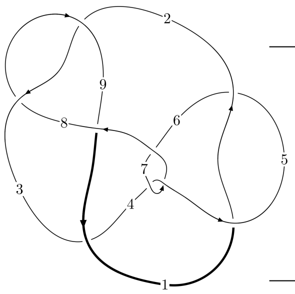
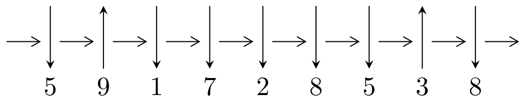
9_{43} $(K9n_3)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^5 + u^4 - 2u^3 + u^2 + b - u + 1,\ u^7 - 2u^6 + 5u^5 - 5u^4 + 6u^3 - 5u^2 + a + 3u - 3,$$
$$u^8 - 2u^7 + 5u^6 - 6u^5 + 7u^4 - 7u^3 + 4u^2 - 4u + 1\rangle$$
$$I_2^u = \langle b + 1,\ a - u - 1,\ u^2 + u + 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 10 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. $\boldsymbol{I_1^u = \langle -u^5 + u^4 - 2u^3 + u^2 + b - u + 1,\ u^7 - 2u^6 + 5u^5 - 5u^4 + 6u^3 - 5u^2 + a + 3u - 3,\ u^8 - 2u^7 + \cdots - 4u + 1\rangle}$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^2 + 1 \\ -u^2 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -u^7 + 2u^6 - 5u^5 + 5u^4 - 6u^3 + 5u^2 - 3u + 3 \\ u^5 - u^4 + 2u^3 - u^2 + u - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^7 + 2u^6 - 4u^5 + 5u^4 - 4u^3 + 5u^2 - 2u + 3 \\ -u^6 + u^5 - 3u^4 + 2u^3 - 2u^2 + 2u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^5 + 2u^3 + u \\ -u^5 - u^3 - u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^7 + u^6 - 3u^5 + 2u^4 - 2u^3 + 3u^2 + 2 \\ -u^6 + u^5 - 3u^4 + 2u^3 - 2u^2 + 2u - 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^7 + u^6 - 3u^5 + 2u^4 - 2u^3 + 3u^2 + 2 \\ -u^6 + u^5 - 3u^4 + 2u^3 - 2u^2 + 2u - 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -u^7 + u^6 - u^5 - 2u^4 + 6u^3 - 5u^2 + 5u - 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^8 + u^7 - 7u^6 - 4u^5 + 16u^4 - 3u^3 - 9u^2 - 8u - 4$
c_2, c_8	$u^8 + 2u^7 + 5u^6 + 6u^5 + 7u^4 + 7u^3 + 4u^2 + 4u + 1$
c_3	$u^8 - 2u^7 - 7u^6 + 12u^5 + 5u^4 + 3u^3 - 2u^2 + 2u + 1$
c_4, c_7	$u^8 - 3u^7 - 2u^6 + 9u^5 + 5u^4 - 13u^3 - 3u^2 + 3u - 1$
c_6	$u^8 + 13u^7 + 68u^6 + 185u^5 + 287u^4 + 249u^3 + 77u^2 + 3u + 1$
c_9	$u^8 + 6u^7 + 15u^6 + 14u^5 - 9u^4 - 31u^3 - 26u^2 - 8u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^8 - 15y^7 + 89y^6 - 252y^5 + 366y^4 - 305y^3 - 95y^2 + 8y + 16$
c_2, c_8	$y^8 + 6y^7 + 15y^6 + 14y^5 - 9y^4 - 31y^3 - 26y^2 - 8y + 1$
c_3	$y^8 - 18y^7 + 107y^6 - 206y^5 - 9y^4 - 91y^3 + 2y^2 - 8y + 1$
c_4, c_7	$y^8 - 13y^7 + 68y^6 - 185y^5 + 287y^4 - 249y^3 + 77y^2 - 3y + 1$
c_6	$y^8 - 33y^7 + \cdots + 145y + 1$
c_9	$y^8 - 6y^7 + 39y^6 - 146y^5 + 267y^4 - 239y^3 + 162y^2 - 116y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.381025+0.877247I$ $a=\ \ 0.332599+0.127423I$ $b=\ \ 0.238510-0.243220I$	$-0.36340-1.66195I$	$-2.61632+3.48117I$
$u=-0.381025-0.877247I$ $a=\ \ 0.332599-0.127423I$ $b=\ \ 0.238510+0.243220I$	$-0.36340+1.66195I$	$-2.61632-3.48117I$
$u=\ \ 1.11498$ $a=-1.63389$ $b=\ \ 1.82176$	-11.0713	-7.35940
$u=\ \ 0.126694+1.193160I$ $a=-0.399095-1.030330I$ $b=-1.178780+0.606721I$	$-4.43209+1.62541I$	$-10.58501-1.42555I$
$u=\ \ 0.126694-1.193160I$ $a=-0.399095+1.030330I$ $b=-1.178780-0.606721I$	$-4.43209-1.62541I$	$-10.58501+1.42555I$
$u=\ \ 0.54402+1.39007I$ $a=-0.321827+1.239280I$ $b=\ \ 1.89776-0.22684I$	$-15.4360+5.9041I$	$-9.72541-2.82977I$
$u=\ \ 0.54402-1.39007I$ $a=-0.321827-1.239280I$ $b=\ \ 1.89776+0.22684I$	$-15.4360-5.9041I$	$-9.72541+2.82977I$
$u=\ \ 0.305633$ $a=\ \ 2.41054$ $b=-0.736738$	-1.10361	-8.78710

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

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ u+1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ u+1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u \\ u+1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u+2 \\ -1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u - 7$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = 0.500000 + 0.866025I$ $b = -1.00000$	$-1.64493 - 2.02988I$	$-9.00000 + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = 0.500000 - 0.866025I$ $b = -1.00000$	$-1.64493 + 2.02988I$	$-9.00000 - 3.46410I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^2(u^8 + u^7 - 7u^6 - 4u^5 + 16u^4 - 3u^3 - 9u^2 - 8u - 4)$
c_2	$(u^2 - u + 1)(u^8 + 2u^7 + 5u^6 + 6u^5 + 7u^4 + 7u^3 + 4u^2 + 4u + 1)$
c_3	$(u^2 + u + 1)(u^8 - 2u^7 - 7u^6 + 12u^5 + 5u^4 + 3u^3 - 2u^2 + 2u + 1)$
c_4	$(u - 1)^2(u^8 - 3u^7 - 2u^6 + 9u^5 + 5u^4 - 13u^3 - 3u^2 + 3u - 1)$
c_6	$((u - 1)^2)(u^8 + 13u^7 + \cdots + 3u + 1)$
c_7	$(u + 1)^2(u^8 - 3u^7 - 2u^6 + 9u^5 + 5u^4 - 13u^3 - 3u^2 + 3u - 1)$
c_8	$(u^2 + u + 1)(u^8 + 2u^7 + 5u^6 + 6u^5 + 7u^4 + 7u^3 + 4u^2 + 4u + 1)$
c_9	$(u^2 + u + 1)(u^8 + 6u^7 + 15u^6 + 14u^5 - 9u^4 - 31u^3 - 26u^2 - 8u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^2(y^8 - 15y^7 + 89y^6 - 252y^5 + 366y^4 - 305y^3 - 95y^2 + 8y + 16)$
c_2, c_8	$(y^2 + y + 1)(y^8 + 6y^7 + 15y^6 + 14y^5 - 9y^4 - 31y^3 - 26y^2 - 8y + 1)$
c_3	$(y^2 + y + 1)(y^8 - 18y^7 + \cdots - 8y + 1)$
c_4, c_7	$((y - 1)^2)(y^8 - 13y^7 + \cdots - 3y + 1)$
c_6	$((y - 1)^2)(y^8 - 33y^7 + \cdots + 145y + 1)$
c_9	$(y^2 + y + 1)$ $\cdot\,(y^8 - 6y^7 + 39y^6 - 146y^5 + 267y^4 - 239y^3 + 162y^2 - 116y + 1)$