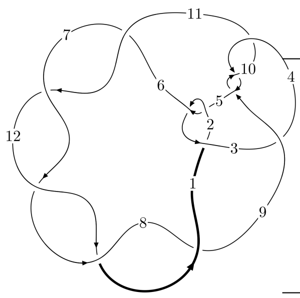
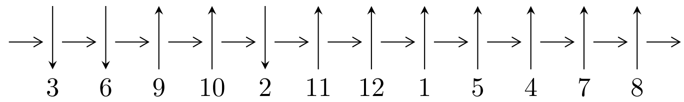
$12a_{0371}$ ($K12a_{0371}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 6.22403 \times 10^{15} u^{53} - 2.16644 \times 10^{16} u^{52} + \cdots + 1.15315 \times 10^{16} b + 1.86130 \times 10^{15},$$
$$- 3.84141 \times 10^{15} u^{53} - 5.38285 \times 10^{15} u^{52} + \cdots + 3.45944 \times 10^{16} a + 4.72334 \times 10^{16},\ u^{54} - 2u^{53} + \cdots - 9u -$$
$$I_2^u = \langle b + 1,\ a - 1,\ u^2 - u - 1 \rangle$$
$$I_3^u = \langle -au + b - u - 1,\ a^2 + 2a + 3,\ u^2 + u - 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 60 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.

$$I^u_1 = \langle 6.22\times10^{15}u^{53} - 2.17\times10^{16}u^{52} + \cdots + 1.15\times10^{16}b + 1.86\times10^{15},\ -3.84\times10^{15}u^{53} - 5.38\times10^{15}u^{52} + \cdots + 3.46\times10^{16}a + 4.72\times10^{16},\ u^{54} - 2u^{53} + \cdots - 9u + 3\rangle$$

(i) Arc colorings

$$a_7 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}0.111041u^{53} + 0.155599u^{52} + \cdots + 4.11220u - 1.36535\\-0.539742u^{53} + 1.87871u^{52} + \cdots + 3.32643u - 0.161411\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^2+1\\u^4-2u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}0.607017u^{53} + 0.0379752u^{52} + \cdots + 3.56687u - 1.29746\\-1.30686u^{53} + 2.07232u^{52} + \cdots - 0.567204u + 1.29954\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-u\\u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u^2+1\\u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}0.874650u^{53} + 0.540026u^{52} + \cdots + 6.16049u - 2.08423\\-1.85817u^{53} + 1.24119u^{52} + \cdots - 7.27374u + 3.92680\end{pmatrix}$$
$$a_5 = \begin{pmatrix}0.818828u^{53} - 1.31508u^{52} + \cdots - 12.3614u + 1.51037\\-1.22880u^{53} + 1.80213u^{52} + \cdots + 3.71901u - 0.853328\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-0.287418u^{53} - 0.715155u^{52} + \cdots - 7.57410u + 3.47537\\0.496261u^{53} + 1.55979u^{52} + \cdots + 11.6363u - 3.00772\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$$= -\frac{1362927332552725}{5765740254433699}u^{53} - \frac{23381515261364111}{5765740254433699}u^{52} + \cdots - \frac{31538711207566149 2}{5765740254433699}u + \frac{81812943695667795}{5765740254433699}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{54} + 25u^{53} + \cdots + 4038u + 121$
c_2, c_5	$u^{54} + 3u^{53} + \cdots - 12u + 11$
c_3	$u^{54} - u^{53} + \cdots - 1064u + 212$
c_4, c_9, c_{10}	$u^{54} + u^{53} + \cdots - 36u^2 + 4$
c_6, c_7, c_8 c_{11}, c_{12}	$u^{54} + 2u^{53} + \cdots + 9u + 3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{54} + 15y^{53} + \cdots - 5943246y + 14641$
c_2, c_5	$y^{54} - 25y^{53} + \cdots - 4038y + 121$
c_3	$y^{54} - 11y^{53} + \cdots - 679264y + 44944$
c_4, c_9, c_{10}	$y^{54} + 49y^{53} + \cdots - 288y + 16$
c_6, c_7, c_8 c_{11}, c_{12}	$y^{54} - 72y^{53} + \cdots + 15y + 9$

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_1	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.033200+0.205031I$ $a=-0.154928-0.608627I$ $b=\ \ 0.043531-1.156360I$	$2.48098-2.65644I$	0
$u=-1.033200-0.205031I$ $a=-0.154928+0.608627I$ $b=\ \ 0.043531+1.156360I$	$2.48098+2.65644I$	0
$u=-0.909027+0.201496I$ $a=\ \ 1.133080-0.239512I$ $b=-1.44506+0.44518I$	$-4.31420-2.29321I$	$6.00000+3.97838I$
$u=-0.909027-0.201496I$ $a=\ \ 1.133080+0.239512I$ $b=-1.44506-0.44518I$	$-4.31420+2.29321I$	$6.00000-3.97838I$
$u=-1.002340+0.391017I$ $a=\ \ 0.373522-0.490684I$ $b=\ \ 0.159427-1.337780I$	$-0.92608-10.90870I$	0
$u=-1.002340-0.391017I$ $a=\ \ 0.373522+0.490684I$ $b=\ \ 0.159427+1.337780I$	$-0.92608+10.90870I$	0
$u=-1.035390+0.306908I$ $a=-0.826876+0.402579I$ $b=\ \ 0.073409+0.249362I$	$1.28679-5.35006I$	0
$u=-1.035390-0.306908I$ $a=-0.826876-0.402579I$ $b=\ \ 0.073409-0.249362I$	$1.28679+5.35006I$	0
$u=\ \ 1.035020+0.327197I$ $a=-0.175793-0.504243I$ $b=-0.136856-1.285110I$	$4.34470+6.91339I$	0
$u=\ \ 1.035020-0.327197I$ $a=-0.175793+0.504243I$ $b=-0.136856+1.285110I$	$4.34470-6.91339I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.084440 + 0.195251I$ $a = 0.775059 + 0.381941I$ $b = -0.098656 + 0.410716I$	$5.85353 + 1.52576I$	0
$u = 1.084440 - 0.195251I$ $a = 0.775059 - 0.381941I$ $b = -0.098656 - 0.410716I$	$5.85353 - 1.52576I$	0
$u = -1.120580 + 0.004894I$ $a = -0.589724 + 0.389273I$ $b = 0.128535 + 0.742200I$	$3.05827 + 2.30358I$	0
$u = -1.120580 - 0.004894I$ $a = -0.589724 - 0.389273I$ $b = 0.128535 - 0.742200I$	$3.05827 - 2.30358I$	0
$u = 0.849728 + 0.155769I$ $a = 0.39360 - 1.41513I$ $b = 0.39372 - 1.40393I$	$-4.89459 + 1.45597I$	$7.23813 - 5.57336I$
$u = 0.849728 - 0.155769I$ $a = 0.39360 + 1.41513I$ $b = 0.39372 + 1.40393I$	$-4.89459 - 1.45597I$	$7.23813 + 5.57336I$
$u = 0.824308$ $a = -1.10776$ $b = 1.34525$	-0.0557748	15.4170
$u = 0.611997 + 0.492090I$ $a = -0.641324 - 0.317061I$ $b = 0.772587 + 0.690967I$	$-3.28887 - 3.64964I$	$5.12459 + 1.94620I$
$u = 0.611997 - 0.492090I$ $a = -0.641324 + 0.317061I$ $b = 0.772587 - 0.690967I$	$-3.28887 + 3.64964I$	$5.12459 - 1.94620I$
$u = 0.184324 + 0.638362I$ $a = 1.16880 + 1.08855I$ $b = 0.356445 - 0.466281I$	$-4.58312 + 7.42689I$	$2.31046 - 6.99724I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.184324 - 0.638362I$ $a = 1.16880 - 1.08855I$ $b = 0.356445 + 0.466281I$	$-4.58312 - 7.42689I$	$2.31046 + 6.99724I$
$u = 0.454241 + 0.453212I$ $a = 0.661574 + 0.833835I$ $b = 0.301434 - 0.167958I$	$-2.14560 + 0.88769I$	$6.18591 - 4.35554I$
$u = 0.454241 - 0.453212I$ $a = 0.661574 - 0.833835I$ $b = 0.301434 + 0.167958I$	$-2.14560 - 0.88769I$	$6.18591 + 4.35554I$
$u = -0.455135 + 0.442932I$ $a = 0.490955 - 0.173110I$ $b = -0.587686 + 0.546971I$	$1.046370 + 0.494844I$	$10.64023 + 0.18722I$
$u = -0.455135 - 0.442932I$ $a = 0.490955 + 0.173110I$ $b = -0.587686 - 0.546971I$	$1.046370 - 0.494844I$	$10.64023 - 0.18722I$
$u = -0.248292 + 0.564754I$ $a = -0.98947 + 1.14172I$ $b = -0.374122 - 0.374831I$	$0.36246 - 3.88016I$	$7.34275 + 7.06872I$
$u = -0.248292 - 0.564754I$ $a = -0.98947 - 1.14172I$ $b = -0.374122 + 0.374831I$	$0.36246 + 3.88016I$	$7.34275 - 7.06872I$
$u = 0.260818 + 0.544636I$ $a = -0.240106 - 0.253128I$ $b = 0.306471 + 0.627052I$	$-2.73742 + 2.46050I$	$4.87493 - 3.38491I$
$u = 0.260818 - 0.544636I$ $a = -0.240106 + 0.253128I$ $b = 0.306471 - 0.627052I$	$-2.73742 - 2.46050I$	$4.87493 + 3.38491I$
$u = -1.54880 + 0.05145I$ $a = -0.928695 - 0.013670I$ $b = 0.951552 + 0.345464I$	$3.71593 + 1.81884I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.54880 - 0.05145I$ $a = -0.928695 + 0.013670I$ $b = 0.951552 - 0.345464I$	$3.71593 - 1.81884I$	0
$u = -0.421997$ $a = -0.252936$ $b = -0.323293$	0.611710	16.5140
$u = 1.59012$ $a = 1.01605$ $b = -1.17062$	7.70118	0
$u = 0.209460 + 0.318057I$ $a = 0.26966 + 1.81111I$ $b = 0.598382 - 0.217505I$	$-1.44891 + 0.87205I$	$-0.45042 - 2.57700I$
$u = 0.209460 - 0.318057I$ $a = 0.26966 - 1.81111I$ $b = 0.598382 + 0.217505I$	$-1.44891 - 0.87205I$	$-0.45042 + 2.57700I$
$u = 0.052280 + 0.369852I$ $a = -2.16277 + 2.09624I$ $b = -0.774037 - 0.521212I$	$-7.25657 + 0.32248I$	$-3.59043 - 0.24507I$
$u = 0.052280 - 0.369852I$ $a = -2.16277 - 2.09624I$ $b = -0.774037 + 0.521212I$	$-7.25657 - 0.32248I$	$-3.59043 + 0.24507I$
$u = -1.68847 + 0.03150I$ $a = -0.90904 - 3.14347I$ $b = 1.74981 + 5.17567I$	$4.15513 - 2.12237I$	0
$u = -1.68847 - 0.03150I$ $a = -0.90904 + 3.14347I$ $b = 1.74981 - 5.17567I$	$4.15513 + 2.12237I$	0
$u = -1.69091$ $a = -1.02001$ $b = 0.854840$	8.98922	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.69828 + 0.04672I$ $a = 1.022170 + 0.018668I$ $b = -0.834861 + 0.045952I$	$4.95768 + 3.23508I$	0
$u = 1.69828 - 0.04672I$ $a = 1.022170 - 0.018668I$ $b = -0.834861 - 0.045952I$	$4.95768 - 3.23508I$	0
$u = 1.71944 + 0.10562I$ $a = -0.42831 - 2.69040I$ $b = 0.36112 + 4.43030I$	$8.6699 + 12.9219I$	0
$u = 1.71944 - 0.10562I$ $a = -0.42831 + 2.69040I$ $b = 0.36112 - 4.43030I$	$8.6699 - 12.9219I$	0
$u = 1.72963 + 0.05599I$ $a = 0.14187 - 2.61907I$ $b = -0.54631 + 4.33951I$	$12.36250 + 3.74731I$	0
$u = 1.72963 - 0.05599I$ $a = 0.14187 + 2.61907I$ $b = -0.54631 - 4.33951I$	$12.36250 - 3.74731I$	0
$u = 1.72946 + 0.07949I$ $a = 0.62410 + 1.44096I$ $b = -1.29088 - 2.56923I$	$11.12150 + 6.92662I$	0
$u = 1.72946 - 0.07949I$ $a = 0.62410 - 1.44096I$ $b = -1.29088 + 2.56923I$	$11.12150 - 6.92662I$	0
$u = -1.72986 + 0.08588I$ $a = 0.19966 - 2.64199I$ $b = 0.00573 + 4.36280I$	$14.1686 - 8.6037I$	0
$u = -1.72986 - 0.08588I$ $a = 0.19966 + 2.64199I$ $b = 0.00573 - 4.36280I$	$14.1686 + 8.6037I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.73989 + 0.05063I$ $a = -0.61741 + 1.65827I$ $b = 1.29019 - 2.88401I$	$15.9719 - 2.5529I$	0
$u = -1.73989 - 0.05063I$ $a = -0.61741 - 1.65827I$ $b = 1.29019 + 2.88401I$	$15.9719 + 2.5529I$	0
$u = 1.74111 + 0.01390I$ $a = 0.59275 + 1.97467I$ $b = -1.25696 - 3.35550I$	$13.30770 - 2.12200I$	0
$u = 1.74111 - 0.01390I$ $a = 0.59275 - 1.97467I$ $b = -1.25696 + 3.35550I$	$13.30770 + 2.12200I$	0

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^2$
c_3, c_4, c_9 c_{10}	u^2
c_5	$(u+1)^2$
c_6, c_7, c_8	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_9 c_{10}	y^2
c_6, c_7, c_8 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
$u = -0.618034$ $a = 1.00000$ $b = -1.00000$	-0.657974	2.00000
$u = 1.61803$ $a = 1.00000$ $b = -1.00000$	7.23771	2.00000

III. $\boldsymbol{I_3^u = \langle -au + b - u - 1,\ a^2 + 2a + 3,\ u^2 + u - 1 \rangle}$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} a \\ au + u + 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u \\ -u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} au + a + u \\ 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a + u \\ au + 2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -a \\ -au - u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a + u + 3 \\ -a + u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4$

(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_9 c_{10}	$(u^2+2)^2$
c_6, c_7, c_8	$(u^2+u-1)^2$
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_9 c_{10}	$(y+2)^4$
c_6, c_7, c_8 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
$u = \quad 0.618034$ $a = -1.00000 + 1.41421I$ $b = \quad 1.000000 + 0.874032I$	-5.59278	4.00000
$u = \quad 0.618034$ $a = -1.00000 - 1.41421I$ $b = \quad 1.000000 - 0.874032I$	-5.59278	4.00000
$u = -1.61803$ $a = -1.00000 + 1.41421I$ $b = \quad 1.00000 - 2.28825I$	2.30291	4.00000
$u = -1.61803$ $a = -1.00000 - 1.41421I$ $b = \quad 1.00000 + 2.28825I$	2.30291	4.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^6)(u^{54}+25u^{53}+\cdots+4038u+121)$
c_2	$((u-1)^2)(u+1)^4(u^{54}+3u^{53}+\cdots-12u+11)$
c_3	$u^2(u^2+2)^2(u^{54}-u^{53}+\cdots-1064u+212)$
c_4, c_9, c_{10}	$u^2(u^2+2)^2(u^{54}+u^{53}+\cdots-36u^2+4)$
c_5	$((u-1)^4)(u+1)^2(u^{54}+3u^{53}+\cdots-12u+11)$
c_6, c_7, c_8	$(u^2-u-1)(u^2+u-1)^2(u^{54}+2u^{53}+\cdots+9u+3)$
c_{11}, c_{12}	$((u^2-u-1)^2)(u^2+u-1)(u^{54}+2u^{53}+\cdots+9u+3)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^6)(y^{54}+15y^{53}+\cdots-5943246y+14641)$
c_2, c_5	$((y-1)^6)(y^{54}-25y^{53}+\cdots-4038y+121)$
c_3	$y^2(y+2)^4(y^{54}-11y^{53}+\cdots-679264y+44944)$
c_4, c_9, c_{10}	$y^2(y+2)^4(y^{54}+49y^{53}+\cdots-288y+16)$
c_6, c_7, c_8 c_{11}, c_{12}	$((y^2-3y+1)^3)(y^{54}-72y^{53}+\cdots+15y+9)$