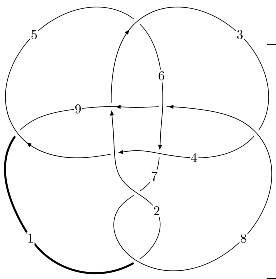
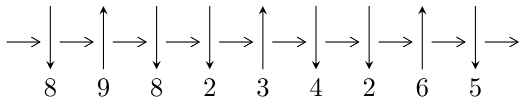
9_{47} $(K9n_7)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle b+u,\ a-1,\ u^4+2u^3+3u^2+u+1\rangle \\
I_2^u &= \langle b+u,\ a+1,\ u^3-u^2+1\rangle \\
I_3^u &= \langle b+u,\ -u^3+2u^2+a-2u+1,\ u^4-u^3+u^2+1\rangle \\
I_4^u &= \langle -u^3-3u^2+b-4u-1,\ -u^3-2u^2+2a-u+3,\ u^4+4u^3+7u^2+5u+2\rangle \\
I_5^u &= \langle -u^3+u^2+b-u-1,\ a-1,\ u^4-u^3+u^2+1\rangle
\end{aligned}$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 19 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. $I_1^u = \langle b+u,\ a-1,\ u^4+2u^3+3u^2+u+1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ -u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u+1 \\ -u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^3-u^2+1 \\ -2u^2-u-1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^3-u^2 \\ -3u^2-u-1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u \\ u^2+u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3-2u^2-u \\ u^3+u^2+u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3-2u^2-u \\ u^3+u^2+u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -3u^3-9u^2-9u-9$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6 c_7	$u^4 - 3u^3 + u^2 + 2u + 1$
c_2, c_5, c_8	$u^4 + 2u^3 + 3u^2 + u + 1$
c_3, c_9	$u^4 + 4u^3 + 7u^2 + 5u + 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_7	$y^4 - 7y^3 + 15y^2 - 2y + 1$
c_2, c_5, c_8	$y^4 + 2y^3 + 7y^2 + 5y + 1$
c_3, c_9	$y^4 - 2y^3 + 13y^2 + 3y + 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.043315 + 0.641200I$ $a = 1.00000$ $b = 0.043315 - 0.641200I$	$-0.858683 + 1.068330I$	$-5.08685 - 4.49083I$
$u = -0.043315 - 0.641200I$ $a = 1.00000$ $b = 0.043315 + 0.641200I$	$-0.858683 - 1.068330I$	$-5.08685 + 4.49083I$
$u = -0.95668 + 1.22719I$ $a = 1.00000$ $b = 0.95668 - 1.22719I$	$-8.18845 - 10.05000I$	$-5.41315 + 5.52365I$
$u = -0.95668 - 1.22719I$ $a = 1.00000$ $b = 0.95668 + 1.22719I$	$-8.18845 + 10.05000I$	$-5.41315 - 5.52365I$

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

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

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

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

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6u^2+3u$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6	$u^3 + 2u^2 + u + 1$
c_2, c_5, c_8	$u^3 - u^2 + 1$
c_3, c_9	$u^3 - u + 1$
c_7	$u^3 - 2u^2 + u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_7	$y^3 - 2y^2 - 3y - 1$
c_2, c_5, c_8	$y^3 - y^2 + 2y - 1$
c_3, c_9	$y^3 - 2y^2 + y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.877439 + 0.744862I$ $a = -1.00000$ $b = -0.877439 - 0.744862I$	$1.45094 + 3.77083I$	$1.34184 - 5.60826I$
$u = 0.877439 - 0.744862I$ $a = -1.00000$ $b = -0.877439 + 0.744862I$	$1.45094 - 3.77083I$	$1.34184 + 5.60826I$
$u = -0.754878$ $a = -1.00000$ $b = 0.754878$	-6.19175	-5.68370

III. $I_3^u = \langle b+u,\ -u^3+2u^2+a-2u+1,\ u^4-u^3+u^2+1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^3-2u^2+2u-1 \\ -u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^3-2u^2+3u-1 \\ -u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -2u^2+3u-2 \\ 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u^3+u^2-3u+4 \\ -u^3+u^2-u-1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -2u^2+3u-3 \\ 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3-2u^2+5u-5 \\ u^3+1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3-2u^2+5u-5 \\ u^3+1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6, c_7	$u^4 + 3u^3 + u^2 - 2u + 1$
c_2, c_5	$u^4 - u^3 + u^2 + 1$
c_3	$(u-1)^4$
c_4	$u^4 - 2u^3 + u^2 - 3u + 4$
c_8	$u^4 + 4u^3 + 7u^2 + 5u + 2$
c_9	$u^4 + 5u^3 + 12u^2 + 12u + 8$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6, c_7	$y^4 - 7y^3 + 15y^2 - 2y + 1$
c_2, c_5	$y^4 + y^3 + 3y^2 + 2y + 1$
c_3	$(y-1)^4$
c_4	$y^4 - 2y^3 - 3y^2 - y + 16$
c_8	$y^4 - 2y^3 + 13y^2 + 3y + 4$
c_9	$y^4 - y^3 + 40y^2 + 48y + 64$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351808 + 0.720342I$ $a = -0.40926 + 2.34806I$ $b = 0.351808 - 0.720342I$	$-6.79074 - 1.41510I$	$-9.82674 + 4.90874I$
$u = -0.351808 - 0.720342I$ $a = -0.40926 - 2.34806I$ $b = 0.351808 + 0.720342I$	$-6.79074 + 1.41510I$	$-9.82674 - 4.90874I$
$u = 0.851808 + 0.911292I$ $a = -0.590739 - 0.055548I$ $b = -0.851808 - 0.911292I$	$0.21101 + 3.16396I$	$-6.17326 - 2.56480I$
$u = 0.851808 - 0.911292I$ $a = -0.590739 + 0.055548I$ $b = -0.851808 + 0.911292I$	$0.21101 - 3.16396I$	$-6.17326 + 2.56480I$

IV.

$\boldsymbol{I_4^u = \langle -u^3 - 3u^2 + b - 4u - 1,\ -u^3 - 2u^2 + 2a - u + 3,\ u^4 + 4u^3 + 7u^2 + 5u + 2\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix} \frac{1}{2}u^3 + u^2 - \frac{1}{2}u - \frac{3}{2} \\ u^3 + 6u^2 + 7u + 3 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{5}{2}u^3 + 8u^2 + \frac{19}{2}u + \frac{5}{2} \\ u^3 + 7u^2 + 8u + 5 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{3}{2}u^3 - 5u^2 - \frac{13}{2}u - \frac{3}{2} \\ -u^3 - 4u^2 - 5u - 3 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u^3 + 2u^2 + \frac{7}{2}u + \frac{5}{2} \\ -u^3 - 3u^2 - 3u - 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u^3 + 2u^2 + \frac{7}{2}u + \frac{5}{2} \\ -u^3 - 3u^2 - 3u - 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^2 + 8u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_7	$u^4 + 3u^3 + u^2 - 2u + 1$
c_2	$u^4 + 4u^3 + 7u^2 + 5u + 2$
c_3	$u^4 + 5u^3 + 12u^2 + 12u + 8$
c_5, c_8	$u^4 - u^3 + u^2 + 1$
c_6	$u^4 - 2u^3 + u^2 - 3u + 4$
c_9	$(u - 1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_7	$y^4 - 7y^3 + 15y^2 - 2y + 1$
c_2	$y^4 - 2y^3 + 13y^2 + 3y + 4$
c_3	$y^4 - y^3 + 40y^2 + 48y + 64$
c_5, c_8	$y^4 + y^3 + 3y^2 + 2y + 1$
c_6	$y^4 - 2y^3 - 3y^2 - y + 16$
c_9	$(y-1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.452576+0.585652I$ $a=-1.67796-0.15778I$ $b=-0.851808+0.911292I$	$0.21101-3.16396I$	$-6.17326+2.56480I$
$u=-0.452576-0.585652I$ $a=-1.67796+0.15778I$ $b=-0.851808-0.911292I$	$0.21101+3.16396I$	$-6.17326-2.56480I$
$u=-1.54742+1.12087I$ $a=-0.072042+0.413327I$ $b=\ \ 0.351808+0.720342I$	$-6.79074+1.41510I$	$-9.82674-4.90874I$
$u=-1.54742-1.12087I$ $a=-0.072042-0.413327I$ $b=\ \ 0.351808-0.720342I$	$-6.79074-1.41510I$	$-9.82674+4.90874I$

V. $I^u_5 = \langle -u^3+u^2+b-u-1,\ a-1,\ u^4-u^3+u^2+1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^3-u^2+u+1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^3+u^2-u \\ u^3-u^2+u+1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u+1 \\ 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^3+u-1 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u \\ 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3-u^2+u \\ -u^3+u^2-1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3-u^2+u \\ -u^3+u^2-1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$u^4 - 2u^3 + u^2 - 3u + 4$
c_2, c_8	$u^4 - u^3 + u^2 + 1$
c_3, c_9	$(u-1)^4$
c_4, c_6	$u^4 + 3u^3 + u^2 - 2u + 1$
c_5	$u^4 + 4u^3 + 7u^2 + 5u + 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y^4 - 2y^3 - 3y^2 - y + 16$
c_2, c_8	$y^4 + y^3 + 3y^2 + 2y + 1$
c_3, c_9	$(y-1)^4$
c_4, c_6	$y^4 - 7y^3 + 15y^2 - 2y + 1$
c_5	$y^4 - 2y^3 + 13y^2 + 3y + 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351808 + 0.720342I$ $a = 1.00000$ $b = 1.54742 + 1.12087I$	$-6.79074 - 1.41510I$	$-9.82674 + 4.90874I$
$u = -0.351808 - 0.720342I$ $a = 1.00000$ $b = 1.54742 - 1.12087I$	$-6.79074 + 1.41510I$	$-9.82674 - 4.90874I$
$u = 0.851808 + 0.911292I$ $a = 1.00000$ $b = 0.452576 + 0.585652I$	$0.21101 + 3.16396I$	$-6.17326 - 2.56480I$
$u = 0.851808 - 0.911292I$ $a = 1.00000$ $b = 0.452576 - 0.585652I$	$0.21101 - 3.16396I$	$-6.17326 + 2.56480I$

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6	$(u^3+2u^2+u+1)(u^4-3u^3+u^2+2u+1)(u^4-2u^3+u^2-3u+4)$ $\cdot(u^4+3u^3+u^2-2u+1)^2$
c_2, c_5, c_8	$(u^3-u^2+1)(u^4-u^3+u^2+1)^2(u^4+2u^3+3u^2+u+1)$ $\cdot(u^4+4u^3+7u^2+5u+2)$
c_3, c_9	$((u-1)^8)(u^3-u+1)(u^4+4u^3+\cdots+5u+2)(u^4+5u^3+\cdots+12u+8)$
c_7	$(u^3-2u^2+u-1)(u^4-3u^3+u^2+2u+1)(u^4-2u^3+u^2-3u+4)$ $\cdot(u^4+3u^3+u^2-2u+1)^2$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_7	$(y^3-2y^2-3y-1)(y^4-7y^3+\cdots-2y+1)^3(y^4-2y^3+\cdots-y+16)$
c_2, c_5, c_8	$(y^3-y^2+2y-1)(y^4-2y^3+\cdots+3y+4)(y^4+y^3+3y^2+2y+1)^2$ $\cdot(y^4+2y^3+7y^2+5y+1)$
c_3, c_9	$(y-1)^8(y^3-2y^2+y-1)(y^4-2y^3+13y^2+3y+4)$ $\cdot(y^4-y^3+40y^2+48y+64)$