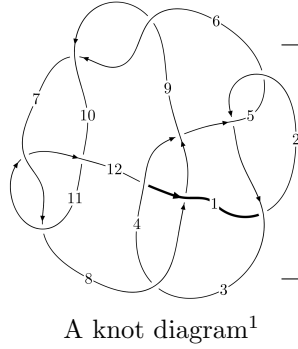
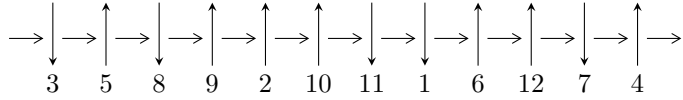


12a₀₁₃₇ (K12a₀₁₃₇)



Linearized knot diagram



Solving Sequence

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

Ideals for irreducible components² of X_{par}

$$I_1^u = \langle 6.13816 \times 10^{191} u^{110} - 1.13429 \times 10^{193} u^{109} + \dots + 2.24718 \times 10^{193} b - 3.38769 \times 10^{193}, \\ - 1.81134 \times 10^{193} u^{110} + 6.26196 \times 10^{193} u^{109} + \dots + 2.24718 \times 10^{193} a + 3.37392 \times 10^{193}, \\ u^{111} - 3u^{110} + \dots - 8u + 1 \rangle$$

$$I_2^u = \langle b - 2, a - 1, u^2 + u + 1 \rangle$$

$$I_3^u = \langle b + 1, a + u + 1, u^2 + u + 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 115 representations.

¹The 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>).

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

$$\mathbf{I. } J_1^u = \langle 6.14 \times 10^{191} u^{110} - 1.13 \times 10^{193} u^{109} + \dots + 2.25 \times 10^{193} b - 3.39 \times 10^{193}, -1.81 \times 10^{193} u^{110} + 6.26 \times 10^{193} u^{109} + \dots + 2.25 \times 10^{193} a + 3.37 \times 10^{193}, u^{111} - 3u^{110} + \dots - 8u + 1 \rangle$$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.806049u^{110} - 2.78659u^{109} + \dots + 32.2491u - 1.50140 \\ -0.0273149u^{110} + 0.504759u^{109} + \dots - 8.15785u + 1.50753 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1.23473u^{110} - 4.63145u^{109} + \dots + 39.4124u - 2.29265 \\ 0.401363u^{110} - 1.34010u^{109} + \dots - 0.994453u + 0.716275 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.344800u^{110} + 2.01151u^{109} + \dots - 9.75297u - 2.65220 \\ -0.941826u^{110} + 2.82073u^{109} + \dots - 2.64014u + 0.726247 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^2 + 1 \\ -u^4 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.325295u^{110} - 1.05138u^{109} + \dots - 0.0877722u + 3.79641 \\ 0.344661u^{110} - 0.920101u^{109} + \dots - 2.58288u + 0.162347 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1.04968u^{110} - 3.66787u^{109} + \dots + 30.1172u - 0.718132 \\ 0.479923u^{110} - 1.04472u^{109} + \dots - 3.71313u + 0.942185 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.193835u^{110} + 0.246390u^{109} + \dots - 8.59881u + 2.39820 \\ 0.0697190u^{110} - 0.380589u^{109} + \dots + 1.11872u - 0.310933 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1.30011u^{110} - 2.29710u^{109} + \dots + 18.8682u + 0.678898 \\ -1.16327u^{110} + 3.92263u^{109} + \dots - 19.1527u + 3.07306 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $0.199727u^{110} - 1.12797u^{109} + \dots + 25.1841u - 1.58105$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|---------------|---|
| c_1 | $u^{111} + 41u^{110} + \dots - 12u - 1$ |
| c_2, c_5 | $u^{111} + 3u^{110} + \dots - 8u - 1$ |
| c_3 | $u^{111} - 2u^{110} + \dots + 128151u - 22181$ |
| c_4 | $u^{111} + 39u^{109} + \dots - 10571037u - 2188019$ |
| c_6, c_9 | $u^{111} - 3u^{110} + \dots + 3962u - 1217$ |
| c_7, c_{11} | $u^{111} + 3u^{110} + \dots + 2u - 1$ |
| c_8 | $u^{111} + 3u^{110} + \dots - 2u - 1$ |
| c_{10} | $u^{111} - 61u^{110} + \dots - 8u + 1$ |
| c_{12} | $u^{111} + 11u^{110} + \dots - 16u + 16$ |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|---------------|--|
| c_1 | $y^{111} + 61y^{110} + \dots - 2780y - 1$ |
| c_2, c_5 | $y^{111} + 41y^{110} + \dots - 12y - 1$ |
| c_3 | $y^{111} + 150y^{110} + \dots - 11615036801y - 491996761$ |
| c_4 | $y^{111} + 78y^{110} + \dots + 215220189102279y - 4787427144361$ |
| c_6, c_9 | $y^{111} - 99y^{110} + \dots - 22891192y - 1481089$ |
| c_7, c_{11} | $y^{111} + 61y^{110} + \dots - 8y - 1$ |
| c_8 | $y^{111} + 13y^{110} + \dots - 8y - 1$ |
| c_{10} | $y^{111} - 19y^{110} + \dots + 148y - 1$ |
| c_{12} | $y^{111} - 25y^{110} + \dots + 6272y - 256$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.151572 + 0.991463I$ $a = -0.888867 - 0.508229I$ $b = -1.66325 - 0.01061I$ | $-3.59561 - 0.34680I$ | 0 |
| $u = 0.151572 - 0.991463I$ $a = -0.888867 + 0.508229I$ $b = -1.66325 + 0.01061I$ | $-3.59561 + 0.34680I$ | 0 |
| $u = 0.258560 + 0.953606I$ $a = 0.820900 + 0.539762I$ $b = 1.79814 - 0.31279I$ | $-1.60150 + 4.05760I$ | 0 |
| $u = 0.258560 - 0.953606I$ $a = 0.820900 - 0.539762I$ $b = 1.79814 + 0.31279I$ | $-1.60150 - 4.05760I$ | 0 |
| $u = 0.700734 + 0.735786I$ $a = 0.388751 - 1.180800I$ $b = -0.545202 + 0.253821I$ | $9.12536 - 4.91085I$ | 0 |
| $u = 0.700734 - 0.735786I$ $a = 0.388751 + 1.180800I$ $b = -0.545202 - 0.253821I$ | $9.12536 + 4.91085I$ | 0 |
| $u = -0.452673 + 0.873202I$ $a = 2.34656 - 0.61539I$ $b = 2.78531 - 1.07755I$ | $0.001017 - 0.573653I$ | 0 |
| $u = -0.452673 - 0.873202I$ $a = 2.34656 + 0.61539I$ $b = 2.78531 + 1.07755I$ | $0.001017 + 0.573653I$ | 0 |
| $u = 0.574894 + 0.794669I$ $a = 0.401800 - 0.342049I$ $b = 1.84011 - 0.11929I$ | $0.66452 + 3.75930I$ | 0 |
| $u = 0.574894 - 0.794669I$ $a = 0.401800 + 0.342049I$ $b = 1.84011 + 0.11929I$ | $0.66452 - 3.75930I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = 0.762307 + 0.679648I$ | $5.76477 - 1.56136I$ | 0 |
| $a = 0.596090 - 0.841569I$ | | |
| $b = 0.707490 - 0.483429I$ | | |
| $u = 0.762307 - 0.679648I$ | $5.76477 + 1.56136I$ | 0 |
| $a = 0.596090 + 0.841569I$ | | |
| $b = 0.707490 + 0.483429I$ | | |
| $u = -0.503793 + 0.893374I$ | $0.29861 - 3.79341I$ | 0 |
| $a = -2.95406 + 1.43653I$ | | |
| $b = -3.62966 + 1.39140I$ | | |
| $u = -0.503793 - 0.893374I$ | $0.29861 + 3.79341I$ | 0 |
| $a = -2.95406 - 1.43653I$ | | |
| $b = -3.62966 - 1.39140I$ | | |
| $u = 0.682390 + 0.771033I$ | $5.68044 + 0.15489I$ | 0 |
| $a = -0.408080 + 1.072650I$ | | |
| $b = 0.360693 - 0.288234I$ | | |
| $u = 0.682390 - 0.771033I$ | $5.68044 - 0.15489I$ | 0 |
| $a = -0.408080 - 1.072650I$ | | |
| $b = 0.360693 + 0.288234I$ | | |
| $u = -0.591641 + 0.849125I$ | $6.39356 + 2.13485I$ | 0 |
| $a = 2.80917 - 1.82162I$ | | |
| $b = 3.46325 - 0.58936I$ | | |
| $u = -0.591641 - 0.849125I$ | $6.39356 - 2.13485I$ | 0 |
| $a = 2.80917 + 1.82162I$ | | |
| $b = 3.46325 + 0.58936I$ | | |
| $u = -0.574926 + 0.863175I$ | $2.81370 - 2.28141I$ | 0 |
| $a = -2.78033 + 1.84517I$ | | |
| $b = -3.49720 + 0.84587I$ | | |
| $u = -0.574926 - 0.863175I$ | $2.81370 + 2.28141I$ | 0 |
| $a = -2.78033 - 1.84517I$ | | |
| $b = -3.49720 - 0.84587I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.813992 + 0.499000I$ $a = 0.446497 - 1.221160I$ $b = 0.181652 + 0.047950I$ | $2.21997 - 7.60792I$ | 0 |
| $u = 0.813992 - 0.499000I$ $a = 0.446497 + 1.221160I$ $b = 0.181652 - 0.047950I$ | $2.21997 + 7.60792I$ | 0 |
| $u = -0.586237 + 0.879911I$ $a = 2.78417 - 1.86801I$ $b = 3.72891 - 0.83367I$ | $6.29471 - 6.78751I$ | 0 |
| $u = -0.586237 - 0.879911I$ $a = 2.78417 + 1.86801I$ $b = 3.72891 + 0.83367I$ | $6.29471 + 6.78751I$ | 0 |
| $u = -0.479587 + 0.810655I$ $a = -2.03914 + 1.62005I$ $b = -1.82668 + 1.01950I$ | $0.575579 - 0.242431I$ | 0 |
| $u = -0.479587 - 0.810655I$ $a = -2.03914 - 1.62005I$ $b = -1.82668 - 1.01950I$ | $0.575579 + 0.242431I$ | 0 |
| $u = 0.715946 + 0.802237I$ $a = 0.539436 - 1.067170I$ $b = -0.257897 + 0.053696I$ | $9.93624 + 4.63451I$ | 0 |
| $u = 0.715946 - 0.802237I$ $a = 0.539436 + 1.067170I$ $b = -0.257897 - 0.053696I$ | $9.93624 - 4.63451I$ | 0 |
| $u = -0.854505 + 0.665544I$ $a = -0.796795 - 0.332626I$ $b = -0.176428 - 0.335951I$ | $2.95184 - 4.02036I$ | 0 |
| $u = -0.854505 - 0.665544I$ $a = -0.796795 + 0.332626I$ $b = -0.176428 + 0.335951I$ | $2.95184 + 4.02036I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = 0.586692 + 0.921955I$ $a = -0.528186 + 0.484546I$ $b = -1.025630 - 0.779401I$ | $0.240812 + 0.859822I$ | 0 |
| $u = 0.586692 - 0.921955I$ $a = -0.528186 - 0.484546I$ $b = -1.025630 + 0.779401I$ | $0.240812 - 0.859822I$ | 0 |
| $u = 0.941357 + 0.564368I$ $a = 0.73528 - 1.28253I$ $b = -0.268509 - 0.334879I$ | $6.96139 - 7.48818I$ | 0 |
| $u = 0.941357 - 0.564368I$ $a = 0.73528 + 1.28253I$ $b = -0.268509 + 0.334879I$ | $6.96139 + 7.48818I$ | 0 |
| $u = -0.227715 + 0.870897I$ $a = -1.132120 + 0.819750I$ $b = -1.00126 + 2.27287I$ | $4.59030 + 2.48721I$ | 0 |
| $u = -0.227715 - 0.870897I$ $a = -1.132120 - 0.819750I$ $b = -1.00126 - 2.27287I$ | $4.59030 - 2.48721I$ | 0 |
| $u = -0.469961 + 0.996253I$ $a = 0.117592 - 0.706494I$ $b = -0.176725 - 0.538862I$ | $-0.29591 - 2.82467I$ | 0 |
| $u = -0.469961 - 0.996253I$ $a = 0.117592 + 0.706494I$ $b = -0.176725 + 0.538862I$ | $-0.29591 + 2.82467I$ | 0 |
| $u = 0.725179 + 0.524774I$ $a = -0.325303 + 1.068910I$ $b = -0.477568 - 0.087742I$ | $0.75510 - 3.03844I$ | 0 |
| $u = 0.725179 - 0.524774I$ $a = -0.325303 - 1.068910I$ $b = -0.477568 + 0.087742I$ | $0.75510 + 3.03844I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = 0.554611 + 0.696207I$ $a = -0.223070 + 0.519748I$ $b = -1.336370 - 0.225481I$ | $-0.019953 - 1.212380I$ | 0 |
| $u = 0.554611 - 0.696207I$ $a = -0.223070 - 0.519748I$ $b = -1.336370 + 0.225481I$ | $-0.019953 + 1.212380I$ | 0 |
| $u = 0.962589 + 0.556575I$ $a = -0.75736 + 1.32394I$ $b = 0.378198 + 0.314058I$ | $10.3327 - 12.4597I$ | 0 |
| $u = 0.962589 - 0.556575I$ $a = -0.75736 - 1.32394I$ $b = 0.378198 - 0.314058I$ | $10.3327 + 12.4597I$ | 0 |
| $u = 0.943879 + 0.593618I$ $a = -0.77992 + 1.24019I$ $b = 0.250347 + 0.480235I$ | $11.11290 - 3.11428I$ | 0 |
| $u = 0.943879 - 0.593618I$ $a = -0.77992 - 1.24019I$ $b = 0.250347 - 0.480235I$ | $11.11290 + 3.11428I$ | 0 |
| $u = 0.057724 + 1.127700I$ $a = -0.818291 - 0.459279I$ $b = -1.60759 - 0.56216I$ | $-4.49052 - 1.47159I$ | 0 |
| $u = 0.057724 - 1.127700I$ $a = -0.818291 + 0.459279I$ $b = -1.60759 + 0.56216I$ | $-4.49052 + 1.47159I$ | 0 |
| $u = 0.668394 + 0.918370I$ $a = 0.808515 - 0.261517I$ $b = 1.93517 - 1.09112I$ | $5.23269 + 5.06395I$ | 0 |
| $u = 0.668394 - 0.918370I$ $a = 0.808515 + 0.261517I$ $b = 1.93517 + 1.09112I$ | $5.23269 - 5.06395I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|-----------------|
| $u = -0.823991 + 0.245283I$ $a = -0.372283 - 0.132431I$ $b = 0.027700 + 0.356730I$ | $3.33552 + 0.83572I$ | 0 |
| $u = -0.823991 - 0.245283I$ $a = -0.372283 + 0.132431I$ $b = 0.027700 - 0.356730I$ | $3.33552 - 0.83572I$ | 0 |
| $u = 0.601782 + 0.972682I$ $a = 0.703124 - 0.423032I$ $b = 1.42206 + 0.41755I$ | $-0.91047 + 5.90697I$ | 0 |
| $u = 0.601782 - 0.972682I$ $a = 0.703124 + 0.423032I$ $b = 1.42206 - 0.41755I$ | $-0.91047 - 5.90697I$ | 0 |
| $u = 0.705390 + 0.901522I$ $a = -0.841518 + 0.355883I$ $b = -1.72949 + 1.16337I$ | $9.63753 + 0.79597I$ | 0 |
| $u = 0.705390 - 0.901522I$ $a = -0.841518 - 0.355883I$ $b = -1.72949 - 1.16337I$ | $9.63753 - 0.79597I$ | 0 |
| $u = -0.099316 + 0.839474I$ $a = -0.821647 + 0.664821I$ $b = -0.20449 + 2.25163I$ | $4.28144 - 5.96457I$ | $0. + 5.29148I$ |
| $u = -0.099316 - 0.839474I$ $a = -0.821647 - 0.664821I$ $b = -0.20449 - 2.25163I$ | $4.28144 + 5.96457I$ | $0. - 5.29148I$ |
| $u = 0.673062 + 0.946975I$ $a = -0.868424 + 0.223066I$ $b = -2.02019 + 1.21063I$ | $8.48686 + 10.20060I$ | 0 |
| $u = 0.673062 - 0.946975I$ $a = -0.868424 - 0.223066I$ $b = -2.02019 - 1.21063I$ | $8.48686 - 10.20060I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = -0.510107 + 1.048430I$ | | |
| $a = -0.087829 - 0.482061I$ | $-0.30671 - 2.85278I$ | 0 |
| $b = -0.458579 - 0.366228I$ | | |
| $u = -0.510107 - 1.048430I$ | | |
| $a = -0.087829 + 0.482061I$ | $-0.30671 + 2.85278I$ | 0 |
| $b = -0.458579 + 0.366228I$ | | |
| $u = -1.071010 + 0.486667I$ | | |
| $a = -0.610862 - 0.476506I$ | $6.08148 - 1.84087I$ | 0 |
| $b = 0.456865 - 0.021950I$ | | |
| $u = -1.071010 - 0.486667I$ | | |
| $a = -0.610862 + 0.476506I$ | $6.08148 + 1.84087I$ | 0 |
| $b = 0.456865 + 0.021950I$ | | |
| $u = -1.103540 + 0.452944I$ | | |
| $a = 0.574168 + 0.510120I$ | $9.73834 + 2.68285I$ | 0 |
| $b = -0.530356 - 0.076491I$ | | |
| $u = -1.103540 - 0.452944I$ | | |
| $a = 0.574168 - 0.510120I$ | $9.73834 - 2.68285I$ | 0 |
| $b = -0.530356 + 0.076491I$ | | |
| $u = -0.754105 + 0.931578I$ | | |
| $a = 0.769831 + 0.401589I$ | $2.18684 - 1.93079I$ | 0 |
| $b = 0.728793 + 0.726801I$ | | |
| $u = -0.754105 - 0.931578I$ | | |
| $a = 0.769831 - 0.401589I$ | $2.18684 + 1.93079I$ | 0 |
| $b = 0.728793 - 0.726801I$ | | |
| $u = 0.002586 + 1.199940I$ | | |
| $a = 0.736504 + 0.468001I$ | $-3.75632 - 5.69149I$ | 0 |
| $b = 1.46749 + 0.91439I$ | | |
| $u = 0.002586 - 1.199940I$ | | |
| $a = 0.736504 - 0.468001I$ | $-3.75632 + 5.69149I$ | 0 |
| $b = 1.46749 - 0.91439I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|----------------------|
| $u = 0.687416 + 0.991173I$ $a = -0.919889 + 0.614023I$ $b = -1.220630 + 0.402447I$ | $4.82666 + 7.06196I$ | 0 |
| $u = 0.687416 - 0.991173I$ $a = -0.919889 - 0.614023I$ $b = -1.220630 - 0.402447I$ | $4.82666 - 7.06196I$ | 0 |
| $u = -0.518497 + 0.591175I$ $a = 1.036080 - 0.036679I$ $b = 0.639685 - 0.395378I$ | $0.95922 - 1.38701I$ | $3.62313 + 4.03872I$ |
| $u = -0.518497 - 0.591175I$ $a = 1.036080 + 0.036679I$ $b = 0.639685 + 0.395378I$ | $0.95922 + 1.38701I$ | $3.62313 - 4.03872I$ |
| $u = -1.099180 + 0.521315I$ $a = 0.645774 + 0.505681I$ $b = -0.539820 + 0.112610I$ | $9.66501 - 6.42879I$ | 0 |
| $u = -1.099180 - 0.521315I$ $a = 0.645774 - 0.505681I$ $b = -0.539820 - 0.112610I$ | $9.66501 + 6.42879I$ | 0 |
| $u = -0.184337 + 0.753351I$ $a = 1.043900 - 0.529630I$ $b = 0.52687 - 1.73885I$ | $1.17620 - 1.56366I$ | $2.66486 + 2.86045I$ |
| $u = -0.184337 - 0.753351I$ $a = 1.043900 + 0.529630I$ $b = 0.52687 + 1.73885I$ | $1.17620 + 1.56366I$ | $2.66486 - 2.86045I$ |
| $u = 0.638797 + 1.047900I$ $a = 0.976434 - 0.378779I$ $b = 1.93206 - 0.21548I$ | $-0.75752 + 8.27205I$ | 0 |
| $u = 0.638797 - 1.047900I$ $a = 0.976434 + 0.378779I$ $b = 1.93206 + 0.21548I$ | $-0.75752 - 8.27205I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|----------------------|
| $u = -0.060387 + 0.767194I$ $a = 1.37998 + 0.44429I$ $b = 1.122470 - 0.118951I$ | $0.16533 - 2.35261I$ | $2.77573 + 4.98016I$ |
| $u = -0.060387 - 0.767194I$ $a = 1.37998 - 0.44429I$ $b = 1.122470 + 0.118951I$ | $0.16533 + 2.35261I$ | $2.77573 - 4.98016I$ |
| $u = 0.656616 + 1.078440I$ $a = -1.090710 + 0.369060I$ $b = -2.14362 + 0.50659I$ | $0.51181 + 13.10760I$ | 0 |
| $u = 0.656616 - 1.078440I$ $a = -1.090710 - 0.369060I$ $b = -2.14362 - 0.50659I$ | $0.51181 - 13.10760I$ | 0 |
| $u = -0.131918 + 1.294100I$ $a = 0.517379 + 0.471372I$ $b = 0.82271 + 1.42156I$ | $-0.44496 - 5.50904I$ | 0 |
| $u = -0.131918 - 1.294100I$ $a = 0.517379 - 0.471372I$ $b = 0.82271 - 1.42156I$ | $-0.44496 + 5.50904I$ | 0 |
| $u = -0.629427 + 1.140000I$ $a = 0.409419 + 0.186743I$ $b = 1.024250 + 0.332219I$ | $0.79695 - 6.19473I$ | 0 |
| $u = -0.629427 - 1.140000I$ $a = 0.409419 - 0.186743I$ $b = 1.024250 - 0.332219I$ | $0.79695 + 6.19473I$ | 0 |
| $u = -0.184178 + 1.304150I$ $a = -0.433758 - 0.444358I$ $b = -0.52426 - 1.44209I$ | $3.38019 - 1.36129I$ | 0 |
| $u = -0.184178 - 1.304150I$ $a = -0.433758 + 0.444358I$ $b = -0.52426 + 1.44209I$ | $3.38019 + 1.36129I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.732792 + 1.097870I$ $a = 1.281690 - 0.535052I$ $b = 1.97203 - 1.33997I$ | $9.54930 + 9.25447I$ | 0 |
| $u = 0.732792 - 1.097870I$ $a = 1.281690 + 0.535052I$ $b = 1.97203 + 1.33997I$ | $9.54930 - 9.25447I$ | 0 |
| $u = 0.719066 + 1.108810I$ $a = -1.285890 + 0.478952I$ $b = -2.15316 + 1.26035I$ | $5.2786 + 13.5702I$ | 0 |
| $u = 0.719066 - 1.108810I$ $a = -1.285890 - 0.478952I$ $b = -2.15316 - 1.26035I$ | $5.2786 - 13.5702I$ | 0 |
| $u = 0.723621 + 1.120700I$ $a = 1.325790 - 0.469571I$ $b = 2.25081 - 1.36835I$ | $8.5830 + 18.6152I$ | 0 |
| $u = 0.723621 - 1.120700I$ $a = 1.325790 + 0.469571I$ $b = 2.25081 + 1.36835I$ | $8.5830 - 18.6152I$ | 0 |
| $u = -0.122528 + 1.331290I$ $a = -0.503591 - 0.529859I$ $b = -0.86356 - 1.63805I$ | $2.80751 - 10.21780I$ | 0 |
| $u = -0.122528 - 1.331290I$ $a = -0.503591 + 0.529859I$ $b = -0.86356 + 1.63805I$ | $2.80751 + 10.21780I$ | 0 |
| $u = -0.792316 + 1.155410I$ $a = 0.701131 + 0.128222I$ $b = 1.30642 + 0.86455I$ | $4.06504 - 4.83337I$ | 0 |
| $u = -0.792316 - 1.155410I$ $a = 0.701131 - 0.128222I$ $b = 1.30642 - 0.86455I$ | $4.06504 + 4.83337I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------------|
| $u = -0.826959 + 1.146610I$ $a = -0.751232 - 0.139656I$ $b = -1.27812 - 1.00796I$ | $7.78064 - 0.43369I$ | 0 |
| $u = -0.826959 - 1.146610I$ $a = -0.751232 + 0.139656I$ $b = -1.27812 + 1.00796I$ | $7.78064 + 0.43369I$ | 0 |
| $u = -0.79655 + 1.18655I$ $a = -0.707249 - 0.080958I$ $b = -1.44030 - 0.86582I$ | $7.52726 - 9.46426I$ | 0 |
| $u = -0.79655 - 1.18655I$ $a = -0.707249 + 0.080958I$ $b = -1.44030 + 0.86582I$ | $7.52726 + 9.46426I$ | 0 |
| $u = -0.384256 + 0.053866I$ $a = -4.33938 - 0.12550I$ $b = -0.502514 - 0.052716I$ | $6.78584 - 4.52007I$ | $3.14532 + 3.49869I$ |
| $u = -0.384256 - 0.053866I$ $a = -4.33938 + 0.12550I$ $b = -0.502514 + 0.052716I$ | $6.78584 + 4.52007I$ | $3.14532 - 3.49869I$ |
| $u = -0.333373$ $a = 4.52744$ $b = 0.535469$ | 3.19926 | -0.0131130 |
| $u = 0.136187 + 0.228465I$ $a = 1.88069 + 0.93129I$ $b = -0.365190 - 0.698875I$ | $-0.37869 - 1.54324I$ | $-0.57658 + 5.32657I$ |
| $u = 0.136187 - 0.228465I$ $a = 1.88069 - 0.93129I$ $b = -0.365190 + 0.698875I$ | $-0.37869 + 1.54324I$ | $-0.57658 - 5.32657I$ |
| $u = 0.122192 + 0.109380I$ $a = 0.52539 + 4.38815I$ $b = 0.567044 - 0.364579I$ | $0.33050 - 1.99725I$ | $1.05958 + 4.02569I$ |

| | Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-------|------------------------|---------------------------------------|----------------------|
| $u =$ | $0.122192 - 0.109380I$ | | |
| $a =$ | $0.52539 - 4.38815I$ | $0.33050 + 1.99725I$ | $1.05958 - 4.02569I$ |
| $b =$ | $0.567044 + 0.364579I$ | | |

$$\text{II. } I_2^u = \langle b - 2, a - 1, u^2 + u + 1 \rangle$$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u \\ -u + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1 \\ -u - 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u \\ -u + 1 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -2u - 1 \\ -2u \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = $8u + 4$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|-------------------------------------|--------------------------------|
| c_1, c_3, c_4 c_5, c_7, c_9 | $u^2 - u + 1$ |
| c_2, c_6, c_8 c_{10}, c_{11} | $u^2 + u + 1$ |
| c_{12} | u^2 |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|---|------------------------------------|
| c_1, c_2, c_3 c_4, c_5, c_6 c_7, c_8, c_9 c_{10}, c_{11} | $y^2 + y + 1$ |
| c_{12} | y^2 |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_2^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------|
| $u = -0.500000 + 0.866025I$ $a = 1.00000$ $b = 2.00000$ | $-4.05977I$ | $0. + 6.92820I$ |
| $u = -0.500000 - 0.866025I$ $a = 1.00000$ $b = 2.00000$ | $4.05977I$ | $0. - 6.92820I$ |

$$\text{III. } I_3^u = \langle b + 1, a + u + 1, u^2 + u + 1 \rangle$$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u - 1 \\ -1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u + 1 \\ u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u + 1 \\ u + 1 \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} -u + 1 \\ 1 \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = 3

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|-------------------------------------|--------------------------------|
| c_1, c_5, c_7 c_9 | $u^2 - u + 1$ |
| c_2, c_6, c_8 c_{10}, c_{11} | $u^2 + u + 1$ |
| c_3, c_4 | $(u + 1)^2$ |
| c_{12} | u^2 |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|---|------------------------------------|
| c_1, c_2, c_5 c_6, c_7, c_8 c_9, c_{10}, c_{11} | $y^2 + y + 1$ |
| c_3, c_4 | $(y - 1)^2$ |
| c_{12} | y^2 |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_3^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = -0.500000 + 0.866025I$ $a = -0.500000 - 0.866025I$ $b = -1.000000$ | 0 | 3.00000 |
| $u = -0.500000 - 0.866025I$ $a = -0.500000 + 0.866025I$ $b = -1.000000$ | 0 | 3.00000 |

IV. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|-----------|---|
| c_1 | $((u^2 - u + 1)^2)(u^{111} + 41u^{110} + \dots - 12u - 1)$ |
| c_2 | $((u^2 + u + 1)^2)(u^{111} + 3u^{110} + \dots - 8u - 1)$ |
| c_3 | $((u + 1)^2)(u^2 - u + 1)(u^{111} - 2u^{110} + \dots + 128151u - 22181)$ |
| c_4 | $((u + 1)^2)(u^2 - u + 1)(u^{111} + 39u^{109} + \dots - 1.05710 \times 10^7 u - 2188019)$ |
| c_5 | $((u^2 - u + 1)^2)(u^{111} + 3u^{110} + \dots - 8u - 1)$ |
| c_6 | $((u^2 + u + 1)^2)(u^{111} - 3u^{110} + \dots + 3962u - 1217)$ |
| c_7 | $((u^2 - u + 1)^2)(u^{111} + 3u^{110} + \dots + 2u - 1)$ |
| c_8 | $((u^2 + u + 1)^2)(u^{111} + 3u^{110} + \dots - 2u - 1)$ |
| c_9 | $((u^2 - u + 1)^2)(u^{111} - 3u^{110} + \dots + 3962u - 1217)$ |
| c_{10} | $((u^2 + u + 1)^2)(u^{111} - 61u^{110} + \dots - 8u + 1)$ |
| c_{11} | $((u^2 + u + 1)^2)(u^{111} + 3u^{110} + \dots + 2u - 1)$ |
| c_{12} | $u^4(u^{111} + 11u^{110} + \dots - 16u + 16)$ |

V. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---------------|--|
| c_1 | $((y^2 + y + 1)^2)(y^{111} + 61y^{110} + \dots - 2780y - 1)$ |
| c_2, c_5 | $((y^2 + y + 1)^2)(y^{111} + 41y^{110} + \dots - 12y - 1)$ |
| c_3 | $(y - 1)^2(y^2 + y + 1)$ $\cdot (y^{111} + 150y^{110} + \dots - 11615036801y - 491996761)$ |
| c_4 | $(y - 1)^2(y^2 + y + 1)$ $\cdot (y^{111} + 78y^{110} + \dots + 215220189102279y - 4787427144361)$ |
| c_6, c_9 | $((y^2 + y + 1)^2)(y^{111} - 99y^{110} + \dots - 2.28912 \times 10^7 y - 1481089)$ |
| c_7, c_{11} | $((y^2 + y + 1)^2)(y^{111} + 61y^{110} + \dots - 8y - 1)$ |
| c_8 | $((y^2 + y + 1)^2)(y^{111} + 13y^{110} + \dots - 8y - 1)$ |
| c_{10} | $((y^2 + y + 1)^2)(y^{111} - 19y^{110} + \dots + 148y - 1)$ |
| c_{12} | $y^4(y^{111} - 25y^{110} + \dots + 6272y - 256)$ |