.97990u^{36} + \dots + 65.2312u + 31.7889 \\ 7.32864u^{37} + 9.02613u^{36} + \dots + 23.4995u + 4.87437 \end{pmatrix} \\ a_9 &= \begin{pmatrix} -u^3 \\ u^3 + u \end{pmatrix} \\ a_8 &= \begin{pmatrix} -2.94573u^{37} - 1.24523u^{36} + \dots + 21.2201u + 5.22513 \\ 7.80402u^{37} + 5.46332u^{36} + \dots + 15.3719u + 5.76482 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = 1

$$\text{(iii) Cusp Shapes} = \frac{311}{995}u^{37} + \frac{33803}{995}u^{36} + \dots + \frac{120606}{995}u + \frac{13535}{199}$$

(iv)  $u$ -Polynomials at the component

| Crossings | u-Polynomials at each crossing         |
|-----------|--|
| $c_1$     | $u^{38} - 19u^{37} + \dots - 23u + 1$  |
| $c_2$     | $u^{38} - u^{37} + \dots - u + 1$      |
| $c_3$     | $u^{38} - 8u^{36} + \dots - 2u + 1$    |
| $c_4$     | $u^{38} + 7u^{37} + \dots + 7u + 1$    |
| $c_5$     | $u^{38} + 12u^{36} + \dots + 2u + 1$   |
| $c_6$     | $u^{38} + u^{37} + \dots + u + 1$      |
| $c_7$     | $u^{38} - 2u^{37} + \dots - 14u^2 + 1$ |
| $c_8$     | $u^{38} - 8u^{36} + \dots + 2u + 1$    |
| $c_9$     | $u^{38} + 24u^{37} + \dots + 26u + 1$  |
| $c_{10}$  | $u^{38} + 12u^{36} + \dots - 2u + 1$   |
| $c_{11}$  | $u^{38} + 2u^{37} + \dots - 14u^2 + 1$ |
| $c_{12}$  | $u^{38} - 2u^{37} + \dots + 10u + 1$   |





(v) Riley Polynomials at the component

| Crossings     | Riley Polynomials at each crossing     |
|---------------|--|
| $c_1$         | $y^{38} + 19y^{37} + \cdots + 3y + 1$  |
| $c_2, c_6$    | $y^{38} + 19y^{37} + \cdots + 23y + 1$ |
| $c_3, c_8$    | $y^{38} - 16y^{37} + \cdots - 32y + 1$ |
| $c_4$         | $y^{38} - y^{37} + \cdots + 19y + 1$   |
| $c_5, c_{10}$ | $y^{38} + 24y^{37} + \cdots + 26y + 1$ |
| $c_7, c_{11}$ | $y^{38} - 34y^{37} + \cdots - 28y + 1$ |
| $c_9$         | $y^{38} - 32y^{36} + \cdots - 38y + 1$ |
| $c_{12}$      | $y^{38} - 2y^{37} + \cdots - 40y + 1$  |

(vi) Complex Volumes and Cusp Shapes

| Solutions to $I_2^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|---|---------------------------------------|-----------------------|
| $u = 0.346633 + 0.913206I$<br>$a = -0.239791 - 0.510182I$<br>$b = -0.424762 - 0.773960I$  | $3.48133 + 3.00418I$                  | $-0.07411 + 2.12856I$ |
| $u = 0.346633 - 0.913206I$<br>$a = -0.239791 + 0.510182I$<br>$b = -0.424762 + 0.773960I$  | $3.48133 - 3.00418I$                  | $-0.07411 - 2.12856I$ |
| $u = 0.301513 + 0.914943I$<br>$a = 0.732917 + 0.423678I$<br>$b = 0.102967 - 0.753120I$    | $3.41062 - 5.71924I$                  | $-0.72914 + 7.89995I$ |
| $u = 0.301513 - 0.914943I$<br>$a = 0.732917 - 0.423678I$<br>$b = 0.102967 + 0.753120I$    | $3.41062 + 5.71924I$                  | $-0.72914 - 7.89995I$ |
| $u = -0.733903 + 0.761750I$<br>$a = -0.86783 + 1.25552I$<br>$b = 1.168020 - 0.189941I$    | $-5.11553 + 6.68417I$                 | $-4.19613 - 6.96120I$ |
| $u = -0.733903 - 0.761750I$<br>$a = -0.86783 - 1.25552I$<br>$b = 1.168020 + 0.189941I$    | $-5.11553 - 6.68417I$                 | $-4.19613 + 6.96120I$ |
| $u = 0.692411 + 0.628096I$<br>$a = -0.76820 - 1.59903I$<br>$b = 1.95207 + 0.24126I$       | $0.41456 + 3.20402I$                  | $-0.72082 - 2.63545I$ |
| $u = 0.692411 - 0.628096I$<br>$a = -0.76820 + 1.59903I$<br>$b = 1.95207 - 0.24126I$       | $0.41456 - 3.20402I$                  | $-0.72082 + 2.63545I$ |
| $u = -0.405760 + 1.013140I$<br>$a = -0.604304 + 0.119948I$<br>$b = -0.229560 - 0.210902I$ | $4.55898 + 3.61942I$                  | $1.30393 - 4.94313I$  |
| $u = -0.405760 - 1.013140I$<br>$a = -0.604304 - 0.119948I$<br>$b = -0.229560 + 0.210902I$ | $4.55898 - 3.61942I$                  | $1.30393 + 4.94313I$  |

| Solutions to $I_2^u$        | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|-----------------------------|---------------------------------------|-----------------------|
| $u = 0.316501 + 1.083920I$  |                                       |                       |
| $a = 0.20343 + 1.52675I$    | $0.71744 - 4.93871I$                  | $5.28229 + 3.82588I$  |
| $b = -1.000670 - 0.920320I$ |                                       |                       |
| $u = 0.316501 - 1.083920I$  |                                       |                       |
| $a = 0.20343 - 1.52675I$    | $0.71744 + 4.93871I$                  | $5.28229 - 3.82588I$  |
| $b = -1.000670 + 0.920320I$ |                                       |                       |
| $u = 0.784167 + 0.841255I$  |                                       |                       |
| $a = -0.13311 + 1.69915I$   | $-3.74428 - 4.78087I$                 | $-8.45889 + 5.85278I$ |
| $b = -2.40917 - 1.11192I$   |                                       |                       |
| $u = 0.784167 - 0.841255I$  |                                       |                       |
| $a = -0.13311 - 1.69915I$   | $-3.74428 + 4.78087I$                 | $-8.45889 - 5.85278I$ |
| $b = -2.40917 + 1.11192I$   |                                       |                       |
| $u = -0.270191 + 0.786977I$ |                                       |                       |
| $a = 0.830494 - 0.598475I$  | $3.51053 - 0.69885I$                  | $-2.05567 - 2.41427I$ |
| $b = 0.131868 - 0.840401I$  |                                       |                       |
| $u = -0.270191 - 0.786977I$ |                                       |                       |
| $a = 0.830494 + 0.598475I$  | $3.51053 + 0.69885I$                  | $-2.05567 + 2.41427I$ |
| $b = 0.131868 + 0.840401I$  |                                       |                       |
| $u = 0.602124 + 1.003030I$  |                                       |                       |
| $a = -1.20083 - 2.04407I$   | $1.55396 - 8.20858I$                  | $0. + 7.20942I$       |
| $b = 2.52189 + 0.99851I$    |                                       |                       |
| $u = 0.602124 - 1.003030I$  |                                       |                       |
| $a = -1.20083 + 2.04407I$   | $1.55396 + 8.20858I$                  | $0. - 7.20942I$       |
| $b = 2.52189 - 0.99851I$    |                                       |                       |
| $u = -0.439660 + 1.095730I$ |                                       |                       |
| $a = 1.81719 - 1.68910I$    | $-1.76589 + 8.07111I$                 | $1.68233 - 10.53606I$ |
| $b = -3.01576 + 1.14116I$   |                                       |                       |
| $u = -0.439660 - 1.095730I$ |                                       |                       |
| $a = 1.81719 + 1.68910I$    | $-1.76589 - 8.07111I$                 | $1.68233 + 10.53606I$ |
| $b = -3.01576 - 1.14116I$   |                                       |                       |

| Solutions to $I_2^u$   | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape            |
|--|---------------------------------------|-----------------------|
| $u = -0.503608 + 1.077910I$<br>$a = 0.954334 + 0.352535I$<br>$b = -1.001150 - 0.857931I$ | $3.76237 + 2.98497I$                  | $3.83010 - 4.26044I$  |
| $u = -0.503608 - 1.077910I$<br>$a = 0.954334 - 0.352535I$<br>$b = -1.001150 + 0.857931I$ | $3.76237 - 2.98497I$                  | $3.83010 + 4.26044I$  |
| $u = 0.228552 + 0.738188I$<br>$a = 2.50537 - 0.49257I$<br>$b = -1.21116 + 1.68755I$      | $-0.66638 + 2.56401I$                 | $-1.12291 - 4.70623I$ |
| $u = 0.228552 - 0.738188I$<br>$a = 2.50537 + 0.49257I$<br>$b = -1.21116 - 1.68755I$      | $-0.66638 - 2.56401I$                 | $-1.12291 + 4.70623I$ |
| $u = 0.812457 + 0.921922I$<br>$a = 1.03497 + 1.43564I$<br>$b = -2.11344 + 0.45923I$      | $-3.50761 - 1.19591I$                 | $-6.34432 - 2.08353I$ |
| $u = 0.812457 - 0.921922I$<br>$a = 1.03497 - 1.43564I$<br>$b = -2.11344 - 0.45923I$      | $-3.50761 + 1.19591I$                 | $-6.34432 + 2.08353I$ |
| $u = -0.355743 + 0.679655I$<br>$a = 1.60153 - 2.39187I$<br>$b = -2.02823 + 1.25785I$     | $-3.33747 - 4.69234I$                 | $-6.27818 + 4.28854I$ |
| $u = -0.355743 - 0.679655I$<br>$a = 1.60153 + 2.39187I$<br>$b = -2.02823 - 1.25785I$     | $-3.33747 + 4.69234I$                 | $-6.27818 - 4.28854I$ |
| $u = -0.759379 + 0.994661I$<br>$a = -0.160025 + 0.962962I$<br>$b = 1.80915 - 1.19487I$   | $-4.40408 - 0.99838I$                 | $-7.00268 + 0.I$      |
| $u = -0.759379 - 0.994661I$<br>$a = -0.160025 - 0.962962I$<br>$b = 1.80915 + 1.19487I$   | $-4.40408 + 0.99838I$                 | $-7.00268 + 0.I$      |

| Solutions to $I_2^u$  | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape           |
|---|---------------------------------------|----------------------|
| $u = -0.587859 + 0.355353I$<br>$a = -1.03266 - 1.18007I$<br>$b = -0.208703 + 0.879426I$ | $1.69614 + 1.35708I$                  | $0.61288 - 2.76121I$ |
| $u = -0.587859 - 0.355353I$<br>$a = -1.03266 + 1.18007I$<br>$b = -0.208703 - 0.879426I$ | $1.69614 - 1.35708I$                  | $0.61288 + 2.76121I$ |
| $u = 0.008225 + 1.396310I$<br>$a = -0.581533 + 0.388919I$<br>$b = 0.49580 - 1.64255I$   | $7.31275 + 2.46224I$                  | 0                    |
| $u = 0.008225 - 1.396310I$<br>$a = -0.581533 - 0.388919I$<br>$b = 0.49580 + 1.64255I$   | $7.31275 - 2.46224I$                  | 0                    |
| $u = 0.02154 + 1.45038I$<br>$a = -1.265650 - 0.113040I$<br>$b = 2.31036 + 1.03438I$     | $5.64774 - 1.52204I$                  | 0                    |
| $u = 0.02154 - 1.45038I$<br>$a = -1.265650 + 0.113040I$<br>$b = 2.31036 - 1.03438I$     | $5.64774 + 1.52204I$                  | 0                    |
| $u = -0.058020 + 0.433386I$<br>$a = -2.32631 - 2.17616I$<br>$b = 0.65045 + 1.35245I$    | $1.27923 + 1.49890I$                  | $1.46933 - 3.64562I$ |
| $u = -0.058020 - 0.433386I$<br>$a = -2.32631 + 2.17616I$<br>$b = 0.65045 - 1.35245I$    | $1.27923 - 1.49890I$                  | $1.46933 + 3.64562I$ |

### III. u-Polynomials

| Crossings | u-Polynomials at each crossing   |
|-----------|--|
| $c_1$     | $(u^{38} - 19u^{37} + \dots - 23u + 1)$<br>$\cdot (u^{156} + 68u^{155} + \dots + 586213058u + 32137561)$ |
| $c_2$     | $(u^{38} - u^{37} + \dots - u + 1)(u^{156} - 2u^{155} + \dots - 17042u + 5669)$                          |
| $c_3$     | $(u^{38} - 8u^{36} + \dots - 2u + 1)(u^{156} - u^{155} + \dots + 6147u + 2449)$                          |
| $c_4$     | $(u^{38} + 7u^{37} + \dots + 7u + 1)(u^{156} - 4u^{155} + \dots - 513066u + 23269)$                      |
| $c_5$     | $(u^{38} + 12u^{36} + \dots + 2u + 1)(u^{156} - u^{155} + \dots + 643u + 751)$                           |
| $c_6$     | $(u^{38} + u^{37} + \dots + u + 1)(u^{156} - 2u^{155} + \dots - 17042u + 5669)$                          |
| $c_7$     | $(u^{38} - 2u^{37} + \dots - 14u^2 + 1)(u^{156} - 3u^{155} + \dots + 107845u + 85523)$                   |
| $c_8$     | $(u^{38} - 8u^{36} + \dots + 2u + 1)(u^{156} - u^{155} + \dots + 6147u + 2449)$                          |
| $c_9$     | $(u^{38} + 24u^{37} + \dots + 26u + 1)$<br>$\cdot (u^{156} - 77u^{155} + \dots - 10171145u + 564001)$    |
| $c_{10}$  | $(u^{38} + 12u^{36} + \dots - 2u + 1)(u^{156} - u^{155} + \dots + 643u + 751)$                           |
| $c_{11}$  | $(u^{38} + 2u^{37} + \dots - 14u^2 + 1)(u^{156} - 3u^{155} + \dots + 107845u + 85523)$                   |
| $c_{12}$  | $(u^{38} - 2u^{37} + \dots + 10u + 1)(u^{156} + 9u^{155} + \dots - 1045u + 521)$                         |

#### IV. Riley Polynomials

| Crossings     | Riley Polynomials at each crossing  |
|---------------|---|
| $c_1$         | $(y^{38} + 19y^{37} + \dots + 3y + 1)$<br>$\cdot (y^{156} + 60y^{155} + \dots + 29158613325391790y + 1032822827028721)$ |
| $c_2, c_6$    | $(y^{38} + 19y^{37} + \dots + 23y + 1)$<br>$\cdot (y^{156} + 68y^{155} + \dots + 586213058y + 32137561)$                |
| $c_3, c_8$    | $(y^{38} - 16y^{37} + \dots - 32y + 1)$<br>$\cdot (y^{156} - 83y^{155} + \dots - 131376593y + 5997601)$                 |
| $c_4$         | $(y^{38} - y^{37} + \dots + 19y + 1)$<br>$\cdot (y^{156} - 20y^{155} + \dots - 25116154598y + 541446361)$               |
| $c_5, c_{10}$ | $(y^{38} + 24y^{37} + \dots + 26y + 1)$<br>$\cdot (y^{156} + 77y^{155} + \dots + 10171145y + 564001)$                   |
| $c_7, c_{11}$ | $(y^{38} - 34y^{37} + \dots - 28y + 1)$<br>$\cdot (y^{156} - 105y^{155} + \dots + 830770663883y + 7314183529)$          |
| $c_9$         | $(y^{38} - 32y^{36} + \dots - 38y + 1)$<br>$\cdot (y^{156} + 25y^{155} + \dots + 20263498622645y + 318097128001)$       |
| $c_{12}$      | $(y^{38} - 2y^{37} + \dots - 40y + 1)$<br>$\cdot (y^{156} + 11y^{155} + \dots + 19725051y + 271441)$                    |