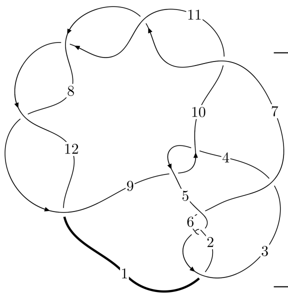
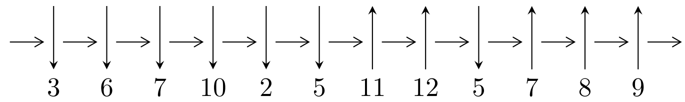
$12n_{0309}$ ($K12n_{0309}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^4 + 5u^2 + 4b + 6u + 1,\ 2u^5 + 5u^4 - 6u^3 - 29u^2 + 4a - 24u - 9,\ u^6 + 3u^5 - 2u^4 - 17u^3 - 18u^2 - 5u + 1\rangle$$

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

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 12 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. $\boldsymbol{I_1^u = \langle -u^4 + 5u^2 + 4b + 6u + 1,\ 2u^5 + 5u^4 - 6u^3 - 29u^2 + 4a - 24u - 9,\ u^6 + 3u^5 - 2u^4 - 17u^3 - 18u^2 - 5u + 1\rangle}$

(i) Arc colorings

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

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

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

$$a_5 = \begin{pmatrix} -\frac{1}{2}u^5 - \frac{5}{4}u^4 + \cdots + 6u + \frac{9}{4} \\ \frac{1}{4}u^4 - \frac{5}{4}u^2 - \frac{3}{2}u - \frac{1}{4} \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -\frac{1}{4}u^5 - \frac{1}{2}u^4 + \cdots + \frac{13}{4}u + 2 \\ \frac{1}{4}u^5 + \frac{1}{2}u^4 - \frac{7}{4}u^3 - 3u^2 - \frac{5}{4}u \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -\frac{3}{2}u^5 - \frac{11}{4}u^4 + \cdots + 9u + \frac{7}{4} \\ u^5 + \frac{7}{4}u^4 + \cdots - \frac{9}{2}u + \frac{1}{4} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{2}u^5 - u^4 + \frac{3}{2}u^3 + 6u^2 + \frac{9}{2}u + 2 \\ u^5 + \frac{7}{4}u^4 + \cdots - \frac{9}{2}u + \frac{1}{4} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ \frac{1}{4}u^5 + \frac{1}{2}u^4 - \frac{3}{4}u^3 - 4u^2 - \frac{9}{4}u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^3 - 2u \\ -u^5 + 3u^3 - u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^5 + 6u^4 - 4u^3 - \frac{69}{2}u^2 - \frac{71}{2}u - \frac{13}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^6 + 6u^5 + 17u^4 + 22u^3 - 6u^2 - 4u + 1$
c_2, c_5	$u^6 + 2u^5 - u^4 - 6u^3 - 4u^2 - 2u - 1$
c_3	$u^6 - 32u^5 + 357u^4 - 1330u^3 - 670u^2 - 786u - 433$
c_4, c_9	$u^6 + 4u^5 - 40u^4 - 160u^3 + 192u^2 - 96u - 64$
c_7, c_8, c_{10} c_{11}, c_{12}	$u^6 - 3u^5 - 2u^4 + 17u^3 - 18u^2 + 5u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^6 - 2y^5 + 13y^4 - 638y^3 + 246y^2 - 28y + 1$
c_2, c_5	$y^6 - 6y^5 + 17y^4 - 22y^3 - 6y^2 + 4y + 1$
c_3	$y^6 - 310y^5 + \cdots - 37576y + 187489$
c_4, c_9	$y^6 - 96y^5 + 3264y^4 - 40320y^3 + 11264y^2 - 33792y + 4096$
c_7, c_8, c_{10} c_{11}, c_{12}	$y^6 - 13y^5 + 70y^4 - 185y^3 + 150y^2 - 61y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.769155 + 0.318981I$ $a = 0.780154 - 0.426955I$ $b = 0.291213 + 0.014710I$	$1.40855 - 0.49854I$	$5.08917 + 1.32495I$
$u = -0.769155 - 0.318981I$ $a = 0.780154 + 0.426955I$ $b = 0.291213 - 0.014710I$	$1.40855 + 0.49854I$	$5.08917 - 1.32495I$
$u = 0.130756$ $a = 3.16146$ $b = -0.467433$	-0.927213	-11.7390
$u = -1.98103 + 0.85464I$ $a = -0.545050 + 0.888077I$ $b = -1.58699 - 2.45706I$	$-4.00977 - 6.34376I$	$1.76361 + 2.48758I$
$u = -1.98103 - 0.85464I$ $a = -0.545050 - 0.888077I$ $b = -1.58699 + 2.45706I$	$-4.00977 + 6.34376I$	$1.76361 - 2.48758I$
$u = 2.36961$ $a = 0.368332$ $b = -2.94101$	6.12964	1.03330

II. $I_2^u = \langle b + a,\ a^3 - a^2 + 2a - 1,\ u^2 - u - 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= a^2u - au + 3a + 3u + 1$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.618034$ $a=\ \ 0.215080+1.307140I$ $b=-0.215080-1.307140I$	$4.01109-2.82812I$	$0.95146+4.38177I$
$u=-0.618034$ $a=\ \ 0.215080-1.307140I$ $b=-0.215080+1.307140I$	$4.01109+2.82812I$	$0.95146-4.38177I$
$u=-0.618034$ $a=\ \ 0.569840$ $b=-0.569840$	-0.126494	1.00690
$u=\ \ 1.61803$ $a=\ \ 0.215080+1.307140I$ $b=-0.215080-1.307140I$	$11.90680-2.82812I$	$3.46158+2.71621I$
$u=\ \ 1.61803$ $a=\ \ 0.215080-1.307140I$ $b=-0.215080+1.307140I$	$11.90680+2.82812I$	$3.46158-2.71621I$
$u=\ \ 1.61803$ $a=\ \ 0.569840$ $b=-0.569840$	7.76919	7.16700

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^3-u^2+2u-1)^2(u^6+6u^5+17u^4+22u^3-6u^2-4u+1)$
c_2	$(u^3+u^2-1)^2(u^6+2u^5-u^4-6u^3-4u^2-2u-1)$
c_3	$(u^3-u^2+2u-1)^2$ $\cdot(u^6-32u^5+357u^4-1330u^3-670u^2-786u-433)$
c_4, c_9	$u^6(u^6+4u^5-40u^4-160u^3+192u^2-96u-64)$
c_5	$(u^3-u^2+1)^2(u^6+2u^5-u^4-6u^3-4u^2-2u-1)$
c_6	$(u^3+u^2+2u+1)^2(u^6+6u^5+17u^4+22u^3-6u^2-4u+1)$
c_7, c_8	$(u^2-u-1)^3(u^6-3u^5-2u^4+17u^3-18u^2+5u+1)$
c_{10}, c_{11}, c_{12}	$(u^2+u-1)^3(u^6-3u^5-2u^4+17u^3-18u^2+5u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^3+3y^2+2y-1)^2(y^6-2y^5+13y^4-638y^3+246y^2-28y+1)$
c_2, c_5	$(y^3-y^2+2y-1)^2(y^6-6y^5+17y^4-22y^3-6y^2+4y+1)$
c_3	$((y^3+3y^2+2y-1)^2)(y^6-310y^5+\cdots-37576y+187489)$
c_4, c_9	$y^6(y^6-96y^5+3264y^4-40320y^3+11264y^2-33792y+4096)$
c_7, c_8, c_{10} c_{11}, c_{12}	$(y^2-3y+1)^3(y^6-13y^5+70y^4-185y^3+150y^2-61y+1)$