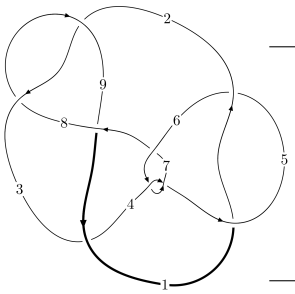
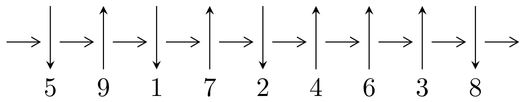
9_{30} ($K9a_1$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^{27} - 4u^{26} + \cdots + 2b - 3,\ -5u^{27} + 14u^{26} + \cdots + 2a + 9,\ u^{28} - 3u^{27} + \cdots - u + 1\rangle$$
$$I_2^u = \langle b + a,\ a^2 - a + 1,\ u + 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 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.
$$\boldsymbol{I_1^u = \langle u^{27}-4u^{26}+\cdots+2b-3,\ -5u^{27}+14u^{26}+\cdots+2a+9,\ u^{28}-3u^{27}+\cdots-u+1\rangle}$$

(i) Arc colorings

$$a_4 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}\frac{5}{2}u^{27}-7u^{26}+\cdots+2u-\frac{9}{2}\\-\frac{1}{2}u^{27}+2u^{26}+\cdots+2u+\frac{3}{2}\end{pmatrix}$$
$$a_5 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}\frac{9}{2}u^{27}-10u^{26}+\cdots+2u-\frac{11}{2}\\-\frac{7}{2}u^{27}+9u^{26}+\cdots+u+\frac{9}{2}\end{pmatrix}$$
$$a_3 = \begin{pmatrix}\frac{1}{2}u^{27}-u^{26}+\cdots+u+\frac{3}{2}\\-\frac{1}{2}u^{27}+u^{26}+\cdots-u+\frac{1}{2}\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u\\u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^3\\-u^3+u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}4u^{27}-9u^{26}+\cdots+3u-5\\-\frac{5}{2}u^{27}+6u^{26}+\cdots+2u+\frac{7}{2}\end{pmatrix}$$
$$a_9 = \begin{pmatrix}4u^{27}-9u^{26}+\cdots+3u-5\\-\frac{5}{2}u^{27}+6u^{26}+\cdots+2u+\frac{7}{2}\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $=$
$u^{27}-u^{26}-3u^{25}+6u^{24}-5u^{22}+13u^{21}-24u^{20}-3u^{19}+81u^{18}-69u^{17}-92u^{16}+190u^{15}+6u^{14}-242u^{13}+142u^{12}+176u^{11}-212u^{10}-40u^{9}+182u^{8}-38u^{7}-93u^{6}+53u^{5}+30u^{4}-29u^{3}-u^{2}+9u$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{28} + u^{27} + \cdots + 8u + 4$
c_2, c_8	$u^{28} + 2u^{27} + \cdots + 2u + 1$
c_3	$u^{28} - 2u^{27} + \cdots - 22u + 17$
c_4, c_6	$u^{28} + 3u^{27} + \cdots + u + 1$
c_7	$u^{28} - 13u^{27} + \cdots + 7u + 1$
c_9	$u^{28} + 14u^{27} + \cdots + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{28} - 15y^{27} + \cdots - 88y + 16$
c_2, c_8	$y^{28} + 14y^{27} + \cdots + 2y + 1$
c_3	$y^{28} - 10y^{27} + \cdots - 246y + 289$
c_4, c_6	$y^{28} - 13y^{27} + \cdots + 7y + 1$
c_7	$y^{28} + 7y^{27} + \cdots - 61y + 1$
c_9	$y^{28} + 2y^{27} + \cdots + 14y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.421904 + 0.904838I$ $a = -0.038492 - 0.189970I$ $b = -1.43260 - 0.55257I$	$-5.32101 - 6.23266I$	$-4.14975 + 4.30079I$
$u = 0.421904 - 0.904838I$ $a = -0.038492 + 0.189970I$ $b = -1.43260 + 0.55257I$	$-5.32101 + 6.23266I$	$-4.14975 - 4.30079I$
$u = -0.959758 + 0.402988I$ $a = -0.766770 + 1.057520I$ $b = -0.623667 - 0.562813I$	$1.85217 - 1.40144I$	$4.69947 + 1.74630I$
$u = -0.959758 - 0.402988I$ $a = -0.766770 - 1.057520I$ $b = -0.623667 + 0.562813I$	$1.85217 + 1.40144I$	$4.69947 - 1.74630I$
$u = 0.619172 + 0.839658I$ $a = -0.016226 + 0.286921I$ $b = -1.019470 - 0.068324I$	$-6.61232 + 2.08114I$	$-5.79595 - 2.78862I$
$u = 0.619172 - 0.839658I$ $a = -0.016226 - 0.286921I$ $b = -1.019470 + 0.068324I$	$-6.61232 - 2.08114I$	$-5.79595 + 2.78862I$
$u = 0.963620 + 0.456689I$ $a = 0.72093 + 1.60659I$ $b = -0.015157 - 1.395580I$	$1.56772 + 4.24816I$	$1.88645 - 6.97904I$
$u = 0.963620 - 0.456689I$ $a = 0.72093 - 1.60659I$ $b = -0.015157 + 1.395580I$	$1.56772 - 4.24816I$	$1.88645 + 6.97904I$
$u = 0.855481 + 0.371946I$ $a = -1.18245 - 1.31391I$ $b = 0.66840 + 1.28739I$	$0.967687 - 0.906276I$	$-0.59768 - 1.67094I$
$u = 0.855481 - 0.371946I$ $a = -1.18245 + 1.31391I$ $b = 0.66840 - 1.28739I$	$0.967687 + 0.906276I$	$-0.59768 + 1.67094I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.454354 + 0.784849I$ $a = -0.204179 + 0.058390I$ $b = 1.105360 + 0.510425I$	$-2.52313 - 1.47542I$	$-1.29345 + 0.59666I$
$u = 0.454354 - 0.784849I$ $a = -0.204179 - 0.058390I$ $b = 1.105360 - 0.510425I$	$-2.52313 + 1.47542I$	$-1.29345 - 0.59666I$
$u = -0.962167 + 0.550809I$ $a = 0.83827 - 1.25040I$ $b = 1.191130 + 0.619206I$	$-0.41268 - 5.75423I$	$0.10698 + 5.96655I$
$u = -0.962167 - 0.550809I$ $a = 0.83827 + 1.25040I$ $b = 1.191130 - 0.619206I$	$-0.41268 + 5.75423I$	$0.10698 - 5.96655I$
$u = -1.126550 + 0.202617I$ $a = -0.903208 + 0.571058I$ $b = 0.236722 - 0.655524I$	$2.40233 - 0.64414I$	$4.35398 - 1.30683I$
$u = -1.126550 - 0.202617I$ $a = -0.903208 - 0.571058I$ $b = 0.236722 + 0.655524I$	$2.40233 + 0.64414I$	$4.35398 + 1.30683I$
$u = -0.668097 + 0.525777I$ $a = 0.55770 - 1.31624I$ $b = 0.847077 - 0.345927I$	$-1.32210 + 1.34593I$	$-1.91932 - 0.66126I$
$u = -0.668097 - 0.525777I$ $a = 0.55770 + 1.31624I$ $b = 0.847077 + 0.345927I$	$-1.32210 - 1.34593I$	$-1.91932 + 0.66126I$
$u = 1.021030 + 0.695890I$ $a = 0.04209 - 1.42194I$ $b = -0.763781 + 0.287418I$	$-5.39487 + 3.62399I$	$-4.20871 - 2.76186I$
$u = 1.021030 - 0.695890I$ $a = 0.04209 + 1.42194I$ $b = -0.763781 - 0.287418I$	$-5.39487 - 3.62399I$	$-4.20871 + 2.76186I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.099170 + 0.618751I$		
$a = 0.03996 + 1.72641I$	$-0.59978 + 6.77427I$	$1.77406 - 4.95962I$
$b = 1.13985 - 0.88919I$		
$u = 1.099170 - 0.618751I$		
$a = 0.03996 - 1.72641I$	$-0.59978 - 6.77427I$	$1.77406 + 4.95962I$
$b = 1.13985 + 0.88919I$		
$u = -1.278740 + 0.117832I$		
$a = 1.225830 - 0.293847I$	$0.65193 + 3.28147I$	$-1.23266 - 4.99392I$
$b = -0.991759 + 0.593054I$		
$u = -1.278740 - 0.117832I$		
$a = 1.225830 + 0.293847I$	$0.65193 - 3.28147I$	$-1.23266 + 4.99392I$
$b = -0.991759 - 0.593054I$		
$u = 1.146350 + 0.652255I$		
$a = 0.11235 - 1.78840I$	$-3.12706 + 11.95450I$	$-1.04116 - 8.32221I$
$b = -1.53314 + 0.75996I$		
$u = 1.146350 - 0.652255I$		
$a = 0.11235 + 1.78840I$	$-3.12706 - 11.95450I$	$-1.04116 + 8.32221I$
$b = -1.53314 - 0.75996I$		
$u = -0.085781 + 0.348606I$		
$a = -0.92580 + 1.34078I$	$-0.22315 - 1.43304I$	$-1.58225 + 4.97603I$
$b = 0.191038 + 0.606129I$		
$u = -0.085781 - 0.348606I$		
$a = -0.92580 - 1.34078I$	$-0.22315 + 1.43304I$	$-1.58225 - 4.97603I$
$b = 0.191038 - 0.606129I$		

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4a+1$

(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	$(u+1)^2$
c_6, 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
$u = -1.00000$ $a = \quad 0.500000 + 0.866025I$ $b = -0.500000 - 0.866025I$	$1.64493 - 2.02988I$	$3.00000 + 3.46410I$
$u = -1.00000$ $a = \quad 0.500000 - 0.866025I$ $b = -0.500000 + 0.866025I$	$1.64493 + 2.02988I$	$3.00000 - 3.46410I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^2(u^{28} + u^{27} + \cdots + 8u + 4)$
c_2	$(u^2 - u + 1)(u^{28} + 2u^{27} + \cdots + 2u + 1)$
c_3	$(u^2 + u + 1)(u^{28} - 2u^{27} + \cdots - 22u + 17)$
c_4	$((u + 1)^2)(u^{28} + 3u^{27} + \cdots + u + 1)$
c_6	$((u - 1)^2)(u^{28} + 3u^{27} + \cdots + u + 1)$
c_7	$((u - 1)^2)(u^{28} - 13u^{27} + \cdots + 7u + 1)$
c_8	$(u^2 + u + 1)(u^{28} + 2u^{27} + \cdots + 2u + 1)$
c_9	$(u^2 + u + 1)(u^{28} + 14u^{27} + \cdots + 2u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^2(y^{28} - 15y^{27} + \cdots - 88y + 16)$
c_2, c_8	$(y^2 + y + 1)(y^{28} + 14y^{27} + \cdots + 2y + 1)$
c_3	$(y^2 + y + 1)(y^{28} - 10y^{27} + \cdots - 246y + 289)$
c_4, c_6	$((y - 1)^2)(y^{28} - 13y^{27} + \cdots + 7y + 1)$
c_7	$((y - 1)^2)(y^{28} + 7y^{27} + \cdots - 61y + 1)$
c_9	$(y^2 + y + 1)(y^{28} + 2y^{27} + \cdots + 14y + 1)$