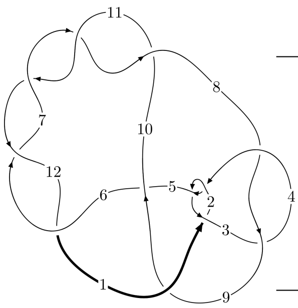
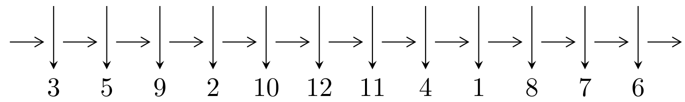
$12a_{0152}$ $(K12a_{0152})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 2u^{59} + 3u^{58} + \cdots + b - 1,\ u^{60} + 39u^{58} + \cdots + a + 1,\ u^{61} + 2u^{60} + \cdots - u - 1\rangle$$
$$I_2^u = \langle -u^3 + u^2 + b - 2u + 1,\ u^4 + 3u^2 + a + 1,\ u^5 - u^4 + 4u^3 - 3u^2 + 3u - 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 66 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.

$$I_1^u = \langle 2u^{59}+3u^{58}+\cdots+b-1,\ u^{60}+39u^{58}+\cdots+a+1,\ u^{61}+2u^{60}+\cdots-u-1\rangle$$

(i) Arc colorings

$$a_7 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^{60}-39u^{58}+\cdots-u^2-1\\-2u^{59}-3u^{58}+\cdots+2u+1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u^9+6u^7+11u^5+6u^3+u\\-u^9-5u^7-7u^5-2u^3+u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^{60}-2u^{59}+\cdots-3u^3-u^2\\-u^{58}-2u^{57}+\cdots+u+1\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^2+1\\-u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^3-2u\\u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^6-3u^4+1\\-u^8-4u^6-4u^4-2u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-u^{60}-u^{59}+\cdots+2u^3-2u^2\\-u^{59}-2u^{58}+\cdots+2u+1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= u^{60}+2u^{59}+\cdots-13u-14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{61} + 28u^{60} + \cdots + 25u + 1$
c_2, c_4	$u^{61} - 6u^{60} + \cdots + u + 1$
c_3, c_8	$u^{61} - u^{60} + \cdots + 32u + 32$
c_5	$u^{61} - 2u^{60} + \cdots + 3487u + 389$
c_6, c_7, c_{10} c_{11}, c_{12}	$u^{61} - 2u^{60} + \cdots - u + 1$
c_9	$u^{61} + 8u^{60} + \cdots + 6443u + 1751$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{61} + 16y^{60} + \cdots + 1049y - 1$
c_2, c_4	$y^{61} - 28y^{60} + \cdots + 25y - 1$
c_3, c_8	$y^{61} + 33y^{60} + \cdots - 9728y - 1024$
c_5	$y^{61} + 16y^{60} + \cdots + 1506015y - 151321$
c_6, c_7, c_{10} c_{11}, c_{12}	$y^{61} + 80y^{60} + \cdots + 7y - 1$
c_9	$y^{61} + 28y^{60} + \cdots - 9774541y - 3066001$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.254354 + 0.981103I$ $a = -1.25198 - 2.54671I$ $b = 0.07492 + 2.00861I$	$1.22942 + 3.29969I$	0
$u = -0.254354 - 0.981103I$ $a = -1.25198 + 2.54671I$ $b = 0.07492 - 2.00861I$	$1.22942 - 3.29969I$	0
$u = 0.211321 + 1.001770I$ $a = -0.322034 - 0.875785I$ $b = -0.289419 + 0.657547I$	$3.12919 - 1.33617I$	0
$u = 0.211321 - 1.001770I$ $a = -0.322034 + 0.875785I$ $b = -0.289419 - 0.657547I$	$3.12919 + 1.33617I$	0
$u = 0.281128 + 0.997371I$ $a = 0.582713 + 0.789402I$ $b = 0.070322 - 0.761861I$	$2.34136 - 5.73880I$	0
$u = 0.281128 - 0.997371I$ $a = 0.582713 - 0.789402I$ $b = 0.070322 + 0.761861I$	$2.34136 + 5.73880I$	0
$u = -0.328410 + 1.012920I$ $a = -1.51065 - 2.03863I$ $b = 0.68097 + 1.62757I$	$5.15125 + 11.89640I$	0
$u = -0.328410 - 1.012920I$ $a = -1.51065 + 2.03863I$ $b = 0.68097 - 1.62757I$	$5.15125 - 11.89640I$	0
$u = -0.302074 + 1.025430I$ $a = 1.38727 + 2.07338I$ $b = -0.49004 - 1.57864I$	$7.28412 + 6.15559I$	0
$u = -0.302074 - 1.025430I$ $a = 1.38727 - 2.07338I$ $b = -0.49004 + 1.57864I$	$7.28412 - 6.15559I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.316983 + 0.866277I$ $a = 0.824553 + 0.132321I$ $b = -0.397869 - 0.455885I$	$1.00389 - 1.16184I$	0
$u = 0.316983 - 0.866277I$ $a = 0.824553 - 0.132321I$ $b = -0.397869 + 0.455885I$	$1.00389 + 1.16184I$	0
$u = -0.207432 + 1.073920I$ $a = 0.85102 + 1.88063I$ $b = 0.092713 - 1.158660I$	$8.38349 + 1.96602I$	0
$u = -0.207432 - 1.073920I$ $a = 0.85102 - 1.88063I$ $b = 0.092713 + 1.158660I$	$8.38349 - 1.96602I$	0
$u = -0.156803 + 1.097010I$ $a = -0.65117 - 1.69342I$ $b = -0.278390 + 0.945645I$	$7.08755 - 3.73090I$	0
$u = -0.156803 - 1.097010I$ $a = -0.65117 + 1.69342I$ $b = -0.278390 - 0.945645I$	$7.08755 + 3.73090I$	0
$u = 0.148119 + 0.845043I$ $a = 0.414383 - 0.713810I$ $b = -0.575491 + 0.156747I$	$1.88176 - 1.60682I$	$-5.29446 + 5.04055I$
$u = 0.148119 - 0.845043I$ $a = 0.414383 + 0.713810I$ $b = -0.575491 - 0.156747I$	$1.88176 + 1.60682I$	$-5.29446 - 5.04055I$
$u = 0.325121 + 0.738493I$ $a = -1.089280 + 0.346297I$ $b = 0.705617 + 0.283188I$	$0.29625 - 4.76842I$	$-9.08610 + 8.21702I$
$u = 0.325121 - 0.738493I$ $a = -1.089280 - 0.346297I$ $b = 0.705617 - 0.283188I$	$0.29625 + 4.76842I$	$-9.08610 - 8.21702I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.092397 + 0.693687I$ $a = -1.029970 + 0.913793I$ $b = 1.174630 + 0.233112I$	$-0.987120 + 0.988516I$	$-11.84015 - 0.12287I$
$u = -0.092397 - 0.693687I$ $a = -1.029970 - 0.913793I$ $b = 1.174630 - 0.233112I$	$-0.987120 - 0.988516I$	$-11.84015 + 0.12287I$
$u = -0.429667 + 0.466787I$ $a = 0.300862 - 0.006110I$ $b = 0.537163 + 1.081280I$	$2.11665 - 5.58640I$	$-9.13002 + 1.98520I$
$u = -0.429667 - 0.466787I$ $a = 0.300862 + 0.006110I$ $b = 0.537163 - 1.081280I$	$2.11665 + 5.58640I$	$-9.13002 - 1.98520I$
$u = -0.556702 + 0.224542I$ $a = 2.03671 + 0.31639I$ $b = -0.005895 + 0.791176I$	$1.32668 + 8.88717I$	$-11.5386 - 8.5026I$
$u = -0.556702 - 0.224542I$ $a = 2.03671 - 0.31639I$ $b = -0.005895 - 0.791176I$	$1.32668 - 8.88717I$	$-11.5386 + 8.5026I$
$u = -0.437350 + 0.391378I$ $a = -0.666219 - 0.260171I$ $b = -0.393377 - 0.987812I$	$3.80352 - 0.17614I$	$-6.56300 - 3.19514I$
$u = -0.437350 - 0.391378I$ $a = -0.666219 + 0.260171I$ $b = -0.393377 + 0.987812I$	$3.80352 + 0.17614I$	$-6.56300 + 3.19514I$
$u = -0.523029 + 0.253421I$ $a = -1.74252 - 0.41441I$ $b = -0.088899 - 0.841462I$	$3.32476 + 3.34552I$	$-8.30796 - 4.53572I$
$u = -0.523029 - 0.253421I$ $a = -1.74252 + 0.41441I$ $b = -0.088899 + 0.841462I$	$3.32476 - 3.34552I$	$-8.30796 + 4.53572I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.544484 + 0.051126I$ $a = 0.271290 - 1.260450I$ $b = -0.152520 + 0.534984I$	$-1.77296 + 1.77637I$	$-13.44810 - 3.42636I$
$u = 0.544484 - 0.051126I$ $a = 0.271290 + 1.260450I$ $b = -0.152520 - 0.534984I$	$-1.77296 - 1.77637I$	$-13.44810 + 3.42636I$
$u = 0.479319 + 0.211089I$ $a = 0.97175 - 1.13377I$ $b = -0.539313 + 0.342045I$	$-1.38873 - 3.13575I$	$-13.6527 + 6.6645I$
$u = 0.479319 - 0.211089I$ $a = 0.97175 + 1.13377I$ $b = -0.539313 - 0.342045I$	$-1.38873 + 3.13575I$	$-13.6527 - 6.6645I$
$u = -0.425241 + 0.171006I$ $a = 1.80164 + 1.52641I$ $b = 0.240942 + 0.694488I$	$-2.33602 + 0.95454I$	$-12.3987 - 7.0289I$
$u = -0.425241 - 0.171006I$ $a = 1.80164 - 1.52641I$ $b = 0.240942 - 0.694488I$	$-2.33602 - 0.95454I$	$-12.3987 + 7.0289I$
$u = 0.307712 + 0.317136I$ $a = -1.21859 + 0.96164I$ $b = 0.621069 - 0.032600I$	$-0.798120 + 0.509659I$	$-11.36907 + 1.74616I$
$u = 0.307712 - 0.317136I$ $a = -1.21859 - 0.96164I$ $b = 0.621069 + 0.032600I$	$-0.798120 - 0.509659I$	$-11.36907 - 1.74616I$
$u = 0.04390 + 1.64371I$ $a = 0.471528 - 0.589481I$ $b = -1.69900 + 0.69117I$	$8.54157 - 5.92897I$	0
$u = 0.04390 - 1.64371I$ $a = 0.471528 + 0.589481I$ $b = -1.69900 - 0.69117I$	$8.54157 + 5.92897I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.00808+1.66823I$ $a=\ \ 0.636613-0.961433I$ $b=-2.50286+1.98917I$	$7.54962+1.22321I$	0
$u=-0.00808-1.66823I$ $a=\ \ 0.636613+0.961433I$ $b=-2.50286-1.98917I$	$7.54962-1.22321I$	0
$u=\ \ 0.07133+1.68137I$ $a=-0.481555+0.218553I$ $b=\ \ 1.133360+0.000284I$	$9.95685-2.59158I$	0
$u=\ \ 0.07133-1.68137I$ $a=-0.481555-0.218553I$ $b=\ \ 1.133360-0.000284I$	$9.95685+2.59158I$	0
$u=\ \ 0.02693+1.68333I$ $a=-0.182151+0.761285I$ $b=\ \ 1.04861-1.56495I$	$10.86580-2.21377I$	0
$u=\ \ 0.02693-1.68333I$ $a=-0.182151-0.761285I$ $b=\ \ 1.04861+1.56495I$	$10.86580+2.21377I$	0
$u=\ \ 0.316056$ $a=-1.09435$ $b=\ \ 0.309110$	-0.608532	-16.3260
$u=-0.06576+1.71571I$ $a=\ \ 0.82473+2.57511I$ $b=-2.07010-6.76803I$	$10.82330+4.58248I$	0
$u=-0.06576-1.71571I$ $a=\ \ 0.82473-2.57511I$ $b=-2.07010+6.76803I$	$10.82330-4.58248I$	0
$u=\ \ 0.07278+1.71903I$ $a=-0.769346-0.337131I$ $b=\ \ 1.25059+1.17834I$	$11.99390-7.16364I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.07278 - 1.71903I$ $a = -0.769346 + 0.337131I$ $b = 1.25059 - 1.17834I$	$11.99390 + 7.16364I$	0
$u = 0.05627 + 1.72019I$ $a = 0.607773 + 0.556302I$ $b = -0.85094 - 1.51707I$	$12.83490 - 2.42911I$	0
$u = 0.05627 - 1.72019I$ $a = 0.607773 - 0.556302I$ $b = -0.85094 + 1.51707I$	$12.83490 + 2.42911I$	0
$u = -0.08659 + 1.72253I$ $a = 0.88576 + 2.17643I$ $b = -2.64835 - 5.43557I$	$14.8480 + 13.5808I$	0
$u = -0.08659 - 1.72253I$ $a = 0.88576 - 2.17643I$ $b = -2.64835 + 5.43557I$	$14.8480 - 13.5808I$	0
$u = -0.07895 + 1.72628I$ $a = -0.83698 - 2.26090I$ $b = 2.34895 + 5.64277I$	$17.0651 + 7.7083I$	0
$u = -0.07895 - 1.72628I$ $a = -0.83698 + 2.26090I$ $b = 2.34895 - 5.64277I$	$17.0651 - 7.7083I$	0
$u = -0.05183 + 1.73689I$ $a = -0.57601 - 2.21329I$ $b = 1.15538 + 5.39428I$	$18.4431 + 3.0304I$	0
$u = -0.05183 - 1.73689I$ $a = -0.57601 + 2.21329I$ $b = 1.15538 - 5.39428I$	$18.4431 - 3.0304I$	0
$u = -0.03876 + 1.73935I$ $a = 0.50704 + 2.06226I$ $b = -0.80734 - 4.96112I$	$17.2479 - 2.9269I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.03876 - 1.73935I$		
$a = \quad 0.50704 - 2.06226I$	$17.2479 + 2.9269I$	0
$b = -0.80734 + 4.96112I$		

II.

$$\boldsymbol{I_2^u = \langle -u^3 + u^2 + b - 2u + 1,\ u^4 + 3u^2 + a + 1,\ u^5 - u^4 + 4u^3 - 3u^2 + 3u - 1\rangle}$$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} -u^4 - 3u^2 - 1 \\ u^3 - u^2 + 2u - 1 \end{pmatrix}$$

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

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

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

$$a_3 = \begin{pmatrix} -u^4 - 3u^2 - 1 \\ u^3 - u^2 + 2u - 1 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} u^3 + 2u \\ -u^3 - u \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3u^4 + 3u^3 - 12u^2 + 10u - 19$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^5$
c_3, c_8	y^5
c_5, c_9	$y^5 - y^4 + 4y^3 - 3y^2 + 3y - 1$
c_6, c_7, c_{10} c_{11}, c_{12}	$y^5 + 7y^4 + 16y^3 + 13y^2 + 3y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.233677 + 0.885557I$ $a = 0.827780 - 0.637683I$ $b = -0.340036 + 0.807849I$	$0.17487 - 2.21397I$	$-10.60206 + 4.05273I$
$u = 0.233677 - 0.885557I$ $a = 0.827780 + 0.637683I$ $b = -0.340036 - 0.807849I$	$0.17487 + 2.21397I$	$-10.60206 - 4.05273I$
$u = 0.416284$ $a = -1.54991$ $b = -0.268586$	-2.52712	-16.7900
$u = 0.05818 + 1.69128I$ $a = -0.552827 + 0.534136I$ $b = 1.47433 - 1.63485I$	$9.31336 - 3.33174I$	$-10.00277 + 3.46299I$
$u = 0.05818 - 1.69128I$ $a = -0.552827 - 0.534136I$ $b = 1.47433 + 1.63485I$	$9.31336 + 3.33174I$	$-10.00277 - 3.46299I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^5)(u^{61}+28u^{60}+\cdots+25u+1)$
c_2	$((u-1)^5)(u^{61}-6u^{60}+\cdots+u+1)$
c_3, c_8	$u^5(u^{61}-u^{60}+\cdots+32u+32)$
c_4	$((u+1)^5)(u^{61}-6u^{60}+\cdots+u+1)$
c_5	$(u^5-u^4+u^2+u-1)(u^{61}-2u^{60}+\cdots+3487u+389)$
c_6, c_7	$(u^5-u^4+4u^3-3u^2+3u-1)(u^{61}-2u^{60}+\cdots-u+1)$
c_9	$(u^5-u^4+u^2+u-1)(u^{61}+8u^{60}+\cdots+6443u+1751)$
c_{10}, c_{11}, c_{12}	$(u^5+u^4+4u^3+3u^2+3u+1)(u^{61}-2u^{60}+\cdots-u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^5)(y^{61}+16y^{60}+\cdots+1049y-1)$
c_2, c_4	$((y-1)^5)(y^{61}-28y^{60}+\cdots+25y-1)$
c_3, c_8	$y^5(y^{61}+33y^{60}+\cdots-9728y-1024)$
c_5	$(y^5-y^4+4y^3-3y^2+3y-1)$ $\cdot\,(y^{61}+16y^{60}+\cdots+1506015y-151321)$
c_6, c_7, c_{10} c_{11}, c_{12}	$(y^5+7y^4+16y^3+13y^2+3y-1)(y^{61}+80y^{60}+\cdots+7y-1)$
c_9	$(y^5-y^4+4y^3-3y^2+3y-1)$ $\cdot\,(y^{61}+28y^{60}+\cdots-9774541y-3066001)$