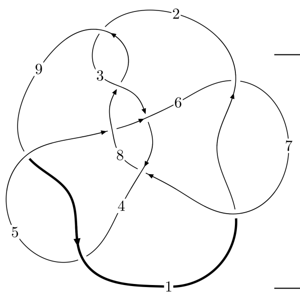
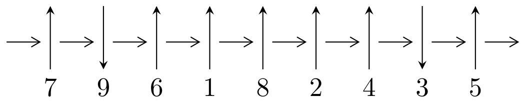
9_{39} $(K9a_{32})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle b-u,\ -17u^{10}-18u^9-65u^8-43u^7-91u^6-38u^5-20u^4+21u^3-8u^2+25a+10u-27, \\
&\quad u^{11}+4u^9-u^8+7u^7-3u^6+4u^5-3u^4+u^3-u^2+u+1\rangle \\
I_2^u &= \langle -63269332u^{19}-195765489u^{18}+\cdots+5993925610b-259471427, \\
&\quad -102509023u^{19}-139045747u^{18}+\cdots+723404815a-1805214375,\ u^{20}+u^{19}+\cdots-8u+7\rangle \\
I_3^u &= \langle b+u,\ -u^3-u^2+a-2u,\ u^4+2u^2-u+1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 35 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. $I^u_1 = \langle b - u,\ -17u^{10} - 18u^9 + \cdots + 25a - 27,\ u^{11} + 4u^9 + \cdots + u + 1\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.680000u^{10} + 0.720000u^9 + \cdots - 0.400000u + 1.08000 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.680000u^{10} + 0.720000u^9 + \cdots + 0.600000u + 1.08000 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.320000u^{10} - 1.28000u^9 + \cdots - 0.400000u - 0.920000 \\ -0.120000u^{10} - 0.480000u^9 + \cdots - 0.400000u - 0.720000 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.720000u^{10} + 0.880000u^9 + \cdots + 0.400000u + 1.32000 \\ \frac{8}{25}u^{10} + \frac{7}{25}u^9 + \cdots + \frac{2}{5}u - \frac{2}{25} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{18}{25}u^{10} - \frac{3}{25}u^9 + \cdots + \frac{2}{5}u + \frac{8}{25} \\ u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{18}{25}u^{10} - \frac{3}{25}u^9 + \cdots + \frac{2}{5}u + \frac{8}{25} \\ u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{31}{25}u^{10} - \frac{51}{25}u^9 + \frac{24}{5}u^8 - \frac{201}{25}u^7 + \frac{238}{25}u^6 - \frac{341}{25}u^5 + \frac{47}{5}u^4 - \frac{103}{25}u^3 + \frac{144}{25}u^2 - \frac{6}{5}u + \frac{211}{25}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6 c_9	$u^{11} + 4u^9 + u^8 + 7u^7 + 3u^6 + 4u^5 + 3u^4 + u^3 + u^2 + u - 1$
c_2, c_8	$u^{11} - 6u^{10} + \cdots + 26u - 4$
c_3, c_5	$u^{11} - 2u^9 - 3u^8 + 7u^7 + 3u^6 - 4u^5 - 9u^4 + 5u^3 + 5u^2 - u - 1$
c_7	$u^{11} - 10u^{10} + \cdots + 176u - 32$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_9	$y^{11} + 8y^{10} + \cdots + 3y - 1$
c_2, c_8	$y^{11} + 6y^{10} + \cdots + 124y - 16$
c_3, c_5	$y^{11} - 4y^{10} + \cdots + 11y - 1$
c_7	$y^{11} + 2y^9 + \cdots + 1792y - 1024$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.127465 + 1.057020I$ $a = 0.26477 + 1.83548I$ $b = 0.127465 + 1.057020I$	$-0.55548 + 3.69188I$	$3.27466 - 4.59532I$
$u = 0.127465 - 1.057020I$ $a = 0.26477 - 1.83548I$ $b = 0.127465 - 1.057020I$	$-0.55548 - 3.69188I$	$3.27466 + 4.59532I$
$u = -0.483399 + 0.706724I$ $a = 1.104400 - 0.699054I$ $b = -0.483399 + 0.706724I$	$1.11176 - 2.13095I$	$7.34122 + 2.95650I$
$u = -0.483399 - 0.706724I$ $a = 1.104400 + 0.699054I$ $b = -0.483399 - 0.706724I$	$1.11176 + 2.13095I$	$7.34122 - 2.95650I$
$u = 0.726207 + 0.303425I$ $a = -0.834499 + 0.996603I$ $b = 0.726207 + 0.303425I$	$3.57861 - 2.27941I$	$10.11894 + 1.15857I$
$u = 0.726207 - 0.303425I$ $a = -0.834499 - 0.996603I$ $b = 0.726207 - 0.303425I$	$3.57861 + 2.27941I$	$10.11894 - 1.15857I$
$u = 0.424463 + 1.293840I$ $a = -1.334040 + 0.269858I$ $b = 0.424463 + 1.293840I$	$-6.69869 + 6.38540I$	$0.12486 - 5.46357I$
$u = 0.424463 - 1.293840I$ $a = -1.334040 - 0.269858I$ $b = 0.424463 - 1.293840I$	$-6.69869 - 6.38540I$	$0.12486 + 5.46357I$
$u = -0.56939 + 1.41435I$ $a = 1.081850 + 0.205459I$ $b = -0.56939 + 1.41435I$	$-3.64137 - 12.81030I$	$2.99547 + 7.42806I$
$u = -0.56939 - 1.41435I$ $a = 1.081850 - 0.205459I$ $b = -0.56939 - 1.41435I$	$-3.64137 + 12.81030I$	$2.99547 - 7.42806I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.450687$ $a = \quad 1.43503$ $b = -0.450687$	0.895812	11.2900

II.
$\boldsymbol{I_2^u = \langle -6.33\times 10^{7}u^{19} - 1.96\times 10^{8}u^{18} + \cdots + 5.99\times 10^{8}b - 2.59\times 10^{8},\ -1.03\times 10^{8}u^{19} - 1.39\times 10^{8}u^{18} + \cdots + 7.23\times 10^{8}a - 1.81\times 10^{9},\ u^{20} + u^{19} + \cdots - 8u + 7\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.141704u^{19} + 0.192210u^{18} + \cdots - 2.03306u + 2.49544 \\ 0.105556u^{19} + 0.326606u^{18} + \cdots + 1.69754u + 0.432891 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.247259u^{19} + 0.518817u^{18} + \cdots - 0.335520u + 2.92833 \\ 0.105556u^{19} + 0.326606u^{18} + \cdots + 1.69754u + 0.432891 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.284561u^{19} + 0.335067u^{18} + \cdots + 3.39551u + 1.35258 \\ 0.164678u^{19} + 0.105389u^{18} + \cdots + 3.03699u - 1.41642 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.149091u^{19} + 0.564154u^{18} + \cdots - 4.13459u + 4.66739 \\ 0.109222u^{19} + 0.420500u^{18} + \cdots + 0.934319u + 0.812840 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.349552u^{19} - 0.0796380u^{18} + \cdots - 1.25873u + 1.73518 \\ -0.551898u^{19} - 0.446663u^{18} + \cdots - 6.28274u + 0.316957 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.349552u^{19} - 0.0796380u^{18} + \cdots - 1.25873u + 1.73518 \\ -0.551898u^{19} - 0.446663u^{18} + \cdots - 6.28274u + 0.316957 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{1402773924}{2996962805}u^{19} - \frac{100220208}{2996962805}u^{18} + \cdots - \frac{22381283924}{2996962805}u + \frac{26005127826}{2996962805}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_9	$y^{20} + 15y^{19} + \cdots + 468y + 49$
c_2, c_8	$(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)^4$
c_3, c_5	$y^{20} + 3y^{19} + \cdots + 12y + 1$
c_7	$(y^2 + y + 1)^{10}$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.590252 + 0.825819I$ $a = 0.407671 - 0.896841I$ $b = 0.070663 + 0.512466I$	$0.93776 - 2.37095I$	$4.74431 + 0.03448I$
$u = -0.590252 - 0.825819I$ $a = 0.407671 + 0.896841I$ $b = 0.070663 - 0.512466I$	$0.93776 + 2.37095I$	$4.74431 - 0.03448I$
$u = 0.067213 + 1.072300I$ $a = 0.833585 - 0.414037I$ $b = -0.38849 - 1.61565I$	$-4.60570 + 0.49930I$	$0.515115 + 0.966547I$
$u = 0.067213 - 1.072300I$ $a = 0.833585 + 0.414037I$ $b = -0.38849 + 1.61565I$	$-4.60570 - 0.49930I$	$0.515115 - 0.966547I$
$u = -0.130820 + 1.153330I$ $a = -0.789899 - 0.343929I$ $b = 0.739688 - 0.098744I$	$-2.53372 - 2.02988I$	$1.48114 + 3.46410I$
$u = -0.130820 - 1.153330I$ $a = -0.789899 + 0.343929I$ $b = 0.739688 + 0.098744I$	$-2.53372 + 2.02988I$	$1.48114 - 3.46410I$
$u = 0.387179 + 1.147990I$ $a = 0.809229 - 0.162618I$ $b = -1.286370 - 0.028870I$	$0.93776 + 6.43072I$	$4.74431 - 6.96269I$
$u = 0.387179 - 1.147990I$ $a = 0.809229 + 0.162618I$ $b = -1.286370 + 0.028870I$	$0.93776 - 6.43072I$	$4.74431 + 6.96269I$
$u = 0.739688 + 0.098744I$ $a = 0.817684 + 1.061640I$ $b = -0.130820 - 1.153330I$	$-2.53372 + 2.02988I$	$1.48114 - 3.46410I$
$u = 0.739688 - 0.098744I$ $a = 0.817684 - 1.061640I$ $b = -0.130820 + 1.153330I$	$-2.53372 - 2.02988I$	$1.48114 + 3.46410I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.286370 + 0.028870I$ $a = -0.403596 + 0.664172I$ $b = 0.387179 - 1.147990I$	$0.93776 - 6.43072I$	$4.74431 + 6.96269I$
$u = -1.286370 - 0.028870I$ $a = -0.403596 - 0.664172I$ $b = 0.387179 + 1.147990I$	$0.93776 + 6.43072I$	$4.74431 - 6.96269I$
$u = -0.133857 + 1.341630I$ $a = -0.675959 - 0.305240I$ $b = 0.76505 - 1.34819I$	$-4.60570 - 3.56046I$	$0.51511 + 7.89475I$
$u = -0.133857 - 1.341630I$ $a = -0.675959 + 0.305240I$ $b = 0.76505 + 1.34819I$	$-4.60570 + 3.56046I$	$0.51511 - 7.89475I$
$u = 0.070663 + 0.512466I$ $a = 1.79041 - 0.72880I$ $b = -0.590252 + 0.825819I$	$0.93776 - 2.37095I$	$4.74431 + 0.03448I$
$u = 0.070663 - 0.512466I$ $a = 1.79041 + 0.72880I$ $b = -0.590252 - 0.825819I$	$0.93776 + 2.37095I$	$4.74431 - 0.03448I$
$u = 0.76505 + 1.34819I$ $a = 0.645088 - 0.004802I$ $b = -0.133857 - 1.341630I$	$-4.60570 + 3.56046I$	$0.51511 - 7.89475I$
$u = 0.76505 - 1.34819I$ $a = 0.645088 + 0.004802I$ $b = -0.133857 + 1.341630I$	$-4.60570 - 3.56046I$	$0.51511 + 7.89475I$
$u = -0.38849 + 1.61565I$ $a = -0.577071 - 0.170713I$ $b = 0.067213 - 1.072300I$	$-4.60570 - 0.49930I$	$0.515115 - 0.966547I$
$u = -0.38849 - 1.61565I$ $a = -0.577071 + 0.170713I$ $b = 0.067213 + 1.072300I$	$-4.60570 + 0.49930I$	$0.515115 + 0.966547I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -7u^3 - 2u^2 - 11u + 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_9	$y^4 + 4y^3 + 6y^2 + 3y + 1$
c_2, c_8	$y^4 + 3y^3 + 6y^2 + 4y + 1$
c_3, c_5	$y^4 + 2y^2 - y + 1$
c_7	$y^4 - y^3 + 2y^2 + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.343815 + 0.625358I$ $a = 0.05204 + 1.65794I$ $b = -0.343815 - 0.625358I$	$1.13814 + 3.38562I$	$7.30286 - 7.57942I$
$u = 0.343815 - 0.625358I$ $a = 0.05204 - 1.65794I$ $b = -0.343815 + 0.625358I$	$1.13814 - 3.38562I$	$7.30286 + 7.57942I$
$u = -0.343815 + 1.358440I$ $a = -0.552038 - 0.242275I$ $b = 0.343815 - 1.358440I$	$-4.42801 - 2.37936I$	$2.19714 + 1.10073I$
$u = -0.343815 - 1.358440I$ $a = -0.552038 + 0.242275I$ $b = 0.343815 + 1.358440I$	$-4.42801 + 2.37936I$	$2.19714 - 1.10073I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4	(u^4+2u^2-u+1) $\cdot(u^{11}+4u^9+u^8+7u^7+3u^6+4u^5+3u^4+u^3+u^2+u-1)$ $\cdot(u^{20}-u^{19}+\cdots+8u+7)$
c_2	$(u^4+u^3+2u^2+1)(u^5+u^4+2u^3+u^2+u+1)^4$ $\cdot(u^{11}-6u^{10}+\cdots+26u-4)$
c_3, c_5	$(u^4+u+1)(u^{11}-2u^9+\cdots-u-1)$ $\cdot(u^{20}+5u^{19}+\cdots+2u+1)$
c_6, c_9	(u^4+2u^2+u+1) $\cdot(u^{11}+4u^9+u^8+7u^7+3u^6+4u^5+3u^4+u^3+u^2+u-1)$ $\cdot(u^{20}-u^{19}+\cdots+8u+7)$
c_7	$((u^2+u+1)^{10})(u^4-u^3+1)(u^{11}-10u^{10}+\cdots+176u-32)$
c_8	$(u^4-u^3+2u^2+1)(u^5+u^4+2u^3+u^2+u+1)^4$ $\cdot(u^{11}-6u^{10}+\cdots+26u-4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_9	$(y^4 + 4y^3 + 6y^2 + 3y + 1)(y^{11} + 8y^{10} + \cdots + 3y - 1)$ $\cdot (y^{20} + 15y^{19} + \cdots + 468y + 49)$
c_2, c_8	$(y^4 + 3y^3 + 6y^2 + 4y + 1)(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)^4$ $\cdot (y^{11} + 6y^{10} + \cdots + 124y - 16)$
c_3, c_5	$(y^4 + 2y^2 - y + 1)(y^{11} - 4y^{10} + \cdots + 11y - 1)$ $\cdot (y^{20} + 3y^{19} + \cdots + 12y + 1)$
c_7	$((y^2 + y + 1)^{10})(y^4 - y^3 + 2y^2 + 1)(y^{11} + 2y^9 + \cdots + 1792y - 1024)$