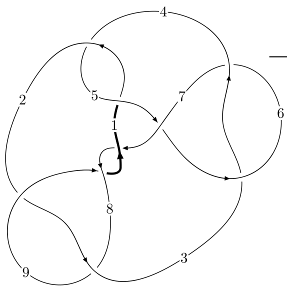
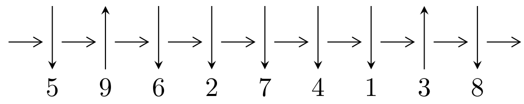
9_{25} $(K9a_4)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{24} - 2u^{23} + \cdots + 2b + 1,\ -u^{24} - 2u^{23} + \cdots + a + 5u,\ u^{25} + 3u^{24} + \cdots - 4u - 1 \rangle$$
$$I_2^u = \langle 2b - a - 1,\ a^2 + 3,\ u - 1 \rangle$$

* 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. $I^u_1 = \langle -u^{24}-2u^{23}+\cdots+2b+1,\ -u^{24}-2u^{23}+\cdots+a+5u,\ u^{25}+3u^{24}+\cdots-4u-1\rangle$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix}0\\u\end{pmatrix}$$

$$a_4 = \begin{pmatrix}1\\u^2\end{pmatrix}$$

$$a_7 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$

$$a_9 = \begin{pmatrix}u^{24}+2u^{23}+\cdots-5u^2-5u\\\frac{1}{2}u^{24}+u^{23}+\cdots-\frac{7}{2}u-\frac{1}{2}\end{pmatrix}$$

$$a_2 = \begin{pmatrix}\frac{7}{2}u^{24}+9u^{23}+\cdots-\frac{33}{2}u-\frac{9}{2}\\\frac{3}{2}u^{24}+4u^{23}+\cdots-\frac{13}{2}u-\frac{5}{2}\end{pmatrix}$$

$$a_5 = \begin{pmatrix}u^3\\u^5-u^3+u\end{pmatrix}$$

$$a_1 = \begin{pmatrix}\frac{3}{2}u^{24}+3u^{23}+\cdots-\frac{15}{2}u-\frac{3}{2}\\\frac{5}{2}u^{24}+6u^{23}+\cdots-\frac{21}{2}u-\frac{7}{2}\end{pmatrix}$$

$$a_8 = \begin{pmatrix}\frac{1}{2}u^{24}+u^{23}+\cdots-\frac{3}{2}u+\frac{1}{2}\\\frac{1}{2}u^{24}+u^{23}+\cdots-\frac{7}{2}u-\frac{1}{2}\end{pmatrix}$$

$$a_8 = \begin{pmatrix}\frac{1}{2}u^{24}+u^{23}+\cdots-\frac{3}{2}u+\frac{1}{2}\\\frac{1}{2}u^{24}+u^{23}+\cdots-\frac{7}{2}u-\frac{1}{2}\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2u^{24}+7u^{23}-5u^{22}-42u^{21}-25u^{20}+108u^{19}+144u^{18}-128u^{17}-357u^{16}+2u^{15}+526u^{14}+286u^{13}-498u^{12}-538u^{11}+238u^{10}+584u^9+35u^8-389u^7-165u^6+164u^5+119u^4-22u^3-38u^2-6u-5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^{25} - u^{24} + \cdots + 4u + 4$
c_2, c_8	$u^{25} + 2u^{24} + \cdots + 3u + 1$
c_3, c_6	$u^{25} - 3u^{24} + \cdots - 4u + 1$
c_5	$u^{25} + 11u^{24} + \cdots - 2u + 1$
c_7, c_9	$u^{25} + 8u^{24} + \cdots + 11u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^{25} + 15y^{24} + \cdots - 88y - 16$
c_2, c_8	$y^{25} + 8y^{24} + \cdots + 11y - 1$
c_3, c_6	$y^{25} - 11y^{24} + \cdots - 2y - 1$
c_5	$y^{25} + 9y^{24} + \cdots - 2y - 1$
c_7, c_9	$y^{25} + 20y^{24} + \cdots + 251y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.781818 + 0.585895I$ $a = -0.235890 - 0.629868I$ $b = 0.734813 + 0.804167I$	$1.52493 + 0.43356I$	$-3.08804 + 0.04506I$
$u = 0.781818 - 0.585895I$ $a = -0.235890 + 0.629868I$ $b = 0.734813 - 0.804167I$	$1.52493 - 0.43356I$	$-3.08804 - 0.04506I$
$u = -0.840318 + 0.621070I$ $a = 0.114344 + 0.489930I$ $b = 0.723797 + 0.117969I$	$2.10182 + 2.44039I$	$-0.16599 - 3.61173I$
$u = -0.840318 - 0.621070I$ $a = 0.114344 - 0.489930I$ $b = 0.723797 - 0.117969I$	$2.10182 - 2.44039I$	$-0.16599 + 3.61173I$
$u = -0.479273 + 0.936834I$ $a = 0.544317 + 0.502084I$ $b = -0.776571 + 0.974090I$	$6.34798 - 5.44271I$	$-0.49829 + 3.51350I$
$u = -0.479273 - 0.936834I$ $a = 0.544317 - 0.502084I$ $b = -0.776571 - 0.974090I$	$6.34798 + 5.44271I$	$-0.49829 - 3.51350I$
$u = -0.563663 + 0.911236I$ $a = 0.646213 - 0.436873I$ $b = -0.842489 - 0.787076I$	$6.92874 + 0.59688I$	$0.46758 - 1.80507I$
$u = -0.563663 - 0.911236I$ $a = 0.646213 + 0.436873I$ $b = -0.842489 + 0.787076I$	$6.92874 - 0.59688I$	$0.46758 + 1.80507I$
$u = 0.903290 + 0.591334I$ $a = -1.72740 - 1.15219I$ $b = 0.719637 - 0.929655I$	$1.14086 - 5.11531I$	$-4.18255 + 5.48464I$
$u = 0.903290 - 0.591334I$ $a = -1.72740 + 1.15219I$ $b = 0.719637 + 0.929655I$	$1.14086 + 5.11531I$	$-4.18255 - 5.48464I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.073950 + 0.294320I$ $a = 1.15104 + 1.96262I$ $b = -0.071208 + 0.875733I$	$-3.46537 - 1.05922I$	$-11.39395 + 0.37058I$
$u = 1.073950 - 0.294320I$ $a = 1.15104 - 1.96262I$ $b = -0.071208 - 0.875733I$	$-3.46537 + 1.05922I$	$-11.39395 - 0.37058I$
$u = -1.012760 + 0.537221I$ $a = -0.77689 + 2.25052I$ $b = 0.204213 + 1.096690I$	$-1.91594 + 5.41987I$	$-7.35697 - 6.54919I$
$u = -1.012760 - 0.537221I$ $a = -0.77689 - 2.25052I$ $b = 0.204213 - 1.096690I$	$-1.91594 - 5.41987I$	$-7.35697 + 6.54919I$
$u = 0.819709$ $a = 0.530934$ $b = -0.251925$	-1.19408	-8.44380
$u = -0.706780 + 0.369020I$ $a = 0.42079 - 1.91115I$ $b = 0.427994 - 1.010940I$	$-0.62342 - 1.39976I$	$-3.04278 + 0.06062I$
$u = -0.706780 - 0.369020I$ $a = 0.42079 + 1.91115I$ $b = 0.427994 + 1.010940I$	$-0.62342 + 1.39976I$	$-3.04278 - 0.06062I$
$u = -1.089150 + 0.711472I$ $a = -0.490999 - 0.203095I$ $b = -0.865451 + 0.706038I$	$5.32382 + 5.36637I$	$-1.53322 - 3.05337I$
$u = -1.089150 - 0.711472I$ $a = -0.490999 + 0.203095I$ $b = -0.865451 - 0.706038I$	$5.32382 - 5.36637I$	$-1.53322 + 3.05337I$
$u = 1.306760 + 0.052319I$ $a = -0.27343 - 1.51011I$ $b = -0.691717 - 0.872891I$	$-0.20167 + 2.66172I$	$-2.71477 - 3.57661I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.306760 - 0.052319I$ $a = -0.27343 + 1.51011I$ $b = -0.691717 + 0.872891I$	$-0.20167 - 2.66172I$	$-2.71477 + 3.57661I$
$u = -1.139240 + 0.687767I$ $a = 1.14519 - 1.80727I$ $b = -0.753308 - 1.027550I$	$4.33274 + 11.39030I$	$-3.28983 - 7.76664I$
$u = -1.139240 - 0.687767I$ $a = 1.14519 + 1.80727I$ $b = -0.753308 + 1.027550I$	$4.33274 - 11.39030I$	$-3.28983 + 7.76664I$
$u = -0.144497 + 0.357570I$ $a = 1.21724 - 0.74670I$ $b = 0.316251 - 0.806276I$	$-0.33578 - 1.50728I$	$-2.97928 + 4.31266I$
$u = -0.144497 - 0.357570I$ $a = 1.21724 + 0.74670I$ $b = 0.316251 + 0.806276I$	$-0.33578 + 1.50728I$	$-2.97928 - 4.31266I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -2a - 9$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000		
$a =$	$1.73205I$	$-1.64493 + 2.02988I$	$-9.00000 - 3.46410I$
$b =$	$0.500000 + 0.866025I$		
$u =$	1.00000		
$a =$	$-1.73205I$	$-1.64493 - 2.02988I$	$-9.00000 + 3.46410I$
$b =$	$0.500000 - 0.866025I$		

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^2(u^{25} - u^{24} + \cdots + 4u + 4)$
c_2	$(u^2 - u + 1)(u^{25} + 2u^{24} + \cdots + 3u + 1)$
c_3	$((u-1)^2)(u^{25} - 3u^{24} + \cdots - 4u + 1)$
c_5	$((u-1)^2)(u^{25} + 11u^{24} + \cdots - 2u + 1)$
c_6	$((u+1)^2)(u^{25} - 3u^{24} + \cdots - 4u + 1)$
c_7	$(u^2 - u + 1)(u^{25} + 8u^{24} + \cdots + 11u - 1)$
c_8	$(u^2 + u + 1)(u^{25} + 2u^{24} + \cdots + 3u + 1)$
c_9	$(u^2 + u + 1)(u^{25} + 8u^{24} + \cdots + 11u - 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^2(y^{25} + 15y^{24} + \cdots - 88y - 16)$
c_2, c_8	$(y^2 + y + 1)(y^{25} + 8y^{24} + \cdots + 11y - 1)$
c_3, c_6	$((y-1)^2)(y^{25} - 11y^{24} + \cdots - 2y - 1)$
c_5	$((y-1)^2)(y^{25} + 9y^{24} + \cdots - 2y - 1)$
c_7, c_9	$(y^2 + y + 1)(y^{25} + 20y^{24} + \cdots + 251y - 1)$