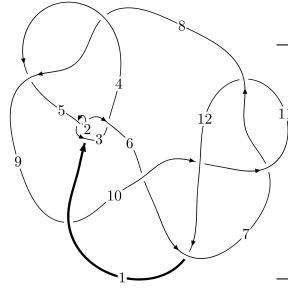
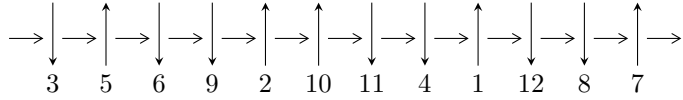


12a₀₀₁₇ (K12a₀₀₁₇)



A knot diagram¹

Linearized knot diagram



Solving Sequence

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

Ideals for irreducible components² of X_{par}

$$I_1^u = \langle u^{122} + 5u^{121} + \dots + 2b - 8, -17u^{122} + 41u^{121} + \dots + 2a - 15, u^{123} - 3u^{122} + \dots + 2u - 1 \rangle$$

$$I_2^u = \langle -u^2a + b, -u^4a - u^3a + u^2a - u^3 + a^2 + au - u^2 + 1, u^6 + u^5 - u^4 - 2u^3 + u + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 135 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.

$$\mathbf{I. } I_1^u = \langle u^{122} + 5u^{121} + \dots + 2b - 8, -17u^{122} + 41u^{121} + \dots + 2a - 15, u^{123} - 3u^{122} + \dots + 2u - 1 \rangle$$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} \frac{17}{2}u^{122} - \frac{41}{2}u^{121} + \dots - 11u + \frac{15}{2} \\ -\frac{1}{2}u^{122} - \frac{5}{2}u^{121} + \dots + \frac{1}{2}u + 4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^{11} + 2u^9 - 2u^7 + u^3 \\ -u^{11} + 3u^9 - 4u^7 + 3u^5 - u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} \frac{7}{2}u^{122} - \frac{11}{2}u^{121} + \dots - 3u + \frac{1}{2} \\ \frac{1}{2}u^{122} + \frac{1}{2}u^{121} + \dots - \frac{5}{2}u^2 + \frac{3}{2}u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^8 - u^6 + u^4 + 1 \\ u^{10} - 2u^8 + 3u^6 - 2u^4 + u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 5u^{122} - 12u^{121} + \dots - 5u + \frac{9}{2} \\ -u^{122} + 29u^{120} + \dots + \frac{3}{2}u + 2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^{122} + 2u^{121} + \dots + 3u - \frac{3}{2} \\ \frac{1}{2}u^{119} - \frac{1}{2}u^{118} + \dots - 2u^2 + \frac{3}{2}u \end{pmatrix}$$

(ii) Obstruction class = -1

$$\text{(iii) Cusp Shapes} = -13u^{122} + \frac{57}{2}u^{121} + \dots + \frac{45}{2}u - 14$$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|---------------|---|
| c_1 | $u^{123} + 61u^{122} + \dots - 6u - 1$ |
| c_2, c_5 | $u^{123} + 7u^{122} + \dots + 8u + 1$ |
| c_3 | $u^{123} - 7u^{122} + \dots - 128330u + 93361$ |
| c_4, c_8 | $u^{123} - u^{122} + \dots + 4096u + 4096$ |
| c_6 | $u^{123} - 3u^{122} + \dots - 10870u + 2425$ |
| c_7, c_{11} | $u^{123} + 3u^{122} + \dots + 2u + 1$ |
| c_9 | $u^{123} + 13u^{122} + \dots + 429074u + 27289$ |
| c_{10} | $u^{123} + 59u^{122} + \dots - 2u + 1$ |
| c_{12} | $u^{123} + 9u^{122} + \dots + 4066u + 1237$ |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|---------------|---|
| c_1 | $y^{123} + 9y^{122} + \dots - 14y - 1$ |
| c_2, c_5 | $y^{123} + 61y^{122} + \dots - 6y - 1$ |
| c_3 | $y^{123} - 43y^{122} + \dots - 33652263950y - 8716276321$ |
| c_4, c_8 | $y^{123} - 65y^{122} + \dots + 419430400y - 16777216$ |
| c_6 | $y^{123} - 19y^{122} + \dots + 113874350y - 5880625$ |
| c_7, c_{11} | $y^{123} - 59y^{122} + \dots - 2y - 1$ |
| c_9 | $y^{123} + 41y^{122} + \dots - 732678681206y - 744689521$ |
| c_{10} | $y^{123} + 13y^{122} + \dots - 14y - 1$ |
| c_{12} | $y^{123} + 33y^{122} + \dots - 130598898y - 1530169$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|------------|
| $u = 0.854485 + 0.561421I$ $a = 0.003316 - 0.563932I$ $b = -0.626981 + 0.060520I$ | $-4.46926 - 2.02015I$ | 0 |
| $u = 0.854485 - 0.561421I$ $a = 0.003316 + 0.563932I$ $b = -0.626981 - 0.060520I$ | $-4.46926 + 2.02015I$ | 0 |
| $u = 1.033990 + 0.061446I$ $a = 1.025610 + 0.127051I$ $b = 0.0245682 + 0.0714771I$ | $-4.13307 - 3.64032I$ | 0 |
| $u = 1.033990 - 0.061446I$ $a = 1.025610 - 0.127051I$ $b = 0.0245682 - 0.0714771I$ | $-4.13307 + 3.64032I$ | 0 |
| $u = 1.019840 + 0.221186I$ $a = -0.572632 - 0.294367I$ $b = 0.092325 - 0.139506I$ | $-1.90019 - 0.28526I$ | 0 |
| $u = 1.019840 - 0.221186I$ $a = -0.572632 + 0.294367I$ $b = 0.092325 + 0.139506I$ | $-1.90019 + 0.28526I$ | 0 |
| $u = 0.657781 + 0.664492I$ $a = -0.27330 + 1.72372I$ $b = -0.297545 + 0.371755I$ | $-1.85277 - 10.74350I$ | 0 |
| $u = 0.657781 - 0.664492I$ $a = -0.27330 - 1.72372I$ $b = -0.297545 - 0.371755I$ | $-1.85277 + 10.74350I$ | 0 |
| $u = 0.687369 + 0.623539I$ $a = -0.29318 + 1.44183I$ $b = -0.048159 + 0.259545I$ | $-3.96911 - 2.64638I$ | 0 |
| $u = 0.687369 - 0.623539I$ $a = -0.29318 - 1.44183I$ $b = -0.048159 - 0.259545I$ | $-3.96911 + 2.64638I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|------------|
| $u = 0.917903 + 0.565000I$ | | |
| $a = 0.082196 + 0.192568I$ | $-0.166656 + 0.924245I$ | 0 |
| $b = 0.905526 - 0.344687I$ | | |
| $u = 0.917903 - 0.565000I$ | | |
| $a = 0.082196 - 0.192568I$ | $-0.166656 - 0.924245I$ | 0 |
| $b = 0.905526 + 0.344687I$ | | |
| $u = -0.962014 + 0.501805I$ | | |
| $a = 1.14651 + 1.46118I$ | $-0.279306 - 0.572542I$ | 0 |
| $b = 1.71891 + 0.68501I$ | | |
| $u = -0.962014 - 0.501805I$ | | |
| $a = 1.14651 - 1.46118I$ | $-0.279306 + 0.572542I$ | 0 |
| $b = 1.71891 - 0.68501I$ | | |
| $u = 0.648152 + 0.645593I$ | | |
| $a = 0.38530 - 1.67689I$ | $0.62783 - 5.66862I$ | 0 |
| $b = 0.281699 - 0.248240I$ | | |
| $u = 0.648152 - 0.645593I$ | | |
| $a = 0.38530 + 1.67689I$ | $0.62783 + 5.66862I$ | 0 |
| $b = 0.281699 + 0.248240I$ | | |
| $u = 0.912418 + 0.590250I$ | | |
| $a = -0.263358 - 0.252976I$ | $-2.60544 + 5.87088I$ | 0 |
| $b = -1.030770 + 0.176984I$ | | |
| $u = 0.912418 - 0.590250I$ | | |
| $a = -0.263358 + 0.252976I$ | $-2.60544 - 5.87088I$ | 0 |
| $b = -1.030770 - 0.176984I$ | | |
| $u = 1.048540 + 0.385425I$ | | |
| $a = 0.433108 - 0.660989I$ | $-3.06638 - 1.39605I$ | 0 |
| $b = 0.422710 + 0.320271I$ | | |
| $u = 1.048540 - 0.385425I$ | | |
| $a = 0.433108 + 0.660989I$ | $-3.06638 + 1.39605I$ | 0 |
| $b = 0.422710 - 0.320271I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|------------|
| $u = 0.985605 + 0.527401I$ $a = -0.412366 - 0.202768I$ $b = 0.696926 - 1.116170I$ | $1.30652 - 1.06855I$ | 0 |
| $u = 0.985605 - 0.527401I$ $a = -0.412366 + 0.202768I$ $b = 0.696926 + 1.116170I$ | $1.30652 + 1.06855I$ | 0 |
| $u = 1.087640 + 0.274343I$ $a = -0.353683 - 0.740293I$ $b = 0.250172 - 0.184177I$ | $-2.47005 - 0.30272I$ | 0 |
| $u = 1.087640 - 0.274343I$ $a = -0.353683 + 0.740293I$ $b = 0.250172 + 0.184177I$ | $-2.47005 + 0.30272I$ | 0 |
| $u = -0.505350 + 0.716113I$ $a = 0.828458 + 0.277865I$ $b = 0.921356 - 0.358807I$ | $1.06865 - 4.56495I$ | 0 |
| $u = -0.505350 - 0.716113I$ $a = 0.828458 - 0.277865I$ $b = 0.921356 + 0.358807I$ | $1.06865 + 4.56495I$ | 0 |
| $u = -0.995492 + 0.532233I$ $a = -0.97900 - 1.25049I$ $b = -1.45523 - 0.58880I$ | $1.41929 + 3.95035I$ | 0 |
| $u = -0.995492 - 0.532233I$ $a = -0.97900 + 1.25049I$ $b = -1.45523 + 0.58880I$ | $1.41929 - 3.95035I$ | 0 |
| $u = -1.095060 + 0.295281I$ $a = 3.02439 + 0.12421I$ $b = 2.53218 - 1.86329I$ | $-3.16948 + 2.81128I$ | 0 |
| $u = -1.095060 - 0.295281I$ $a = 3.02439 - 0.12421I$ $b = 2.53218 + 1.86329I$ | $-3.16948 - 2.81128I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------|
| $u = -1.102410 + 0.267908I$ $a = -2.77281 + 0.10154I$ $b = -2.15753 + 2.01225I$ | $-2.88698 - 2.46184I$ | 0 |
| $u = -1.102410 - 0.267908I$ $a = -2.77281 - 0.10154I$ $b = -2.15753 - 2.01225I$ | $-2.88698 + 2.46184I$ | 0 |
| $u = -0.448019 + 0.736719I$ $a = 0.745796 - 0.073275I$ $b = 0.594549 - 0.660727I$ | $0.78043 + 2.03644I$ | 0 |
| $u = -0.448019 - 0.736719I$ $a = 0.745796 + 0.073275I$ $b = 0.594549 + 0.660727I$ | $0.78043 - 2.03644I$ | 0 |
| $u = 0.858281$ $a = -0.927426$ $b = 0.108938$ | -1.50207 | -5.95250 |
| $u = 1.017760 + 0.522481I$ $a = 0.811698 + 0.352586I$ $b = -0.44309 + 1.64463I$ | $0.27133 - 5.98593I$ | 0 |
| $u = 1.017760 - 0.522481I$ $a = 0.811698 - 0.352586I$ $b = -0.44309 - 1.64463I$ | $0.27133 + 5.98593I$ | 0 |
| $u = -0.621924 + 0.587387I$ $a = 0.727972 + 1.082340I$ $b = 1.223970 + 0.460141I$ | $0.70009 + 4.93753I$ | 0 |
| $u = -0.621924 - 0.587387I$ $a = 0.727972 - 1.082340I$ $b = 1.223970 - 0.460141I$ | $0.70009 - 4.93753I$ | 0 |
| $u = 0.326719 + 0.783768I$ $a = -0.60353 - 1.35303I$ $b = 2.26170 - 0.29466I$ | $-3.54566 + 13.00910I$ | $0. - 8.03983I$ |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------|
| $u = 0.326719 - 0.783768I$ $a = -0.60353 + 1.35303I$ $b = 2.26170 + 0.29466I$ | $-3.54566 - 13.00910I$ | $0. + 8.03983I$ |
| $u = 1.123590 + 0.265053I$ $a = 0.502221 + 0.942772I$ $b = -0.263992 + 0.306687I$ | $-5.04425 + 3.82260I$ | 0 |
| $u = 1.123590 - 0.265053I$ $a = 0.502221 - 0.942772I$ $b = -0.263992 - 0.306687I$ | $-5.04425 - 3.82260I$ | 0 |
| $u = -0.510966 + 0.671472I$ $a = -0.654545 - 0.468997I$ $b = -0.869605 + 0.071896I$ | $2.93696 - 0.44778I$ | 0 |
| $u = -0.510966 - 0.671472I$ $a = -0.654545 + 0.468997I$ $b = -0.869605 - 0.071896I$ | $2.93696 + 0.44778I$ | 0 |
| $u = 1.119360 + 0.310725I$ $a = 0.185438 + 1.038430I$ $b = -0.432873 + 0.226764I$ | $-5.53092 - 3.70026I$ | 0 |
| $u = 1.119360 - 0.310725I$ $a = 0.185438 - 1.038430I$ $b = -0.432873 - 0.226764I$ | $-5.53092 + 3.70026I$ | 0 |
| $u = 0.324855 + 0.771366I$ $a = 0.72033 + 1.32461I$ $b = -2.21918 + 0.30802I$ | $-0.98344 + 7.78701I$ | $0. - 4.67811I$ |
| $u = 0.324855 - 0.771366I$ $a = 0.72033 - 1.32461I$ $b = -2.21918 - 0.30802I$ | $-0.98344 - 7.78701I$ | $0. + 4.67811I$ |
| $u = 0.581489 + 0.598075I$ $a = 0.89914 - 1.66803I$ $b = 0.309435 + 0.200315I$ | $2.49653 - 3.41082I$ | $0. + 7.23745I$ |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------------|
| $u = 0.581489 - 0.598075I$ $a = 0.89914 + 1.66803I$ $b = 0.309435 - 0.200315I$ | $2.49653 + 3.41082I$ | $0. - 7.23745I$ |
| $u = -1.142960 + 0.238255I$ $a = -2.32696 - 0.11666I$ $b = -1.74160 + 1.67456I$ | $-5.56302 - 4.94470I$ | 0 |
| $u = -1.142960 - 0.238255I$ $a = -2.32696 + 0.11666I$ $b = -1.74160 - 1.67456I$ | $-5.56302 + 4.94470I$ | 0 |
| $u = -1.063460 + 0.492512I$ $a = 1.46708 + 0.61955I$ $b = 1.53045 - 0.21359I$ | $-2.35808 + 5.38729I$ | 0 |
| $u = -1.063460 - 0.492512I$ $a = 1.46708 - 0.61955I$ $b = 1.53045 + 0.21359I$ | $-2.35808 - 5.38729I$ | 0 |
| $u = 0.300988 + 0.770638I$ $a = -0.690849 - 1.102760I$ $b = 2.17376 - 0.22546I$ | $-5.84365 + 4.55880I$ | $-6.44547 - 2.49035I$ |
| $u = 0.300988 - 0.770638I$ $a = -0.690849 + 1.102760I$ $b = 2.17376 + 0.22546I$ | $-5.84365 - 4.55880I$ | $-6.44547 + 2.49035I$ |
| $u = -0.563362 + 0.602679I$ $a = -0.615246 - 0.881766I$ $b = -1.040120 - 0.318191I$ | $2.69193 + 0.55935I$ | $3.98610 + 0.I$ |
| $u = -0.563362 - 0.602679I$ $a = -0.615246 + 0.881766I$ $b = -1.040120 + 0.318191I$ | $2.69193 - 0.55935I$ | $3.98610 + 0.I$ |
| $u = -1.152950 + 0.230458I$ $a = 2.24298 + 0.18923I$ $b = 1.66975 - 1.59343I$ | $-8.21753 - 10.13550I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------|
| $u = -1.152950 - 0.230458I$ $a = 2.24298 - 0.18923I$ $b = 1.66975 + 1.59343I$ | $-8.21753 + 10.13550I$ | 0 |
| $u = -0.405700 + 0.715550I$ $a = -0.547830 + 0.258526I$ $b = -0.233364 + 0.680720I$ | $2.43695 - 1.70720I$ | $1.69325 + 0.I$ |
| $u = -0.405700 - 0.715550I$ $a = -0.547830 - 0.258526I$ $b = -0.233364 - 0.680720I$ | $2.43695 + 1.70720I$ | $1.69325 + 0.I$ |
| $u = -1.030200 + 0.571691I$ $a = -0.516402 - 1.134700I$ $b = -0.985503 - 0.722266I$ | $1.40801 + 5.27406I$ | 0 |
| $u = -1.030200 - 0.571691I$ $a = -0.516402 + 1.134700I$ $b = -0.985503 + 0.722266I$ | $1.40801 - 5.27406I$ | 0 |
| $u = -1.153290 + 0.256833I$ $a = 2.45010 + 0.23769I$ $b = 1.88125 - 1.56566I$ | $-10.34180 - 1.56416I$ | 0 |
| $u = -1.153290 - 0.256833I$ $a = 2.45010 - 0.23769I$ $b = 1.88125 + 1.56566I$ | $-10.34180 + 1.56416I$ | 0 |
| $u = -1.141170 + 0.345577I$ $a = 2.74400 + 0.42807I$ $b = 2.32803 - 1.27018I$ | $-6.77873 + 4.44845I$ | 0 |
| $u = -1.141170 - 0.345577I$ $a = 2.74400 - 0.42807I$ $b = 2.32803 + 1.27018I$ | $-6.77873 - 4.44845I$ | 0 |
| $u = -1.039880 + 0.593668I$ $a = 0.269757 + 1.286620I$ $b = 0.839442 + 0.975017I$ | $-0.50937 + 9.58006I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|-----------------------|
| $u = -1.039880 - 0.593668I$ $a = 0.269757 - 1.286620I$ $b = 0.839442 - 0.975017I$ | $-0.50937 - 9.58006I$ | 0 |
| $u = -0.314117 + 0.738169I$ $a = 0.575358 - 0.604862I$ $b = -0.157550 - 1.089370I$ | $-0.72558 - 6.64128I$ | $-2.45271 + 5.62875I$ |
| $u = -0.314117 - 0.738169I$ $a = 0.575358 + 0.604862I$ $b = -0.157550 + 1.089370I$ | $-0.72558 + 6.64128I$ | $-2.45271 - 5.62875I$ |
| $u = -1.154440 + 0.326977I$ $a = -2.73063 - 0.39678I$ $b = -2.24616 + 1.33762I$ | $-11.15920 + 0.73897I$ | 0 |
| $u = -1.154440 - 0.326977I$ $a = -2.73063 + 0.39678I$ $b = -2.24616 - 1.33762I$ | $-11.15920 - 0.73897I$ | 0 |
| $u = 0.329435 + 0.722217I$ $a = 1.26469 + 1.24360I$ $b = -2.06959 + 0.45452I$ | $1.34347 + 5.13610I$ | $-0.89905 - 6.52878I$ |
| $u = 0.329435 - 0.722217I$ $a = 1.26469 - 1.24360I$ $b = -2.06959 - 0.45452I$ | $1.34347 - 5.13610I$ | $-0.89905 + 6.52878I$ |
| $u = -1.153440 + 0.356078I$ $a = -2.72091 - 0.41587I$ $b = -2.27381 + 1.22883I$ | $-9.68798 + 9.41535I$ | 0 |
| $u = -1.153440 - 0.356078I$ $a = -2.72091 + 0.41587I$ $b = -2.27381 - 1.22883I$ | $-9.68798 - 9.41535I$ | 0 |
| $u = -0.337945 + 0.711241I$ $a = -0.514362 + 0.535580I$ $b = 0.117785 + 0.912749I$ | $1.68112 - 2.28331I$ | $2.01200 + 1.73250I$ |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|-----------------------|
| $u = -0.337945 - 0.711241I$ | | |
| $a = -0.514362 - 0.535580I$ | $1.68112 + 2.28331I$ | $2.01200 - 1.73250I$ |
| $b = 0.117785 - 0.912749I$ | | |
| $u = 0.531699 + 0.571261I$ | | |
| $a = -1.31269 + 1.58049I$ | $1.71359 + 1.58676I$ | $-0.51367 + 2.12597I$ |
| $b = -0.189489 - 0.498823I$ | | |
| $u = 0.531699 - 0.571261I$ | | |
| $a = -1.31269 - 1.58049I$ | $1.71359 - 1.58676I$ | $-0.51367 - 2.12597I$ |
| $b = -0.189489 + 0.498823I$ | | |
| $u = -1.074920 + 0.589470I$ | | |
| $a = -0.231426 + 1.076660I$ | $-1.06964 + 3.01381I$ | 0 |
| $b = 0.305449 + 1.020630I$ | | |
| $u = -1.074920 - 0.589470I$ | | |
| $a = -0.231426 - 1.076660I$ | $-1.06964 - 3.01381I$ | 0 |
| $b = 0.305449 - 1.020630I$ | | |
| $u = -1.089820 + 0.571745I$ | | |
| $a = 0.566381 - 0.717391I$ | $0.42992 + 6.63920I$ | 0 |
| $b = 0.140524 - 0.866907I$ | | |
| $u = -1.089820 - 0.571745I$ | | |
| $a = 0.566381 + 0.717391I$ | $0.42992 - 6.63920I$ | 0 |
| $b = 0.140524 + 0.866907I$ | | |
| $u = 1.111230 + 0.545507I$ | | |
| $a = 2.45891 - 1.62700I$ | $-1.45622 - 4.63554I$ | 0 |
| $b = 3.32507 + 1.26226I$ | | |
| $u = 1.111230 - 0.545507I$ | | |
| $a = 2.45891 + 1.62700I$ | $-1.45622 + 4.63554I$ | 0 |
| $b = 3.32507 - 1.26226I$ | | |
| $u = 0.323938 + 0.689603I$ | | |
| $a = -1.58714 - 0.95579I$ | $0.818092 - 0.124046I$ | $-3.14780 - 0.83223I$ |
| $b = 1.89255 - 0.55461I$ | | |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------------|
| $u = 0.323938 - 0.689603I$ $a = -1.58714 + 0.95579I$ $b = 1.89255 + 0.55461I$ | $0.818092 + 0.124046I$ | $-3.14780 + 0.83223I$ |
| $u = 1.132130 + 0.504504I$ $a = 1.68573 - 1.49625I$ $b = 2.18204 + 0.67494I$ | $-5.70491 - 3.44197I$ | 0 |
| $u = 1.132130 - 0.504504I$ $a = 1.68573 + 1.49625I$ $b = 2.18204 - 0.67494I$ | $-5.70491 + 3.44197I$ | 0 |
| $u = -1.119960 + 0.532893I$ $a = -1.45764 + 0.36603I$ $b = -1.02362 + 0.98782I$ | $-4.02319 + 3.95622I$ | 0 |
| $u = -1.119960 - 0.532893I$ $a = -1.45764 - 0.36603I$ $b = -1.02362 - 0.98782I$ | $-4.02319 - 3.95622I$ | 0 |
| $u = -1.111910 + 0.553776I$ $a = 1.142580 - 0.571408I$ $b = 0.680128 - 1.006950I$ | $-0.57041 + 7.12600I$ | 0 |
| $u = -1.111910 - 0.553776I$ $a = 1.142580 + 0.571408I$ $b = 0.680128 + 1.006950I$ | $-0.57041 - 7.12600I$ | 0 |
| $u = 0.203285 + 0.729617I$ $a = 0.726731 + 0.322337I$ $b = -1.81310 - 0.11441I$ | $-7.16219 + 2.64076I$ | $-7.80104 - 2.59513I$ |
| $u = 0.203285 - 0.729617I$ $a = 0.726731 - 0.322337I$ $b = -1.81310 + 0.11441I$ | $-7.16219 - 2.64076I$ | $-7.80104 + 2.59513I$ |
| $u = 1.142870 + 0.494166I$ $a = -1.51219 + 1.59682I$ $b = -2.05783 - 0.43237I$ | $-8.75415 + 1.36519I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|--|---------------------------------------|-----------------------|
| $u = 1.142870 - 0.494166I$ $a = -1.51219 - 1.59682I$ $b = -2.05783 + 0.43237I$ | $-8.75415 - 1.36519I$ | 0 |
| $u = 1.116840 + 0.555196I$ $a = -2.40203 + 1.83735I$ $b = -3.52952 - 0.89285I$ | $-0.94884 - 10.00770I$ | 0 |
| $u = 1.116840 - 0.555196I$ $a = -2.40203 - 1.83735I$ $b = -3.52952 + 0.89285I$ | $-0.94884 + 10.00770I$ | 0 |
| $u = -1.124970 + 0.555762I$ $a = -1.31913 + 0.71542I$ $b = -0.75747 + 1.20075I$ | $-3.08943 + 11.54780I$ | 0 |
| $u = -1.124970 - 0.555762I$ $a = -1.31913 - 0.71542I$ $b = -0.75747 - 1.20075I$ | $-3.08943 - 11.54780I$ | 0 |
| $u = 1.143390 + 0.517843I$ $a = -1.79911 + 1.70410I$ $b = -2.47710 - 0.50435I$ | $-9.86641 - 7.31652I$ | 0 |
| $u = 1.143390 - 0.517843I$ $a = -1.79911 - 1.70410I$ $b = -2.47710 + 0.50435I$ | $-9.86641 + 7.31652I$ | 0 |
| $u = -0.271121 + 0.683887I$ $a = 0.479920 - 0.674630I$ $b = -0.416798 - 0.951510I$ | $-1.60447 + 0.71899I$ | $-4.24680 - 0.96822I$ |
| $u = -0.271121 - 0.683887I$ $a = 0.479920 + 0.674630I$ $b = -0.416798 + 0.951510I$ | $-1.60447 - 0.71899I$ | $-4.24680 + 0.96822I$ |
| $u = 1.131700 + 0.568256I$ $a = -2.25505 + 1.97886I$ $b = -3.48207 - 0.39438I$ | $-3.35699 - 12.82570I$ | 0 |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------------|
| $u = 1.131700 - 0.568256I$ $a = -2.25505 - 1.97886I$ $b = -3.48207 + 0.39438I$ | $-3.35699 + 12.82570I$ | 0 |
| $u = 1.137910 + 0.560409I$ $a = 2.19776 - 1.94535I$ $b = 3.29821 + 0.41025I$ | $-8.30040 - 9.55743I$ | 0 |
| $u = 1.137910 - 0.560409I$ $a = 2.19776 + 1.94535I$ $b = 3.29821 - 0.41025I$ | $-8.30040 + 9.55743I$ | 0 |
| $u = 1.135060 + 0.572499I$ $a = 2.24277 - 2.00284I$ $b = 3.48187 + 0.30110I$ | $-5.9309 - 18.0955I$ | 0 |
| $u = 1.135060 - 0.572499I$ $a = 2.24277 + 2.00284I$ $b = 3.48187 - 0.30110I$ | $-5.9309 + 18.0955I$ | 0 |
| $u = 0.145735 + 0.712891I$ $a = 0.674421 + 0.018185I$ $b = -1.63547 - 0.32069I$ | $-5.91594 - 5.85172I$ | $-6.29729 + 4.24575I$ |
| $u = 0.145735 - 0.712891I$ $a = 0.674421 - 0.018185I$ $b = -1.63547 + 0.32069I$ | $-5.91594 + 5.85172I$ | $-6.29729 - 4.24575I$ |
| $u = 0.176087 + 0.688838I$ $a = -0.843367 - 0.085955I$ $b = 1.59406 + 0.15723I$ | $-3.01456 - 1.05590I$ | $-3.38153 + 0.61296I$ |
| $u = 0.176087 - 0.688838I$ $a = -0.843367 + 0.085955I$ $b = 1.59406 - 0.15723I$ | $-3.01456 + 1.05590I$ | $-3.38153 - 0.61296I$ |
| $u = -0.524300 + 0.363728I$ $a = 0.120376 + 1.403430I$ $b = 0.704675 + 0.874117I$ | $-0.46580 - 1.46675I$ | $-2.13692 + 1.59125I$ |

| Solutions to I_1^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|-----------------------|
| $u = -0.524300 - 0.363728I$ | | |
| $a = 0.120376 - 1.403430I$ | $-0.46580 + 1.46675I$ | $-2.13692 - 1.59125I$ |
| $b = 0.704675 - 0.874117I$ | | |
| $u = -0.127753 + 0.355275I$ | | |
| $a = -0.80595 + 1.22969I$ | $-0.33354 - 1.50737I$ | $-2.96396 + 4.38386I$ |
| $b = 0.539578 + 0.492331I$ | | |
| $u = -0.127753 - 0.355275I$ | | |
| $a = -0.80595 - 1.22969I$ | $-0.33354 + 1.50737I$ | $-2.96396 - 4.38386I$ |
| $b = 0.539578 - 0.492331I$ | | |

$$\langle -u^2a+b, -u^4a-u^3a+u^2a-u^3+a^2+au-u^2+1, u^6+u^5-u^4-2u^3+u+1 \rangle$$

II. $I_2^u =$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} a \\ u^2a \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} a \\ u^2a \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u \\ -u^3+u \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u^3 \\ u^5-u^3+u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^3 \\ u^3-u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^3a \\ u^5a-u^3a+au \end{pmatrix}$$

$$a_2 = \begin{pmatrix} u^3a-u^4-u^3+u^2+u \\ u^5a-u^3a-u^3+au+u+1 \end{pmatrix}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes = $-3u^5a + u^4a + 4u^3a + 4u^4 - 2u^2a + u^3 - 4au - 3u^2 - 4u - 3$

(iv) u-Polynomials at the component

| Crossings | u-Polynomials at each crossing |
|--------------------|---|
| c_1, c_3, c_5 | $(u^2 - u + 1)^6$ |
| c_2 | $(u^2 + u + 1)^6$ |
| c_4, c_8 | u^{12} |
| c_6, c_9, c_{11} | $(u^6 - u^5 - u^4 + 2u^3 - u + 1)^2$ |
| c_7 | $(u^6 + u^5 - u^4 - 2u^3 + u + 1)^2$ |
| c_{10}, c_{12} | $(u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)^2$ |

(v) Riley Polynomials at the component

| Crossings | Riley Polynomials at each crossing |
|-----------------------------|---|
| c_1, c_2, c_3 c_5 | $(y^2 + y + 1)^6$ |
| c_4, c_8 | y^{12} |
| c_6, c_7, c_9 c_{11} | $(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$ |
| c_{10}, c_{12} | $(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2$ |

(vi) Complex Volumes and Cusp Shapes

| Solutions to I_2^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---------------------------------------|-----------------------|
| $u = 1.002190 + 0.295542I$ $a = 0.578212 + 1.125030I$ $b = -0.136196 + 1.374220I$ | $-1.89061 + 1.10558I$ | $-7.01188 - 1.87706I$ |
| $u = 1.002190 + 0.295542I$ $a = -1.263410 - 0.061767I$ $b = -1.122010 - 0.805060I$ | $-1.89061 - 2.95419I$ | $-3.50232 + 4.35344I$ |
| $u = 1.002190 - 0.295542I$ $a = 0.578212 - 1.125030I$ $b = -0.136196 - 1.374220I$ | $-1.89061 - 1.10558I$ | $-7.01188 + 1.87706I$ |
| $u = 1.002190 - 0.295542I$ $a = -1.263410 + 0.061767I$ $b = -1.122010 + 0.805060I$ | $-1.89061 + 2.95419I$ | $-3.50232 - 4.35344I$ |
| $u = -0.428243 + 0.664531I$ $a = 0.224551 + 0.930349I$ $b = 0.471538 - 0.368031I$ | $1.89061 + 1.10558I$ | $1.81693 - 2.49433I$ |
| $u = -0.428243 + 0.664531I$ $a = 0.693431 - 0.659641I$ $b = -0.554493 - 0.224349I$ | $1.89061 - 2.95419I$ | $-0.06995 + 4.17815I$ |
| $u = -0.428243 - 0.664531I$ $a = 0.224551 - 0.930349I$ $b = 0.471538 + 0.368031I$ | $1.89061 - 1.10558I$ | $1.81693 + 2.49433I$ |
| $u = -0.428243 - 0.664531I$ $a = 0.693431 + 0.659641I$ $b = -0.554493 + 0.224349I$ | $1.89061 + 2.95419I$ | $-0.06995 - 4.17815I$ |
| $u = -1.073950 + 0.558752I$ $a = -0.036219 + 0.825237I$ $b = 0.959936 + 0.737627I$ | $3.66314I$ | $-1.09315 - 2.75648I$ |
| $u = -1.073950 + 0.558752I$ $a = -0.696567 - 0.443985I$ $b = -1.118770 + 0.462515I$ | $7.72290I$ | $-4.13964 - 8.90605I$ |

| Solutions to I_2^u | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|-----------------------------|---------------------------------------|-----------------------|
| $u = -1.073950 - 0.558752I$ | | |
| $a = -0.036219 - 0.825237I$ | $- 3.66314I$ | $-1.09315 + 2.75648I$ |
| $b = 0.959936 - 0.737627I$ | | |
| $u = -1.073950 - 0.558752I$ | | |
| $a = -0.696567 + 0.443985I$ | $- 7.72290I$ | $-4.13964 + 8.90605I$ |
| $b = -1.118770 - 0.462515I$ | | |

III. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|------------|--|
| c_1 | $((u^2 - u + 1)^6)(u^{123} + 61u^{122} + \dots - 6u - 1)$ |
| c_2 | $((u^2 + u + 1)^6)(u^{123} + 7u^{122} + \dots + 8u + 1)$ |
| c_3 | $((u^2 - u + 1)^6)(u^{123} - 7u^{122} + \dots - 128330u + 93361)$ |
| c_4, c_8 | $u^{12}(u^{123} - u^{122} + \dots + 4096u + 4096)$ |
| c_5 | $((u^2 - u + 1)^6)(u^{123} + 7u^{122} + \dots + 8u + 1)$ |
| c_6 | $((u^6 - u^5 - u^4 + 2u^3 - u + 1)^2)(u^{123} - 3u^{122} + \dots - 10870u + 2425)$ |
| c_7 | $((u^6 + u^5 - u^4 - 2u^3 + u + 1)^2)(u^{123} + 3u^{122} + \dots + 2u + 1)$ |
| c_9 | $((u^6 - u^5 - u^4 + 2u^3 - u + 1)^2)(u^{123} + 13u^{122} + \dots + 429074u + 27289)$ |
| c_{10} | $((u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)^2)(u^{123} + 59u^{122} + \dots - 2u + 1)$ |
| c_{11} | $((u^6 - u^5 - u^4 + 2u^3 - u + 1)^2)(u^{123} + 3u^{122} + \dots + 2u + 1)$ |
| c_{12} | $(u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)^2$ $\cdot (u^{123} + 9u^{122} + \dots + 4066u + 1237)$ |

IV. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---------------|--|
| c_1 | $((y^2 + y + 1)^6)(y^{123} + 9y^{122} + \dots - 14y - 1)$ |
| c_2, c_5 | $((y^2 + y + 1)^6)(y^{123} + 61y^{122} + \dots - 6y - 1)$ |
| c_3 | $((y^2 + y + 1)^6)(y^{123} - 43y^{122} + \dots - 3.36523 \times 10^{10}y - 8.71628 \times 10^9)$ |
| c_4, c_8 | $y^{12}(y^{123} - 65y^{122} + \dots + 4.19430 \times 10^8y - 1.67772 \times 10^7)$ |
| c_6 | $(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$ $\cdot (y^{123} - 19y^{122} + \dots + 113874350y - 5880625)$ |
| c_7, c_{11} | $((y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2)(y^{123} - 59y^{122} + \dots - 2y - 1)$ |
| c_9 | $(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^2$ $\cdot (y^{123} + 41y^{122} + \dots - 732678681206y - 744689521)$ |
| c_{10} | $((y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2)(y^{123} + 13y^{122} + \dots - 14y - 1)$ |
| c_{12} | $(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^2$ $\cdot (y^{123} + 33y^{122} + \dots - 130598898y - 1530169)$ |