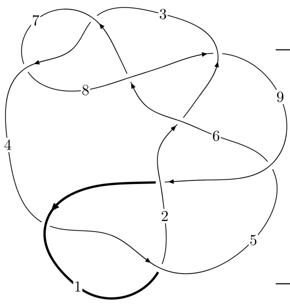
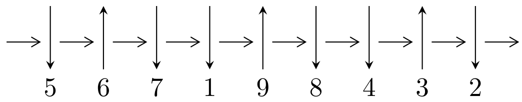
9_{31} $(K9a_{13})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^7 - 2u^5 + 2u^3 - u^2 + 1 \rangle$$
$$I_2^u = \langle u^{20} + u^{19} + \cdots + 2u + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 27 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. $\boldsymbol{I^u_1 = \langle u^7 - 2u^5 + 2u^3 - u^2 + 1 \rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^4 - u^2 + 1 \\ u^4 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^2 - 1 \\ u^5 + u^4 - 2u^3 + u - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ -u^6 + u^4 + u^3 + 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ u^5 - u^4 - 2u^3 + u^2 - 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ u^5 - u^4 - 2u^3 + u^2 - 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^5 + 4u^4 - 8u^3 - 4u^2 + 4u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7	$u^7 - 2u^5 + 2u^3 - u^2 + 1$
c_2	$u^7 - 5u^6 + 12u^5 - 17u^4 + 15u^3 - 5u^2 - 4u + 4$
c_5, c_8	$u^7 + 2u^5 - 2u^4 + 4u^3 - u^2 + 2u + 1$
c_6, c_9	$u^7 + 4u^6 + 8u^5 + 8u^4 + 4u^3 + u^2 + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7	$y^7 - 4y^6 + 8y^5 - 8y^4 + 4y^3 - y^2 + 2y - 1$
c_2	$y^7 - y^6 + 4y^5 + 13y^4 - y^3 - 9y^2 + 56y - 16$
c_5, c_8	$y^7 + 4y^6 + 12y^5 + 16y^4 + 20y^3 + 19y^2 + 6y - 1$
c_6, c_9	$y^7 + 8y^5 - 4y^4 + 24y^3 - y^2 + 2y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 1.125110 + 0.343189I$	$-5.94607 - 3.76357I$	$-10.60460 + 4.24459I$
$u = \quad 1.125110 - 0.343189I$	$-5.94607 + 3.76357I$	$-10.60460 - 4.24459I$
$u = \quad 0.364544 + 0.701794I$	$1.82567 + 1.84683I$	$1.12815 - 1.09324I$
$u = \quad 0.364544 - 0.701794I$	$1.82567 - 1.84683I$	$1.12815 + 1.09324I$
$u = -1.125830 + 0.566290I$	$-2.65707 + 11.68630I$	$-5.70307 - 8.84509I$
$u = -1.125830 - 0.566290I$	$-2.65707 - 11.68630I$	$-5.70307 + 8.84509I$
$u = -0.727635$	-1.24946	-7.64100

II. $I^u_2 = \langle u^{20} + u^{19} - 4u^{18} - 5u^{17} + 8u^{16} + 13u^{15} - 7u^{14} - 20u^{13} - u^{12} + 19u^{11} + 10u^{10} - 10u^9 - 11u^8 + 2u^7 + 7u^6 + u^5 - 3u^4 - u^3 + 2u^2 + 2u + 1\rangle$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

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

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

$$a_2 = \begin{pmatrix} u^7 - 2u^5 + 2u^3 \\ u^9 - u^7 + u^5 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^{19} - u^{18} + \cdots - 3u^2 - 2u \\ u^{11} - 3u^9 + 4u^7 - 3u^5 + u^3 - u - 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^{12} - 3u^{10} + 5u^8 - 4u^6 + 2u^4 - u^2 + 1 \\ u^{12} - 2u^{10} + 2u^8 - u^4 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^{12} - 3u^{10} + 5u^8 - 4u^6 + 2u^4 - u^2 + 1 \\ u^{12} - 2u^{10} + 2u^8 - u^4 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= 4u^{18} - 16u^{16} + 36u^{14} - 48u^{12} + 44u^{10} - 28u^8 - 4u^7 + 16u^6 + 8u^5 - 8u^4 - 8u^3 + 4u^2 + 4u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7	$u^{20} + u^{19} + \cdots + 2u + 1$
c_2	$(u^{10} + 2u^9 + u^8 + 4u^6 + 6u^5 + u^4 - 6u^3 - 5u^2 + 1)^2$
c_5, c_8	$u^{20} + 3u^{19} + \cdots + 16u + 5$
c_6, c_9	$u^{20} + 9u^{19} + \cdots + 2u^2 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7	$y^{20} - 9y^{19} + \cdots + 2y^2 + 1$
c_2	$(y^{10} - 2y^9 + \cdots - 10y + 1)^2$
c_5, c_8	$y^{20} + 3y^{19} + \cdots + 204y + 25$
c_6, c_9	$y^{20} + 3y^{19} + \cdots + 4y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.941429 + 0.547698I$	0.197299	$-2.26625 + 0.I$
$u = -0.941429 - 0.547698I$	0.197299	$-2.26625 + 0.I$
$u = -1.061040 + 0.273586I$	$-2.27340 + 0.51998I$	$-5.71661 - 0.77505I$
$u = -1.061040 - 0.273586I$	$-2.27340 - 0.51998I$	$-5.71661 + 0.77505I$
$u = -0.626658 + 0.633601I$	$1.11960 + 4.65452I$	$-0.79654 - 6.04247I$
$u = -0.626658 - 0.633601I$	$1.11960 - 4.65452I$	$-0.79654 + 6.04247I$
$u = 1.128770 + 0.240119I$	$-4.83313 + 3.92983I$	$-9.04400 - 3.21471I$
$u = 1.128770 - 0.240119I$	$-4.83313 - 3.92983I$	$-9.04400 + 3.21471I$
$u = 1.016360 + 0.552370I$	$1.11960 - 4.65452I$	$-0.79654 + 6.04247I$
$u = 1.016360 - 0.552370I$	$1.11960 + 4.65452I$	$-0.79654 - 6.04247I$
$u = -0.330984 + 0.758157I$	$-0.32496 - 6.68616I$	$-2.49331 + 5.21994I$
$u = -0.330984 - 0.758157I$	$-0.32496 + 6.68616I$	$-2.49331 - 5.21994I$
$u = 0.527984 + 0.630206I$	2.55688	$2.36717 + 0.I$
$u = 0.527984 - 0.630206I$	2.55688	$2.36717 + 0.I$
$u = -1.119570 + 0.508145I$	$-4.83313 + 3.92983I$	$-9.04400 - 3.21471I$
$u = -1.119570 - 0.508145I$	$-4.83313 - 3.92983I$	$-9.04400 + 3.21471I$
$u = 1.102100 + 0.557039I$	$-0.32496 - 6.68616I$	$-2.49331 + 5.21994I$
$u = 1.102100 - 0.557039I$	$-0.32496 + 6.68616I$	$-2.49331 - 5.21994I$
$u = -0.195538 + 0.653472I$	$-2.27340 + 0.51998I$	$-5.71661 - 0.77505I$
$u = -0.195538 - 0.653472I$	$-2.27340 - 0.51998I$	$-5.71661 + 0.77505I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7	$(u^7 - 2u^5 + 2u^3 - u^2 + 1)(u^{20} + u^{19} + \cdots + 2u + 1)$
c_2	$(u^7 - 5u^6 + 12u^5 - 17u^4 + 15u^3 - 5u^2 - 4u + 4)$ $\cdot\,(u^{10} + 2u^9 + u^8 + 4u^6 + 6u^5 + u^4 - 6u^3 - 5u^2 + 1)^2$
c_5, c_8	$(u^7 + 2u^5 - 2u^4 + 4u^3 - u^2 + 2u + 1)(u^{20} + 3u^{19} + \cdots + 16u + 5)$
c_6, c_9	$(u^7 + 4u^6 + \cdots + 2u + 1)(u^{20} + 9u^{19} + \cdots + 2u^2 + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7	$(y^7 - 4y^6 + \cdots + 2y - 1)(y^{20} - 9y^{19} + \cdots + 2y^2 + 1)$
c_2	$(y^7 - y^6 + 4y^5 + 13y^4 - y^3 - 9y^2 + 56y - 16)$ $\cdot (y^{10} - 2y^9 + \cdots - 10y + 1)^2$
c_5, c_8	$(y^7 + 4y^6 + 12y^5 + 16y^4 + 20y^3 + 19y^2 + 6y - 1)$ $\cdot (y^{20} + 3y^{19} + \cdots + 204y + 25)$
c_6, c_9	$(y^7 + 8y^5 + \cdots + 2y - 1)(y^{20} + 3y^{19} + \cdots + 4y + 1)$