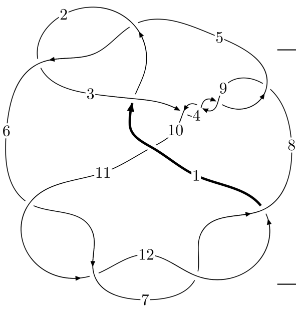
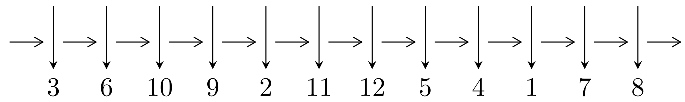
$12a_{0442}$ $(K12a_{0442})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -1.34896 \times 10^{18} u^{56} + 2.07087 \times 10^{18} u^{55} + \cdots + 5.37832 \times 10^{18} b + 3.89959 \times 10^{18},$$
$$1.80814 \times 10^{19} u^{56} - 2.72100 \times 10^{19} u^{55} + \cdots + 3.22699 \times 10^{19} a - 1.14340 \times 10^{20},\ u^{57} - 2u^{56} + \cdots + 3u + 3$$
$$I_2^u = \langle b + 1,\ a + 1,\ u^2 + u - 1 \rangle$$
$$I_3^u = \langle b - 1,\ a^2 - 2a - 2u + 5,\ u^2 - u - 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 63 representations.

[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`).

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

I.

$$I_1^u = \langle -1.35\times10^{18}u^{56}+2.07\times10^{18}u^{55}+\cdots+5.38\times10^{18}b+3.90\times10^{18},\ 1.81\times10^{19}u^{56}-2.72\times10^{19}u^{55}+\cdots+3.23\times10^{19}a-1.14\times10^{20},\ u^{57}-2u^{56}+\cdots+3u+3\rangle$$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.560318u^{56}+0.843200u^{55}+\cdots+3.40907u+3.54324\\0.250815u^{56}-0.385040u^{55}+\cdots-0.856790u-0.725058\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-0.309503u^{56}+0.458160u^{55}+\cdots+2.55228u+2.81818\\0.250815u^{56}-0.385040u^{55}+\cdots-0.856790u-0.725058\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^3-2u\\u^5-3u^3+u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0.171913u^{56}-0.402348u^{55}+\cdots-5.30776u-1.55172\\-0.0224250u^{56}+0.0733178u^{55}+\cdots+1.08954u-0.313317\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-1.20094u^{56}+0.0915331u^{55}+\cdots+12.1379u+5.33793\\-0.604807u^{56}-0.136946u^{55}+\cdots-0.482139u+1.18193\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-0.837757u^{56}+1.11941u^{55}+\cdots+4.97460u+4.32404\\0.144564u^{56}-0.142864u^{55}+\cdots+0.629938u-0.344274\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^7-4u^5+4u^3\\u^9-5u^7+7u^5-2u^3+u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{826313162299306861}{537832304913260854 1}u^{56}-\frac{1448839852347394239}{5378323049132608541}u^{55}+\cdots+\frac{11912765712166984528}{5378323049132608541}u-\frac{10741812621294790880 1}{5378323049132608541}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{57} + 27u^{56} + \cdots + 3644u + 121$
c_2, c_5	$u^{57} + 3u^{56} + \cdots + 50u + 11$
c_3, c_4, c_8 c_9	$u^{57} + u^{56} + \cdots + 16u + 4$
c_6, c_7, c_{11} c_{12}	$u^{57} - 2u^{56} + \cdots + 3u + 3$
c_{10}	$u^{57} - 14u^{56} + \cdots - 681u + 369$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{57} + 13y^{56} + \cdots + 4124360y - 14641$
c_2, c_5	$y^{57} - 27y^{56} + \cdots + 3644y - 121$
c_3, c_4, c_8 c_9	$y^{57} + 67y^{56} + \cdots - 64y - 16$
c_6, c_7, c_{11} c_{12}	$y^{57} - 66y^{56} + \cdots + 183y - 9$
c_{10}	$y^{57} + 6y^{56} + \cdots + 3023883y - 136161$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.704131+0.589103I$ $a=-0.55492-1.95508I$ $b=-1.137580+0.679596I$	$8.22701+10.27850I$	$-9.75435-7.77331I$
$u=-0.704131-0.589103I$ $a=-0.55492+1.95508I$ $b=-1.137580-0.679596I$	$8.22701-10.27850I$	$-9.75435+7.77331I$
$u=1.076280+0.226599I$ $a=-0.275618-0.007670I$ $b=-0.916195+0.661079I$	$5.36877+2.70273I$	0
$u=1.076280-0.226599I$ $a=-0.275618+0.007670I$ $b=-0.916195-0.661079I$	$5.36877-2.70273I$	0
$u=-0.864189+0.160463I$ $a=0.551285+0.098003I$ $b=0.901677+0.376998I$	$-2.19905-1.48805I$	$-14.3910+4.5059I$
$u=-0.864189-0.160463I$ $a=0.551285-0.098003I$ $b=0.901677-0.376998I$	$-2.19905+1.48805I$	$-14.3910-4.5059I$
$u=-0.616683+0.599939I$ $a=0.971008+0.626841I$ $b=-0.464660-0.924311I$	$10.27110+4.39988I$	$-6.95656-3.67714I$
$u=-0.616683-0.599939I$ $a=0.971008-0.626841I$ $b=-0.464660+0.924311I$	$10.27110-4.39988I$	$-6.95656+3.67714I$
$u=0.663557+0.528050I$ $a=0.46790-2.15581I$ $b=1.061910+0.603362I$	$0.29697-7.63210I$	$-12.1110+9.6571I$
$u=0.663557-0.528050I$ $a=0.46790+2.15581I$ $b=1.061910-0.603362I$	$0.29697+7.63210I$	$-12.1110-9.6571I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.595377 + 0.457995I$ $a = -0.17328 - 2.41340I$ $b = -0.951412 + 0.515712I$	$-1.24820 + 3.57057I$	$-14.6209 - 5.6248I$
$u = -0.595377 - 0.457995I$ $a = -0.17328 + 2.41340I$ $b = -0.951412 - 0.515712I$	$-1.24820 - 3.57057I$	$-14.6209 + 5.6248I$
$u = -0.342193 + 0.661292I$ $a = 0.03195 - 1.59816I$ $b = -0.580638 + 0.877264I$	$11.08210 - 0.14823I$	$-5.35375 - 2.36234I$
$u = -0.342193 - 0.661292I$ $a = 0.03195 + 1.59816I$ $b = -0.580638 - 0.877264I$	$11.08210 + 0.14823I$	$-5.35375 + 2.36234I$
$u = 0.554979 + 0.489624I$ $a = -1.094900 + 0.593600I$ $b = 0.455941 - 0.705482I$	$2.03839 - 2.59914I$	$-8.23652 + 5.38103I$
$u = 0.554979 - 0.489624I$ $a = -1.094900 - 0.593600I$ $b = 0.455941 + 0.705482I$	$2.03839 + 2.59914I$	$-8.23652 - 5.38103I$
$u = -0.235908 + 0.693140I$ $a = 0.858831 + 1.042160I$ $b = -1.063010 - 0.700463I$	$9.61427 - 5.97551I$	$-6.95096 + 2.88432I$
$u = -0.235908 - 0.693140I$ $a = 0.858831 - 1.042160I$ $b = -1.063010 + 0.700463I$	$9.61427 + 5.97551I$	$-6.95096 - 2.88432I$
$u = -0.496534 + 0.436861I$ $a = 0.496412 + 0.893237I$ $b = 1.299830 + 0.083523I$	$3.92009 + 1.55212I$	$-10.02210 - 4.28622I$
$u = -0.496534 - 0.436861I$ $a = 0.496412 - 0.893237I$ $b = 1.299830 - 0.083523I$	$3.92009 - 1.55212I$	$-10.02210 + 4.28622I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.335210 + 0.150895I$ $a = -0.452216 + 0.700456I$ $b = -0.764404 - 0.811299I$	$5.80019 - 2.81830I$	0
$u = 1.335210 - 0.150895I$ $a = -0.452216 - 0.700456I$ $b = -0.764404 + 0.811299I$	$5.80019 + 2.81830I$	0
$u = 0.603584 + 0.236433I$ $a = -0.804681 + 0.489871I$ $b = -1.119030 + 0.142393I$	$-2.75711 - 0.66564I$	$-14.7826 + 9.4775I$
$u = 0.603584 - 0.236433I$ $a = -0.804681 - 0.489871I$ $b = -1.119030 - 0.142393I$	$-2.75711 + 0.66564I$	$-14.7826 - 9.4775I$
$u = 0.239924 + 0.586288I$ $a = -1.02557 + 1.13352I$ $b = 0.966676 - 0.579065I$	$1.52522 + 3.82244I$	$-8.59714 - 4.32635I$
$u = 0.239924 - 0.586288I$ $a = -1.02557 - 1.13352I$ $b = 0.966676 + 0.579065I$	$1.52522 - 3.82244I$	$-8.59714 + 4.32635I$
$u = 0.363750 + 0.490876I$ $a = -0.32703 - 1.72685I$ $b = 0.591846 + 0.590762I$	$2.57252 - 0.84095I$	$-6.12773 + 3.38170I$
$u = 0.363750 - 0.490876I$ $a = -0.32703 + 1.72685I$ $b = 0.591846 - 0.590762I$	$2.57252 + 0.84095I$	$-6.12773 - 3.38170I$
$u = 0.468640 + 0.278951I$ $a = -1.53706 - 2.70780I$ $b = 0.779461 + 0.243702I$	$3.07197 - 1.00767I$	$-8.24371 + 7.05136I$
$u = 0.468640 - 0.278951I$ $a = -1.53706 + 2.70780I$ $b = 0.779461 - 0.243702I$	$3.07197 + 1.00767I$	$-8.24371 - 7.05136I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.46667 + 0.00945I$ $a = -0.143513 + 0.884230I$ $b = 0.701842 - 0.637996I$	$-3.17986 + 2.29539I$	0
$u = -1.46667 - 0.00945I$ $a = -0.143513 - 0.884230I$ $b = 0.701842 + 0.637996I$	$-3.17986 - 2.29539I$	0
$u = -0.320993 + 0.413524I$ $a = 1.53117 + 0.94240I$ $b = -0.744681 - 0.411258I$	$-0.459717 - 0.404026I$	$-12.49447 - 1.15280I$
$u = -0.320993 - 0.413524I$ $a = 1.53117 - 0.94240I$ $b = -0.744681 + 0.411258I$	$-0.459717 + 0.404026I$	$-12.49447 + 1.15280I$
$u = 1.52983 + 0.07395I$ $a = 0.533941 - 0.495207I$ $b = -0.455361 + 0.657851I$	$-6.82775 - 0.90726I$	0
$u = 1.52983 - 0.07395I$ $a = 0.533941 + 0.495207I$ $b = -0.455361 - 0.657851I$	$-6.82775 + 0.90726I$	0
$u = -1.53547 + 0.08531I$ $a = 0.24044 + 1.57007I$ $b = 0.906529 - 0.539225I$	$-3.70478 + 2.30339I$	0
$u = -1.53547 - 0.08531I$ $a = 0.24044 - 1.57007I$ $b = 0.906529 + 0.539225I$	$-3.70478 - 2.30339I$	0
$u = 1.54418 + 0.11457I$ $a = 1.146410 - 0.213923I$ $b = 1.364410 - 0.193878I$	$-2.97244 - 3.47012I$	0
$u = 1.54418 - 0.11457I$ $a = 1.146410 + 0.213923I$ $b = 1.364410 + 0.193878I$	$-2.97244 + 3.47012I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.55226 + 0.13383I$ $a = -0.483951 - 0.274353I$ $b = 0.366394 + 0.829437I$	$-5.02892 + 4.81975I$	0
$u = -1.55226 - 0.13383I$ $a = -0.483951 + 0.274353I$ $b = 0.366394 - 0.829437I$	$-5.02892 - 4.81975I$	0
$u = 1.56988 + 0.13059I$ $a = -0.77974 + 1.54885I$ $b = -1.055050 - 0.572617I$	$-8.56290 - 5.70715I$	0
$u = 1.56988 - 0.13059I$ $a = -0.77974 - 1.54885I$ $b = -1.055050 + 0.572617I$	$-8.56290 + 5.70715I$	0
$u = 1.56630 + 0.18220I$ $a = 0.438140 - 0.169691I$ $b = -0.359969 + 0.971927I$	$2.99794 - 7.27238I$	0
$u = 1.56630 - 0.18220I$ $a = 0.438140 + 0.169691I$ $b = -0.359969 - 0.971927I$	$2.99794 + 7.27238I$	0
$u = -1.58131 + 0.07034I$ $a = -1.081170 - 0.135333I$ $b = -1.236560 - 0.191168I$	$-10.26270 + 1.82090I$	0
$u = -1.58131 - 0.07034I$ $a = -1.081170 + 0.135333I$ $b = -1.236560 + 0.191168I$	$-10.26270 - 1.82090I$	0
$u = -1.58968 + 0.15765I$ $a = 0.98367 + 1.39881I$ $b = 1.133960 - 0.611529I$	$-7.29789 + 10.17520I$	0
$u = -1.58968 - 0.15765I$ $a = 0.98367 - 1.39881I$ $b = 1.133960 + 0.611529I$	$-7.29789 - 10.17520I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.60528 + 0.18171I$ $a = -1.07959 + 1.25671I$ $b = -1.194090 - 0.654261I$	$0.45530 - 13.17410I$	0
$u = 1.60528 - 0.18171I$ $a = -1.07959 - 1.25671I$ $b = -1.194090 + 0.654261I$	$0.45530 + 13.17410I$	0
$u = 1.63713 + 0.03909I$ $a = 0.969700 - 0.089889I$ $b = 1.003290 - 0.255169I$	$-10.78670 + 0.74355I$	0
$u = 1.63713 - 0.03909I$ $a = 0.969700 + 0.089889I$ $b = 1.003290 + 0.255169I$	$-10.78670 - 0.74355I$	0
$u = -0.355161$ $a = 0.961312$ $b = -0.240286$	-0.558297	-17.5620
$u = -1.67953 + 0.03241I$ $a = -0.888295 - 0.107233I$ $b = -0.870985 - 0.473795I$	$-4.14213 - 1.93573I$	0
$u = -1.67953 - 0.03241I$ $a = -0.888295 + 0.107233I$ $b = -0.870985 + 0.473795I$	$-4.14213 + 1.93573I$	0

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

(i) Arc colorings

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

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

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

$$a_{12} = \begin{pmatrix} -u \\ -u+1 \end{pmatrix}$$

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

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

$$a_2 = \begin{pmatrix} -2 \\ -1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -14$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.618034$ $a = -1.00000$ $b = -1.00000$	-2.63189	-14.0000
$u = -1.61803$ $a = -1.00000$ $b = -1.00000$	-10.5276	-14.0000

III. $I_3^u = \langle b-1,\ a^2-2a-2u+5,\ u^2-u-1\rangle$

(i) Arc colorings

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

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

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

$$a_{12} = \begin{pmatrix} -u \\ -u-1 \end{pmatrix}$$

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

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

$$a_2 = \begin{pmatrix} a+1 \\ 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -a \\ -1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} au-4u+2 \\ au-2u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} au+2a-u-1 \\ au+a-u \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -16$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = 1.00000 + 2.28825I$ $b = 1.00000$	2.30291	−16.0000
$u = -0.618034$ $a = 1.00000 - 2.28825I$ $b = 1.00000$	2.30291	−16.0000
$u = 1.61803$ $a = 1.000000 + 0.874032I$ $b = 1.00000$	−5.59278	−16.0000
$u = 1.61803$ $a = 1.000000 - 0.874032I$ $b = 1.00000$	−5.59278	−16.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^6)(u^{57}+27u^{56}+\cdots+3644u+121)$
c_2	$((u-1)^2)(u+1)^4(u^{57}+3u^{56}+\cdots+50u+11)$
c_3, c_4, c_8 c_9	$u^2(u^2+2)^2(u^{57}+u^{56}+\cdots+16u+4)$
c_5	$((u-1)^4)(u+1)^2(u^{57}+3u^{56}+\cdots+50u+11)$
c_6, c_7	$((u^2-u-1)^2)(u^2+u-1)(u^{57}-2u^{56}+\cdots+3u+3)$
c_{10}	$((u^2+u-1)^3)(u^{57}-14u^{56}+\cdots-681u+369)$
c_{11}, c_{12}	$(u^2-u-1)(u^2+u-1)^2(u^{57}-2u^{56}+\cdots+3u+3)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^6)(y^{57}+13y^{56}+\cdots+4124360y-14641)$
c_2, c_5	$((y-1)^6)(y^{57}-27y^{56}+\cdots+3644y-121)$
c_3, c_4, c_8 c_9	$y^2(y+2)^4(y^{57}+67y^{56}+\cdots-64y-16)$
c_6, c_7, c_{11} c_{12}	$((y^2-3y+1)^3)(y^{57}-66y^{56}+\cdots+183y-9)$
c_{10}	$((y^2-3y+1)^3)(y^{57}+6y^{56}+\cdots+3023883y-136161)$