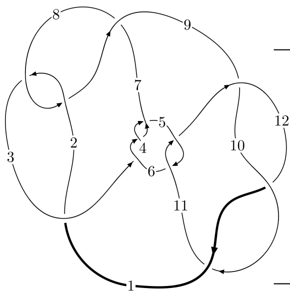
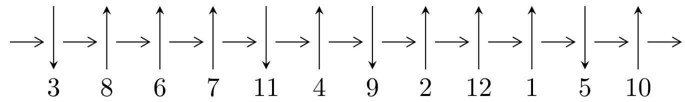
$12a_{0693}$ $(K12a_{0693})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &3.03402 \times 10^{43}u^{32} - 2.41482 \times 10^{44}u^{31} + \cdots + 8.30969 \times 10^{46}d - 2.35468 \times 10^{45},\\
&-1.63168 \times 10^{45}u^{32} + 5.79263 \times 10^{45}u^{31} + \cdots + 1.66194 \times 10^{47}c + 8.26721 \times 10^{46},\\
&2.98338 \times 10^{44}u^{32} - 6.07211 \times 10^{44}u^{31} + \cdots + 8.30969 \times 10^{46}b + 2.51360 \times 10^{46},\\
&1.47168 \times 10^{44}u^{32} - 3.80823 \times 10^{44}u^{31} + \cdots + 1.66194 \times 10^{47}a - 1.40982 \times 10^{47},\ u^{33} - 3u^{32} + \cdots - 32u +
\end{aligned}$$

$$\begin{aligned}
I_2^u = \langle &-43643176926349u^{24} - 6533209487727u^{23} + \cdots + 36953350808552d - 173010685681858,\\
&-25166501522073u^{24}a + 34404839224211u^{24} + \cdots - 99103984064754a + 136057334873306,\\
&-18554983719311u^{24}a + 8394493620023u^{24} + \cdots + 50333003044146a - 30523951539978,\\
&-86505342840929u^{24}a + 33387065157365u^{24} + \cdots + 716188465355062a - 526188833960766,\\
&u^{25} + u^{24} + \cdots + 4u - 4\rangle
\end{aligned}$$

$$I_1^v = \langle a,\ d,\ c - v,\ b + 1,\ v^2 - v + 1\rangle$$
$$I_2^v = \langle c,\ d + v - 1,\ b,\ a - 1,\ v^2 - v + 1\rangle$$
$$I_3^v = \langle a,\ d + 1,\ c - a + 1,\ b + 1,\ v + 1\rangle$$
$$\begin{aligned}
I_4^v = \langle &a,\ a^2d + c^2v - 2v^2c + v^3 + 2ca + cv - 2av - v^2 + a + v,\ dv - 1,\\
&c^2v^2 - 2v^3c + v^4 + 2cav + v^2c - 2v^2a - v^3 + a^2 + av + v^2,\ b + 1\rangle
\end{aligned}$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 88 representations.
* 1 irreducible components of $\dim_{\mathbb{C}} = 1$

[1]The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

I. $\boldsymbol{I^u_1 = \langle 3.03 \times 10^{43} u^{32} - 2.41 \times 10^{44} u^{31} + \cdots + 8.31 \times 10^{46} d - 2.35 \times 10^{45},\ -1.63 \times 10^{45} u^{32} + 5.79 \times 10^{45} u^{31} + \cdots + 1.66 \times 10^{47} c + 8.27 \times 10^{46},\ 2.98 \times 10^{44} u^{32} - 6.07 \times 10^{44} u^{31} + \cdots + 8.31 \times 10^{46} b + 2.51 \times 10^{46},\ 1.47 \times 10^{44} u^{32} - 3.81 \times 10^{44} u^{31} + \cdots + 1.66 \times 10^{47} a - 1.41 \times 10^{47},\ u^{33} - 3u^{32} + \cdots - 32u + 32 \rangle}$

(i) Arc colorings

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

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

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

$$a_{10} = \begin{pmatrix} 0.00981792u^{32} - 0.0348547u^{31} + \cdots + 1.28086u - 0.497444 \\ -0.000365118u^{32} + 0.00290603u^{31} + \cdots + 0.819964u + 0.0283366 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} -0.00945281u^{32} + 0.0319487u^{31} + \cdots - 2.10082u + 0.469107 \\ -0.000365118u^{32} + 0.00290603u^{31} + \cdots + 0.819964u + 0.0283366 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.000885519u^{32} + 0.00229144u^{31} + \cdots - 0.0914785u + 0.848301 \\ -0.00359025u^{32} + 0.00730726u^{31} + \cdots - 0.166618u - 0.302490 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.000885519u^{32} + 0.00229144u^{31} + \cdots - 0.0914785u + 0.848301 \\ 0.00540092u^{32} - 0.0113739u^{31} + \cdots + 0.183270u + 0.314174 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.00447577u^{32} + 0.00959870u^{31} + \cdots - 0.258096u + 0.545811 \\ 0.00661052u^{32} - 0.0132031u^{31} + \cdots + 0.187327u + 0.425005 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.0132814u^{32} - 0.0464547u^{31} + \cdots + 1.69824u - 0.612332 \\ -0.00382860u^{32} + 0.0145061u^{31} + \cdots + 0.402587u + 0.143225 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.0199599u^{32} + 0.0470707u^{31} + \cdots - 1.09062u + 0.264873 \\ 0.00406824u^{32} - 0.00955037u^{31} + \cdots - 0.124182u - 0.479897 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.0149968u^{32} + 0.0409221u^{31} + \cdots - 2.43207u + 0.604078 \\ -0.0128090u^{32} + 0.0440976u^{31} + \cdots - 0.373843u + 0.638717 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.0605080u^{32} - 0.0513753u^{31} + \cdots - 7.44134u + 11.1534$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$u^{33} + 11u^{32} + \cdots + 8u - 16$
c_2, c_8	$u^{33} + u^{32} + \cdots - 12u + 4$
c_3, c_4, c_6 c_9, c_{10}, c_{12}	$u^{33} + 5u^{32} + \cdots - 7u^2 - 1$
c_5, c_{11}	$u^{33} - 3u^{32} + \cdots - 32u + 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y^{33} + 23y^{32} + \cdots - 14304y - 256$
c_2, c_8	$y^{33} + 11y^{32} + \cdots + 8y - 16$
c_3, c_4, c_6 c_9, c_{10}, c_{12}	$y^{33} - 39y^{32} + \cdots - 14y - 1$
c_5, c_{11}	$y^{33} + 15y^{32} + \cdots - 6144y - 1024$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.979372 + 0.273800I$ $a = 0.431028 - 0.024061I$ $b = -1.312830 - 0.129109I$ $c = -1.70621 + 0.13086I$ $d = 0.428725 + 0.094450I$	$4.01193 + 3.40996I$	$6.93635 - 3.61829I$
$u = 0.979372 - 0.273800I$ $a = 0.431028 + 0.024061I$ $b = -1.312830 + 0.129109I$ $c = -1.70621 - 0.13086I$ $d = 0.428725 - 0.094450I$	$4.01193 - 3.40996I$	$6.93635 + 3.61829I$
$u = 0.581985 + 0.777781I$ $a = 0.666890 + 0.389948I$ $b = -0.117441 + 0.653397I$ $c = 0.381291 - 0.245865I$ $d = 0.084826 + 0.745638I$	$-3.19812 - 2.28214I$	$-2.55468 + 4.65224I$
$u = 0.581985 - 0.777781I$ $a = 0.666890 - 0.389948I$ $b = -0.117441 - 0.653397I$ $c = 0.381291 + 0.245865I$ $d = 0.084826 - 0.745638I$	$-3.19812 + 2.28214I$	$-2.55468 - 4.65224I$
$u = -0.342726 + 1.062970I$ $a = 0.557825 - 0.285941I$ $b = -0.419652 - 0.727712I$ $c = -0.617597 - 0.133391I$ $d = 0.112766 + 0.690951I$	$2.46500 + 1.75021I$	$7.36804 - 3.35767I$
$u = -0.342726 - 1.062970I$ $a = 0.557825 + 0.285941I$ $b = -0.419652 + 0.727712I$ $c = -0.617597 + 0.133391I$ $d = 0.112766 - 0.690951I$	$2.46500 - 1.75021I$	$7.36804 + 3.35767I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.16826$ $a = 0.415930$ $b = -1.40425$ $c = 1.68792$ $d = -0.485914$	7.47395	12.4850
$u = 0.464136 + 1.103860I$ $a = 0.545028 + 0.324179I$ $b = -0.355294 + 0.806119I$ $c = 0.610442 - 0.217661I$ $d = -0.104881 + 0.752097I$	$1.74788 - 7.33440I$	$5.47919 + 8.14278I$
$u = 0.464136 - 1.103860I$ $a = 0.545028 - 0.324179I$ $b = -0.355294 - 0.806119I$ $c = 0.610442 + 0.217661I$ $d = -0.104881 - 0.752097I$	$1.74788 + 7.33440I$	$5.47919 - 8.14278I$
$u = 0.635877 + 0.397843I$ $a = 0.923878 + 0.490787I$ $b = 0.155830 + 0.448444I$ $c = 0.101013 - 0.282995I$ $d = 0.392216 + 0.679638I$	$-0.42221 + 2.98824I$	$-0.68495 - 3.66701I$
$u = 0.635877 - 0.397843I$ $a = 0.923878 - 0.490787I$ $b = 0.155830 - 0.448444I$ $c = 0.101013 + 0.282995I$ $d = 0.392216 - 0.679638I$	$-0.42221 - 2.98824I$	$-0.68495 + 3.66701I$
$u = -0.239228 + 0.607577I$ $a = 0.750526 - 0.191152I$ $b = -0.251234 - 0.318679I$ $c = -0.249740 + 0.035069I$ $d = -0.063407 + 0.501731I$	$0.292144 + 0.942663I$	$5.66111 - 7.03214I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.239228 - 0.607577I$ $a = 0.750526 + 0.191152I$ $b = -0.251234 + 0.318679I$ $c = -0.249740 - 0.035069I$ $d = -0.063407 - 0.501731I$	$0.292144 - 0.942663I$	$5.66111 + 7.03214I$
$u = 0.351447 + 1.312440I$ $a = -1.87607 - 0.66709I$ $b = 1.47320 - 0.16826I$ $c = -0.05533 + 1.61726I$ $d = 0.21618 - 2.69668I$	$9.06107 - 0.86504I$	$11.01805 + 0.17133I$
$u = 0.351447 - 1.312440I$ $a = -1.87607 + 0.66709I$ $b = 1.47320 + 0.16826I$ $c = -0.05533 - 1.61726I$ $d = 0.21618 + 2.69668I$	$9.06107 + 0.86504I$	$11.01805 - 0.17133I$
$u = 0.611782 + 1.268620I$ $a = -1.54743 - 1.00939I$ $b = 1.45334 - 0.29571I$ $c = -0.07474 + 1.55998I$ $d = 0.33385 - 2.58063I$	$7.09875 - 9.27148I$	$8.26421 + 6.23171I$
$u = 0.611782 - 1.268620I$ $a = -1.54743 + 1.00939I$ $b = 1.45334 + 0.29571I$ $c = -0.07474 - 1.55998I$ $d = 0.33385 + 2.58063I$	$7.09875 + 9.27148I$	$8.26421 - 6.23171I$
$u = 0.053785 + 0.584876I$ $a = 0.567133 - 0.028165I$ $b = -0.758918 - 0.087353I$ $c = -0.313400 + 0.942882I$ $d = 0.046976 + 0.330187I$	$2.76296 + 2.31801I$	$12.30250 - 4.19824I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.053785 - 0.584876I$ $a = 0.567133 + 0.028165I$ $b = -0.758918 + 0.087353I$ $c = -0.313400 - 0.942882I$ $d = 0.046976 - 0.330187I$	$2.76296 - 2.31801I$	$12.30250 + 4.19824I$
$u = -1.38673 + 0.43185I$ $a = 0.395798 + 0.032608I$ $b = -1.50951 + 0.20675I$ $c = 1.59758 + 0.04740I$ $d = -0.562946 + 0.125707I$	$11.58920 - 2.62797I$	$12.22236 + 0.42879I$
$u = -1.38673 - 0.43185I$ $a = 0.395798 - 0.032608I$ $b = -1.50951 - 0.20675I$ $c = 1.59758 - 0.04740I$ $d = -0.562946 - 0.125707I$	$11.58920 + 2.62797I$	$12.22236 - 0.42879I$
$u = -0.489796 + 0.230188I$ $a = 1.111610 - 0.308664I$ $b = 0.164799 - 0.231913I$ $c = 0.015550 - 0.148753I$ $d = -0.473411 + 0.407061I$	$0.15528 + 1.56621I$	$-1.22779 - 2.98994I$
$u = -0.489796 - 0.230188I$ $a = 1.111610 + 0.308664I$ $b = 0.164799 + 0.231913I$ $c = 0.015550 + 0.148753I$ $d = -0.473411 - 0.407061I$	$0.15528 - 1.56621I$	$-1.22779 + 2.98994I$
$u = 1.35730 + 0.53891I$ $a = 0.396350 - 0.041125I$ $b = -1.49615 - 0.25900I$ $c = -1.57777 + 0.05545I$ $d = 0.560127 + 0.157777I$	$10.79550 + 8.72073I$	$10.94592 - 5.35160I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.35730 - 0.53891I$ $a = 0.396350 + 0.041125I$ $b = -1.49615 + 0.25900I$ $c = -1.57777 - 0.05545I$ $d = 0.560127 - 0.157777I$	$10.79550 - 8.72073I$	$10.94592 + 5.35160I$
$u = -0.48684 + 1.39736I$ $a = -1.61091 + 0.72954I$ $b = 1.51512 + 0.23328I$ $c = 0.04717 + 1.58742I$ $d = -0.23517 - 2.60619I$	$12.10590 + 5.85939I$	$13.7252 - 3.8290I$
$u = -0.48684 - 1.39736I$ $a = -1.61091 - 0.72954I$ $b = 1.51512 - 0.23328I$ $c = 0.04717 - 1.58742I$ $d = -0.23517 + 2.60619I$	$12.10590 - 5.85939I$	$13.7252 + 3.8290I$
$u = 0.82581 + 1.33817I$ $a = -1.22197 - 0.99602I$ $b = 1.49169 - 0.40077I$ $c = -0.04243 + 1.51660I$ $d = 0.32373 - 2.45773I$	$13.4411 - 16.4286I$	$10.77382 + 8.75984I$
$u = 0.82581 - 1.33817I$ $a = -1.22197 + 0.99602I$ $b = 1.49169 + 0.40077I$ $c = -0.04243 - 1.51660I$ $d = 0.32373 + 2.45773I$	$13.4411 + 16.4286I$	$10.77382 - 8.75984I$
$u = -0.77347 + 1.38729I$ $a = -1.27234 + 0.92357I$ $b = 1.51473 + 0.37364I$ $c = 0.03820 + 1.53196I$ $d = -0.29714 - 2.47946I$	$14.7439 + 10.2508I$	$12.57547 - 4.19472I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.77347-1.38729I$ $a=-1.27234-0.92357I$ $b=\ \ 1.51473-0.37364I$ $c=\ \ 0.03820-1.53196I$ $d=-0.29714+2.47946I$	$14.7439-10.2508I$	$12.57547+4.19472I$
$u=-0.05858+1.69521I$ $a=-1.52532+0.06419I$ $b=\ \ 1.65444+0.02754I$ $c=\ \ 0.00202+1.61414I$ $d=-0.01947-2.58949I$	$-19.6551+3.2714I$	$13.9526-2.4448I$
$u=-0.05858-1.69521I$ $a=-1.52532-0.06419I$ $b=\ \ 1.65444-0.02754I$ $c=\ \ 0.00202-1.61414I$ $d=-0.01947+2.58949I$	$-19.6551-3.2714I$	$13.9526+2.4448I$

II.
$$\boldsymbol{I_2^u = \langle -4.36\times 10^{13}u^{24} - 6.53\times 10^{12}u^{23} + \cdots + 3.70\times 10^{13}d - 1.73\times 10^{14},\ -2.52\times 10^{13}au^{24} + 3.44\times 10^{13}u^{24} + \cdots - 9.91\times 10^{13}a + 1.36\times 10^{14},\ -1.86\times 10^{13}au^{24} + 8.39\times 10^{12}u^{24} + \cdots + 5.03\times 10^{13}a - 3.05\times 10^{13},\ -8.65\times 10^{13}au^{24} + 3.34\times 10^{13}u^{24} + \cdots + 7.16\times 10^{14}a - 5.26\times 10^{14},\ u^{25} + u^{24} + \cdots + 4u - 4\rangle}$$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.681034au^{24} - 0.931034u^{24} + \cdots + 2.68187a - 3.68187 \\ 1.18103u^{24} + 0.176796u^{23} + \cdots - 14.3723u + 4.68187 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.681034au^{24} - 0.250000u^{24} + \cdots - 2.68187a - 1 \\ 1.18103u^{24} + 0.176796u^{23} + \cdots - 14.3723u + 4.68187 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a \\ 1.00424au^{24} - 0.454329u^{24} + \cdots - 2.72414a + 1.65203 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a \\ -1.00424au^{24} + 0.454329u^{24} + \cdots + 2.72414a - 1.65203 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1.00424au^{24} - 0.454329u^{24} + \cdots - 1.72414a + 1.65203 \\ -1.99712au^{24} + 0.930056u^{24} + \cdots + 4.50730a - 3.40772 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1.12683au^{24} - 0.931034u^{24} + \cdots + 6.69882a - 3.68187 \\ -0.445792au^{24} + 1.18103u^{24} + \cdots - 4.01695a + 4.68187 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -2.44203au^{24} + 1.16427u^{24} + \cdots + 6.39909a + 0.185751 \\ 2.42063au^{24} - 1.33567u^{24} + \cdots - 6.29543a - 3.15467 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -1.57386au^{24} + 0.195792u^{24} + \cdots - 7.91615a + 3.01695 \\ 0.638749au^{24} + 0.561007u^{24} + \cdots + 9.76810a - 3.30659 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{6062761600965}{9238337702138}u^{24} + \frac{3225176474347}{9238337702138}u^{23} + \cdots + \frac{61042729884201}{9238337702138}u + \frac{27155343409896}{4619168851069}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$(u^{25}+8u^{24}+\cdots+11u-1)^2$
c_2	$(u^{25}+2u^{24}+\cdots+3u+1)^2$
c_3, c_4, c_9	$u^{50}+3u^{49}+\cdots+24u-16$
c_5	$(u^{25}+u^{24}+\cdots+4u-4)^2$
c_6, c_{10}, c_{12}	$-u^{50}+3u^{49}+\cdots+24u+16$
c_8	$(u^{25}-2u^{24}+\cdots+3u-1)^2$
c_{11}	$(u^{25}-u^{24}+\cdots+4u+4)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$(y^{25} + 20y^{24} + \cdots + 251y - 1)^2$
c_2, c_8	$(y^{25} + 8y^{24} + \cdots + 11y - 1)^2$
c_3, c_4, c_6 c_9, c_{10}, c_{12}	$y^{50} - 39y^{49} + \cdots - 3872y + 256$
c_5, c_{11}	$(y^{25} + 15y^{24} + \cdots - 88y - 16)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.111975 + 0.962557I$ $a = 0.567856 - 0.205094I$ $b = -0.557801 - 0.562636I$ $c = 0.819383 + 0.216893I$ $d = -0.206986 + 0.489964I$	$3.08820 + 2.66172I$	$9.28523 - 3.57661I$
$u = -0.111975 + 0.962557I$ $a = 0.526908 + 0.153743I$ $b = -0.748963 + 0.510317I$ $c = -0.644034 + 0.069293I$ $d = 0.133829 + 0.569559I$	$3.08820 + 2.66172I$	$9.28523 - 3.57661I$
$u = -0.111975 - 0.962557I$ $a = 0.567856 + 0.205094I$ $b = -0.557801 + 0.562636I$ $c = 0.819383 - 0.216893I$ $d = -0.206986 - 0.489964I$	$3.08820 - 2.66172I$	$9.28523 + 3.57661I$
$u = -0.111975 - 0.962557I$ $a = 0.526908 - 0.153743I$ $b = -0.748963 - 0.510317I$ $c = -0.644034 - 0.069293I$ $d = 0.133829 - 0.569559I$	$3.08820 - 2.66172I$	$9.28523 + 3.57661I$
$u = 1.061780 + 0.135314I$ $a = 0.707086 + 1.072640I$ $b = 0.571600 + 0.649877I$ $c = -1.71425 + 0.05535I$ $d = 0.452395 + 0.045198I$	$4.81480 - 0.43356I$	$8.91196 - 0.04506I$
$u = 1.061780 + 0.135314I$ $a = 0.424600 - 0.011543I$ $b = -1.353420 - 0.063981I$ $c = 0.000864 - 0.699820I$ $d = 0.605628 + 1.234590I$	$4.81480 - 0.43356I$	$8.91196 - 0.04506I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.061780 - 0.135314I$ $a = 0.707086 - 1.072640I$ $b = 0.571600 - 0.649877I$ $c = -1.71425 - 0.05535I$ $d = 0.452395 - 0.045198I$	$4.81480 + 0.43356I$	$8.91196 + 0.04506I$
$u = 1.061780 - 0.135314I$ $a = 0.424600 + 0.011543I$ $b = -1.353420 + 0.063981I$ $c = 0.000864 + 0.699820I$ $d = 0.605628 - 1.234590I$	$4.81480 + 0.43356I$	$8.91196 + 0.04506I$
$u = -0.465035 + 1.033020I$ $a = 0.568091 - 0.326292I$ $b = -0.323623 - 0.760243I$ $c = 0.14931 + 1.61347I$ $d = -0.45403 - 2.76996I$	$1.37392 + 5.41987I$	$4.64303 - 6.54919I$
$u = -0.465035 + 1.033020I$ $a = -2.06507 + 1.36916I$ $b = 1.336380 + 0.223022I$ $c = -0.567551 - 0.202618I$ $d = 0.072882 + 0.738584I$	$1.37392 + 5.41987I$	$4.64303 - 6.54919I$
$u = -0.465035 - 1.033020I$ $a = 0.568091 + 0.326292I$ $b = -0.323623 + 0.760243I$ $c = 0.14931 - 1.61347I$ $d = -0.45403 + 2.76996I$	$1.37392 - 5.41987I$	$4.64303 + 6.54919I$
$u = -0.465035 - 1.033020I$ $a = -2.06507 - 1.36916I$ $b = 1.336380 - 0.223022I$ $c = -0.567551 + 0.202618I$ $d = 0.072882 - 0.738584I$	$1.37392 - 5.41987I$	$4.64303 + 6.54919I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.096160+0.296196I$ $a=\ \ 0.650082-0.890833I$ $b=\ \ 0.465476-0.732479I$ $c=\ \ 1.66469+0.09733I$ $d=-0.468544+0.097124I$	$4.43073-5.11531I$	$7.81745+5.48464I$
$u=-1.096160+0.296196I$ $a=\ \ 0.420667+0.025066I$ $b=-1.368770+0.141145I$ $c=-0.115286-0.653233I$ $d=-0.448735+1.169050I$	$4.43073-5.11531I$	$7.81745+5.48464I$
$u=-1.096160-0.296196I$ $a=\ \ 0.650082+0.890833I$ $b=\ \ 0.465476+0.732479I$ $c=\ \ 1.66469-0.09733I$ $d=-0.468544-0.097124I$	$4.43073+5.11531I$	$7.81745-5.48464I$
$u=-1.096160-0.296196I$ $a=\ \ 0.420667-0.025066I$ $b=-1.368770-0.141145I$ $c=-0.115286+0.653233I$ $d=-0.448735-1.169050I$	$4.43073+5.11531I$	$7.81745-5.48464I$
$u=\ \ 0.202658+1.122680I$ $a=\ \ 0.533156+0.248104I$ $b=-0.541755+0.717454I$ $c=-0.06617+1.68118I$ $d=\ \ 0.19823-2.88839I$	$5.39169-2.44039I$	$11.83401+3.61173I$
$u=\ \ 0.202658+1.122680I$ $a=-2.46070-0.62076I$ $b=\ \ 1.382070-0.096385I$ $c=\ \ 0.705023-0.069800I$ $d=-0.170493+0.648845I$	$5.39169-2.44039I$	$11.83401+3.61173I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.202658 - 1.122680I$ $a = 0.533156 - 0.248104I$ $b = -0.541755 - 0.717454I$ $c = -0.06617 - 1.68118I$ $d = 0.19823 + 2.88839I$	$5.39169 + 2.44039I$	$11.83401 - 3.61173I$
$u = 0.202658 - 1.122680I$ $a = -2.46070 + 0.62076I$ $b = 1.382070 + 0.096385I$ $c = 0.705023 + 0.069800I$ $d = -0.170493 - 0.648845I$	$5.39169 + 2.44039I$	$11.83401 - 3.61173I$
$u = -0.641188 + 0.544744I$ $a = 0.797389 - 0.461643I$ $b = 0.060728 - 0.543785I$ $c = 1.54551 + 0.43011I$ $d = -0.325741 + 0.217121I$	$-0.175498 - 1.059220I$	$0.606046 + 0.370576I$
$u = -0.641188 + 0.544744I$ $a = 0.462143 + 0.054007I$ $b = -1.134680 + 0.249465I$ $c = -0.213681 - 0.284545I$ $d = -0.259799 + 0.730373I$	$-0.175498 - 1.059220I$	$0.606046 + 0.370576I$
$u = -0.641188 - 0.544744I$ $a = 0.797389 + 0.461643I$ $b = 0.060728 + 0.543785I$ $c = 1.54551 - 0.43011I$ $d = -0.325741 - 0.217121I$	$-0.175498 + 1.059220I$	$0.606046 - 0.370576I$
$u = -0.641188 - 0.544744I$ $a = 0.462143 - 0.054007I$ $b = -1.134680 - 0.249465I$ $c = -0.213681 + 0.284545I$ $d = -0.259799 - 0.730373I$	$-0.175498 + 1.059220I$	$0.606046 - 0.370576I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.082989 + 0.805818I$ $a = 0.611223 - 0.162597I$ $b = -0.527939 - 0.406461I$ $c = 0.07908 + 1.88202I$ $d = -0.18925 - 3.40293I$	$2.66645 - 1.39976I$	$8.95722 + 0.06062I$
$u = -0.082989 + 0.805818I$ $a = -4.15470 + 0.66274I$ $b = 1.234720 + 0.037441I$ $c = -0.512649 + 0.193657I$ $d = 0.080299 + 0.506028I$	$2.66645 - 1.39976I$	$8.95722 + 0.06062I$
$u = -0.082989 - 0.805818I$ $a = 0.611223 + 0.162597I$ $b = -0.527939 + 0.406461I$ $c = 0.07908 - 1.88202I$ $d = -0.18925 + 3.40293I$	$2.66645 + 1.39976I$	$8.95722 - 0.06062I$
$u = -0.082989 - 0.805818I$ $a = -4.15470 - 0.66274I$ $b = 1.234720 - 0.037441I$ $c = -0.512649 - 0.193657I$ $d = 0.080299 - 0.506028I$	$2.66645 + 1.39976I$	$8.95722 - 0.06062I$
$u = 0.340493 + 0.559321I$ $a = 0.502139 - 0.055131I$ $b = -0.967761 - 0.216045I$ $c = -0.55582 + 1.83765I$ $d = 1.25446 - 3.40093I$	$2.95409 - 1.50728I$	$9.02072 + 4.31266I$
$u = 0.340493 + 0.559321I$ $a = -3.44021 - 4.33709I$ $b = 1.112260 - 0.141525I$ $c = -1.25214 + 0.82876I$ $d = 0.201811 + 0.262085I$	$2.95409 - 1.50728I$	$9.02072 + 4.31266I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.340493 - 0.559321I$ $a = 0.502139 + 0.055131I$ $b = -0.967761 + 0.216045I$ $c = -0.55582 - 1.83765I$ $d = 1.25446 + 3.40093I$	$2.95409 + 1.50728I$	$9.02072 - 4.31266I$
$u = 0.340493 - 0.559321I$ $a = -3.44021 + 4.33709I$ $b = 1.112260 + 0.141525I$ $c = -1.25214 - 0.82876I$ $d = 0.201811 - 0.262085I$	$2.95409 + 1.50728I$	$9.02072 - 4.31266I$
$u = -0.291960 + 1.368920I$ $a = 0.445605 + 0.177592I$ $b = -0.936546 + 0.771795I$ $c = 0.04016 + 1.62132I$ $d = -0.16630 - 2.69033I$	$10.21860 - 0.59688I$	$12.46758 + 1.80507I$
$u = -0.291960 + 1.368920I$ $a = -1.85501 + 0.51711I$ $b = 1.50021 + 0.13944I$ $c = 1.052040 - 0.018777I$ $d = -0.373208 + 0.558147I$	$10.21860 - 0.59688I$	$12.46758 + 1.80507I$
$u = -0.291960 - 1.368920I$ $a = 0.445605 - 0.177592I$ $b = -0.936546 - 0.771795I$ $c = 0.04016 - 1.62132I$ $d = -0.16630 + 2.69033I$	$10.21860 + 0.59688I$	$12.46758 - 1.80507I$
$u = -0.291960 - 1.368920I$ $a = -1.85501 - 0.51711I$ $b = 1.50021 - 0.13944I$ $c = 1.052040 + 0.018777I$ $d = -0.373208 - 0.558147I$	$10.21860 + 0.59688I$	$12.46758 - 1.80507I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.414621 + 1.342760I$ $a = 0.438582 - 0.161155I$ $b = -1.008850 - 0.738143I$ $c = -0.05457 + 1.60297I$ $d = 0.23190 - 2.65647I$	$9.63785 - 5.44271I$	$11.50171 + 3.51350I$
$u = 0.414621 + 1.342760I$ $a = -1.75747 - 0.71538I$ $b = 1.48812 - 0.19869I$ $c = -1.111910 + 0.008864I$ $d = 0.398238 + 0.522092I$	$9.63785 - 5.44271I$	$11.50171 + 3.51350I$
$u = 0.414621 - 1.342760I$ $a = 0.438582 + 0.161155I$ $b = -1.008850 + 0.738143I$ $c = -0.05457 - 1.60297I$ $d = 0.23190 + 2.65647I$	$9.63785 + 5.44271I$	$11.50171 - 3.51350I$
$u = 0.414621 - 1.342760I$ $a = -1.75747 + 0.71538I$ $b = 1.48812 + 0.19869I$ $c = -1.111910 - 0.008864I$ $d = 0.398238 - 0.522092I$	$9.63785 + 5.44271I$	$11.50171 - 3.51350I$
$u = 0.55118 + 1.32473I$ $a = 0.481455 + 0.338042I$ $b = -0.391201 + 0.976798I$ $c = -0.06239 + 1.57516I$ $d = 0.28799 - 2.59876I$	$8.61369 - 5.36637I$	$10.46678 + 3.05337I$
$u = 0.55118 + 1.32473I$ $a = -1.59514 - 0.88109I$ $b = 1.48035 - 0.26533I$ $c = 0.706254 - 0.310872I$ $d = -0.182445 + 0.824120I$	$8.61369 - 5.36637I$	$10.46678 + 3.05337I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=\ \ 0.55118-1.32473I$ $a=\ \ 0.481455-0.338042I$ $b=-0.391201-0.976798I$ $c=-0.06239-1.57516I$ $d=\ \ 0.28799+2.59876I$	$8.61369+5.36637I$	$10.46678-3.05337I$
$u=\ \ 0.55118-1.32473I$ $a=-1.59514+0.88109I$ $b=\ \ 1.48035+0.26533I$ $c=\ \ 0.706254+0.310872I$ $d=-0.182445-0.824120I$	$8.61369+5.36637I$	$10.46678-3.05337I$
$u=-0.64072+1.29917I$ $a=\ \ 0.481272-0.361055I$ $b=-0.329543-0.997435I$ $c=\ \ 0.06623+1.55407I$ $d=-0.32299-2.55800I$	$7.62261+11.39030I$	$8.71017-7.76664I$
$u=-0.64072+1.29917I$ $a=-1.48513+0.98104I$ $b=\ \ 1.46878+0.30967I$ $c=-0.677635-0.347996I$ $d=\ \ 0.160711+0.856587I$	$7.62261+11.39030I$	$8.71017-7.76664I$
$u=-0.64072-1.29917I$ $a=\ \ 0.481272+0.361055I$ $b=-0.329543+0.997435I$ $c=\ \ 0.06623-1.55407I$ $d=-0.32299+2.55800I$	$7.62261-11.39030I$	$8.71017+7.76664I$
$u=-0.64072-1.29917I$ $a=-1.48513-0.98104I$ $b=\ \ 1.46878-0.30967I$ $c=-0.677635+0.347996I$ $d=\ \ 0.160711-0.856587I$	$7.62261-11.39030I$	$8.71017+7.76664I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.518583$ $a = 1.41735$ $b = 0.294460$ $c = -2.39378$ $d = 0.245289$	2.09579	3.55620
$u = 0.518583$ $a = 0.472999$ $b = -1.11417$ $c = -0.167199$ $d = 0.735015$	2.09579	3.55620

III. $\boldsymbol{I_1^v = \langle a,\ d,\ c - v,\ b + 1,\ v^2 - v + 1 \rangle}$

(i) Arc colorings

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

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

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

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

$$a_{12} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

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

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

$$a_3 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} v - 1 \\ -1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} v \\ v \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4v + 1$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 0.500000 + 0.866025I$ $a = 0$ $b = -1.00000$ $c = 0.500000 + 0.866025I$ $d = 0$	$1.64493 - 2.02988I$	$3.00000 + 3.46410I$
$v = 0.500000 - 0.866025I$ $a = 0$ $b = -1.00000$ $c = 0.500000 - 0.866025I$ $d = 0$	$1.64493 + 2.02988I$	$3.00000 - 3.46410I$

IV. $I_2^v = \langle c,\ d+v-1,\ b,\ a-1,\ v^2-v+1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ -v+1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} v \\ v-1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -v \\ -v+1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ -v \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ v-1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4v+5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_2^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	$0.500000 + 0.866025I$		
$a =$	1.00000		
$b =$	0	$1.64493 + 2.02988I$	$3.00000 - 3.46410I$
$c =$	0		
$d =$	$0.500000 - 0.866025I$		
$v =$	$0.500000 - 0.866025I$		
$a =$	1.00000		
$b =$	0	$1.64493 - 2.02988I$	$3.00000 + 3.46410I$
$c =$	0		
$d =$	$0.500000 + 0.866025I$		

V. $I_3^v = \langle a,\ d+1,\ c-a+1,\ b+1,\ v+1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = -1.00000$ $a = \quad 0$ $b = -1.00000$ $c = -1.00000$ $d = -1.00000$	3.28987	12.0000

VI.

$$\boldsymbol{I_4^v = \langle a,\ -2v^2c+v^3+\cdots+2ca+a,\ dv-1,\ -2v^3c+v^4+\cdots+a^2+av,\ b+1\rangle}$$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} c \\ d \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -c+v \\ -d \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} c-v \\ d \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -c+v-1 \\ dc-2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -c+v \\ -d-c+v \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= d^2+v^2-4c+4v+8$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_4^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = \cdots$		
$a = \cdots$		
$b = \cdots$	$3.28987 + 2.02988I$	$11.78425 + 3.62207I$
$c = \cdots$		
$d = \cdots$		

VII. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_7	$u(u^2-u+1)^2(u^{33}+11u^{32}+\cdots+8u-16)$
c_2, c_8	$u(u^2-u+1)(u^2+u+1)(u^{33}+u^{32}+\cdots-12u+4)$
c_3, c_4, c_9 c_{10}	$u^2(u+1)^3(u^{33}+5u^{32}+\cdots-7u^2-1)$
c_5, c_{11}	$u^5(u^{33}-3u^{32}+\cdots-32u+32)$
c_6, c_{12}	$u^2(u-1)^3(u^{33}+5u^{32}+\cdots-7u^2-1)$

VIII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y(y^2+y+1)^2(y^{33}+23y^{32}+\cdots-14304y-256)$
c_2, c_8	$y(y^2+y+1)^2(y^{33}+11y^{32}+\cdots+8y-16)$
c_3, c_4, c_6 c_9, c_{10}, c_{12}	$y^2(y-1)^3(y^{33}-39y^{32}+\cdots-14y-1)$
c_5, c_{11}	$y^5(y^{33}+15y^{32}+\cdots-6144y-1024)$