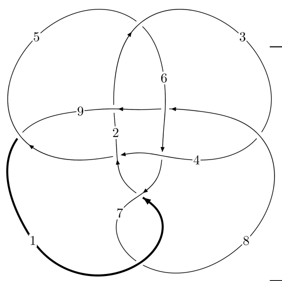
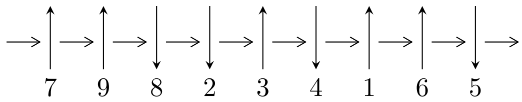
9_{34} $(K9a_{28})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -61u^{16} - 298u^{15} + \cdots + 43b + 351,\ -107u^{16} - 319u^{15} + \cdots + 172a - 257,$$
$$u^{17} + 5u^{16} + \cdots - 21u - 4\rangle$$
$$I_2^u = \langle u^{10}a - 2u^9a + \cdots + a - 1,\ -u^9a - u^{10} + \cdots + a^2 + 1,$$
$$u^{11} - 3u^{10} + 8u^9 - 13u^8 + 18u^7 - 20u^6 + 18u^5 - 15u^4 + 9u^3 - 5u^2 + 2u - 1\rangle$$
$$I_3^u = \langle -u^3 + 2u^2 + b - 2u + 1,\ u^4 - u^3 + a + u - 2,\ u^5 - 2u^4 + 3u^3 - 3u^2 + u - 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 44 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. $\boldsymbol{I_1^u = \langle -61u^{16} - 298u^{15} + \cdots + 43b + 351,\ -107u^{16} - 319u^{15} + \cdots + 172a - 257,\ u^{17} + 5u^{16} + \cdots - 21u - 4\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} 0.622093u^{16} + 1.85465u^{15} + \cdots + 5.02907u + 1.49419 \\ 1.41860u^{16} + 6.93023u^{15} + \cdots - 36.1860u - 8.16279 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 2.04070u^{16} + 8.78488u^{15} + \cdots - 31.1570u - 6.66860 \\ 1.41860u^{16} + 6.93023u^{15} + \cdots - 36.1860u - 8.16279 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.901163u^{16} + 3.80814u^{15} + \cdots - 14.7616u - 2.94767 \\ 0.720930u^{16} + 3.04651u^{15} + \cdots - 9.20930u - 1.55814 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -3.56395u^{16} - 14.4477u^{15} + \cdots + 49.8895u + 13.1221 \\ -3.37209u^{16} - 15.6047u^{15} + \cdots + 62.7209u + 14.2558 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.843023u^{16} - 4.40116u^{15} + \cdots + 26.6802u + 7.56395 \\ -0.604651u^{16} - 2.23256u^{15} + \cdots + 18.0465u + 5.79070 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.843023u^{16} - 4.40116u^{15} + \cdots + 26.6802u + 7.56395 \\ -0.604651u^{16} - 2.23256u^{15} + \cdots + 18.0465u + 5.79070 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{441}{43}u^{16} + \frac{1969}{43}u^{15} + \cdots - \frac{7549}{43}u - \frac{2042}{43}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$u^{17} + 5u^{16} + \cdots - 21u - 4$
c_2, c_8	$u^{17} + u^{16} + \cdots - u - 1$
c_3, c_9	$u^{17} + 5u^{13} + \cdots + 4u - 1$
c_4, c_6	$u^{17} + 2u^{16} + \cdots + 8u - 1$
c_5	$u^{17} + 10u^{16} + \cdots + 5u + 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$y^{17} + 9y^{16} + \cdots + 17y - 16$
c_2, c_8	$y^{17} + 7y^{16} + \cdots - 19y - 1$
c_3, c_9	$y^{17} + 10y^{15} + \cdots + 10y - 1$
c_4, c_6	$y^{17} - 12y^{16} + \cdots + 46y - 1$
c_5	$y^{17} + 16y^{15} + \cdots - 11y - 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.048681 + 1.008070I$ $a = -1.66750 + 0.61626I$ $b = 1.134670 + 0.483593I$	$-3.35770 + 0.12402I$	$-5.97884 + 0.38118I$
$u = 0.048681 - 1.008070I$ $a = -1.66750 - 0.61626I$ $b = 1.134670 - 0.483593I$	$-3.35770 - 0.12402I$	$-5.97884 - 0.38118I$
$u = 0.423210 + 0.769632I$ $a = 0.879104 + 0.306597I$ $b = -0.311039 - 0.398365I$	$0.28619 + 1.83578I$	$2.59246 - 3.36751I$
$u = 0.423210 - 0.769632I$ $a = 0.879104 - 0.306597I$ $b = -0.311039 + 0.398365I$	$0.28619 - 1.83578I$	$2.59246 + 3.36751I$
$u = -1.115480 + 0.170377I$ $a = 0.027795 - 0.216323I$ $b = -0.973543 + 0.694225I$	$0.27750 + 8.29795I$	$1.06571 - 6.88359I$
$u = -1.115480 - 0.170377I$ $a = 0.027795 + 0.216323I$ $b = -0.973543 - 0.694225I$	$0.27750 - 8.29795I$	$1.06571 + 6.88359I$
$u = 1.18539$ $a = 0.285468$ $b = -0.154842$	2.39123	15.5890
$u = -0.546851 + 1.063670I$ $a = -0.818209 + 0.890659I$ $b = 1.249560 + 0.062335I$	$-3.79067 - 2.00597I$	$-6.21078 + 1.26630I$
$u = -0.546851 - 1.063670I$ $a = -0.818209 - 0.890659I$ $b = 1.249560 - 0.062335I$	$-3.79067 + 2.00597I$	$-6.21078 - 1.26630I$
$u = -0.437546 + 1.154220I$ $a = -1.81788 + 0.29672I$ $b = 1.40541 + 1.07727I$	$-4.31147 - 5.61068I$	$-7.96642 + 8.06049I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.437546 - 1.154220I$ $a = -1.81788 - 0.29672I$ $b = 1.40541 - 1.07727I$	$-4.31147 + 5.61068I$	$-7.96642 - 8.06049I$
$u = -0.582313 + 0.090917I$ $a = 0.732188 - 0.199615I$ $b = 0.842156 - 0.620975I$	$-1.32135 + 1.62186I$	$-2.58195 - 4.11393I$
$u = -0.582313 - 0.090917I$ $a = 0.732188 + 0.199615I$ $b = 0.842156 + 0.620975I$	$-1.32135 - 1.62186I$	$-2.58195 + 4.11393I$
$u = -0.59542 + 1.30831I$ $a = 1.58913 - 0.22054I$ $b = -1.40015 - 0.93567I$	$-3.3114 - 14.3446I$	$-1.18187 + 8.40363I$
$u = -0.59542 - 1.30831I$ $a = 1.58913 + 0.22054I$ $b = -1.40015 + 0.93567I$	$-3.3114 + 14.3446I$	$-1.18187 - 8.40363I$
$u = -0.28698 + 1.44004I$ $a = 0.807648 - 0.511056I$ $b = -0.869639 - 0.080492I$	$-5.40594 + 3.12036I$	$-5.53287 - 3.71986I$
$u = -0.28698 - 1.44004I$ $a = 0.807648 + 0.511056I$ $b = -0.869639 + 0.080492I$	$-5.40594 - 3.12036I$	$-5.53287 + 3.71986I$

II.

$\boldsymbol{I_2^u = \langle u^{10}a-2u^9a+\cdots+a-1,\ -u^9a-u^{10}+\cdots+a^2+1,\ u^{11}-3u^{10}+\cdots+2u-1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} a \\ -u^{10}a+2u^9a+\cdots-a+1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u \\ u^3+u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{10}a+2u^9a+\cdots-2u+1 \\ -u^{10}a+2u^9a+\cdots-a+1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^9-2u^8+4u^7-3u^6+u^5+u^3a+u^4-4u^3+au+2u^2+a-3u+1 \\ u^{10}a-2u^9a+\cdots+a+1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^9a+u^9+\cdots-a+2 \\ 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^9-4u^8+\cdots+a-1 \\ -u^{10}a+2u^9a+\cdots-a+1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^9-4u^8+\cdots+a-1 \\ -u^{10}a+2u^9a+\cdots-a+1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^{10}-4u^9+8u^8+4u^7-8u^6+12u^5-12u^4+4u^3-8u^2+2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_7	$(u^{11} - 3u^{10} + \cdots + 2u - 1)^2$
c_2, c_8	$u^{22} + 3u^{21} + \cdots + 6u + 1$
c_3, c_9	$u^{22} + u^{21} + \cdots - 10u + 1$
c_4, c_6	$u^{22} - u^{21} + \cdots - 4u + 1$
c_5	$(u^{11} - 5u^{10} + 12u^9 - 15u^8 + 8u^7 + 4u^6 - 8u^5 + 3u^4 + 3u^3 - 3u^2 + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_7	$(y^{11} + 7y^{10} + \cdots - 6y - 1)^2$
c_2, c_8	$y^{22} - 5y^{21} + \cdots + 72y^2 + 1$
c_3, c_9	$y^{22} - y^{21} + \cdots - 8y + 1$
c_4, c_6	$y^{22} + 3y^{21} + \cdots + 8y + 1$
c_5	$(y^{11} - y^{10} + \cdots + 6y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.253759 + 0.946686I$ $a = -0.049055 - 1.213920I$ $b = -0.33551 + 1.93421I$	$-0.13765 - 5.21629I$	$0.43603 + 9.01278I$
$u = -0.253759 + 0.946686I$ $a = -2.57911 - 0.36655I$ $b = 0.584301 + 0.546847I$	$-0.13765 - 5.21629I$	$0.43603 + 9.01278I$
$u = -0.253759 - 0.946686I$ $a = -0.049055 + 1.213920I$ $b = -0.33551 - 1.93421I$	$-0.13765 + 5.21629I$	$0.43603 - 9.01278I$
$u = -0.253759 - 0.946686I$ $a = -2.57911 + 0.36655I$ $b = 0.584301 - 0.546847I$	$-0.13765 + 5.21629I$	$0.43603 - 9.01278I$
$u = 1.10821$ $a = 0.305204 + 0.028042I$ $b = -0.160435 - 0.287182I$	2.37876	12.2610
$u = 1.10821$ $a = 0.305204 - 0.028042I$ $b = -0.160435 + 0.287182I$	2.37876	12.2610
$u = 0.572881 + 0.536287I$ $a = 0.605018 - 0.138715I$ $b = 0.379406 - 0.599968I$	$0.42400 + 2.24779I$	$3.63582 - 5.06360I$
$u = 0.572881 + 0.536287I$ $a = 1.12964 + 0.99333I$ $b = -0.960104 - 0.104756I$	$0.42400 + 2.24779I$	$3.63582 - 5.06360I$
$u = 0.572881 - 0.536287I$ $a = 0.605018 + 0.138715I$ $b = 0.379406 + 0.599968I$	$0.42400 - 2.24779I$	$3.63582 + 5.06360I$
$u = 0.572881 - 0.536287I$ $a = 1.12964 - 0.99333I$ $b = -0.960104 + 0.104756I$	$0.42400 - 2.24779I$	$3.63582 + 5.06360I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.290349 + 1.272230I$ $a = 1.21435 + 0.88581I$ $b = -0.734695 + 0.377618I$	$-4.63073 + 5.00074I$	$-7.84059 - 6.22751I$
$u = 0.290349 + 1.272230I$ $a = -1.62496 + 0.36379I$ $b = 1.46811 - 0.97707I$	$-4.63073 + 5.00074I$	$-7.84059 - 6.22751I$
$u = 0.290349 - 1.272230I$ $a = 1.21435 - 0.88581I$ $b = -0.734695 - 0.377618I$	$-4.63073 - 5.00074I$	$-7.84059 + 6.22751I$
$u = 0.290349 - 1.272230I$ $a = -1.62496 - 0.36379I$ $b = 1.46811 + 0.97707I$	$-4.63073 - 5.00074I$	$-7.84059 + 6.22751I$
$u = -0.234018 + 0.605151I$ $a = 0.357585 - 0.648167I$ $b = 0.378854 - 1.068730I$	$0.80290 + 2.70441I$	$3.46762 + 0.08333I$
$u = -0.234018 + 0.605151I$ $a = 2.61356 + 0.79794I$ $b = -0.866642 - 0.847442I$	$0.80290 + 2.70441I$	$3.46762 + 0.08333I$
$u = -0.234018 - 0.605151I$ $a = 0.357585 + 0.648167I$ $b = 0.378854 + 1.068730I$	$0.80290 - 2.70441I$	$3.46762 - 0.08333I$
$u = -0.234018 - 0.605151I$ $a = 2.61356 - 0.79794I$ $b = -0.866642 + 0.847442I$	$0.80290 - 2.70441I$	$3.46762 - 0.08333I$
$u = 0.57044 + 1.34258I$ $a = -0.862107 + 0.035474I$ $b = 0.818255 - 0.852218I$	$-1.76023 + 5.92443I$	$3.17045 - 10.02355I$
$u = 0.57044 + 1.34258I$ $a = 1.389870 + 0.219943I$ $b = -1.071530 + 0.524779I$	$-1.76023 + 5.92443I$	$3.17045 - 10.02355I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.57044 - 1.34258I$ $a = -0.862107 - 0.035474I$ $b = 0.818255 + 0.852218I$	$-1.76023 - 5.92443I$	$3.17045 + 10.02355I$
$u = 0.57044 - 1.34258I$ $a = 1.389870 - 0.219943I$ $b = -1.071530 - 0.524779I$	$-1.76023 - 5.92443I$	$3.17045 + 10.02355I$

III.

$$\boldsymbol{I_3^u = \langle -u^3+2u^2+b-2u+1,\ u^4-u^3+a+u-2,\ u^5-2u^4+3u^3-3u^2+u-1\rangle}$$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

$$a_8 = \begin{pmatrix} u \\ u^3+u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^4+2u^3-2u^2+u+1 \\ u^3-2u^2+2u-1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^4+u^3-u^2+2 \\ -u^4+2u^3-3u^2+2u-1 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} u^4-2u^3+3u^2-2u \\ u^2-u+1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^4-2u^3+3u^2-2u \\ u^2-u+1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6u^4+13u^3-22u^2+14u-9$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.372466 + 1.263920I$ $a = -1.347300 - 0.010044I$ $b = 0.929085 - 0.848284I$	$-3.01018 + 5.17259I$	$-1.67537 - 5.94701I$
$u = 0.372466 - 1.263920I$ $a = -1.347300 + 0.010044I$ $b = 0.929085 + 0.848284I$	$-3.01018 - 5.17259I$	$-1.67537 + 5.94701I$
$u = 1.33263$ $a = -0.119827$ $b = 0.480071$	2.14584	-17.5700
$u = -0.038780 + 0.656277I$ $a = 1.90721 - 0.97967I$ $b = -0.169121 + 1.134660I$	$0.29233 - 3.70382I$	$-0.53969 + 6.40947I$
$u = -0.038780 - 0.656277I$ $a = 1.90721 + 0.97967I$ $b = -0.169121 - 1.134660I$	$0.29233 + 3.70382I$	$-0.53969 - 6.40947I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^5-2u^4+3u^3-3u^2+u-1)(u^{11}-3u^{10}+\cdots+2u-1)^2$ $\cdot(u^{17}+5u^{16}+\cdots-21u-4)$
c_2, c_8	$(u^5-u^4-u^3+u^2-1)(u^{17}+u^{16}+\cdots-u-1)(u^{22}+3u^{21}+\cdots+6u+1)$
c_3, c_9	$(u^5-u^3+u^2+u-1)(u^{17}+5u^{13}+\cdots+4u-1)$ $\cdot(u^{22}+u^{21}+\cdots-10u+1)$
c_4, c_6	$(u^5+2u^4+3u^3+3u^2+3u+1)(u^{17}+2u^{16}+\cdots+8u-1)$ $\cdot(u^{22}-u^{21}+\cdots-4u+1)$
c_5	$(u^5-3u^4+5u^3-4u^2+3u-1)$ $\cdot(u^{11}-5u^{10}+12u^9-15u^8+8u^7+4u^6-8u^5+3u^4+3u^3-3u^2+1)^2$ $\cdot(u^{17}+10u^{16}+\cdots+5u+2)$
c_7	$(u^5+2u^4+3u^3+3u^2+u+1)(u^{11}-3u^{10}+\cdots+2u-1)^2$ $\cdot(u^{17}+5u^{16}+\cdots-21u-4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_7	$(y^5 + 2y^4 - y^3 - 7y^2 - 5y - 1)(y^{11} + 7y^{10} + \cdots - 6y - 1)^2$ $\cdot (y^{17} + 9y^{16} + \cdots + 17y - 16)$
c_2, c_8	$(y^5 - 3y^4 + 3y^3 - 3y^2 + 2y - 1)(y^{17} + 7y^{16} + \cdots - 19y - 1)$ $\cdot (y^{22} - 5y^{21} + \cdots + 72y^2 + 1)$
c_3, c_9	$(y^5 - 2y^4 + 3y^3 - 3y^2 + 3y - 1)(y^{17} + 10y^{15} + \cdots + 10y - 1)$ $\cdot (y^{22} - y^{21} + \cdots - 8y + 1)$
c_4, c_6	$(y^5 + 2y^4 + 3y^3 + 5y^2 + 3y - 1)(y^{17} - 12y^{16} + \cdots + 46y - 1)$ $\cdot (y^{22} + 3y^{21} + \cdots + 8y + 1)$
c_5	$(y^5 + y^4 + 7y^3 + 8y^2 + y - 1)(y^{11} - y^{10} + \cdots + 6y - 1)^2$ $\cdot (y^{17} + 16y^{15} + \cdots - 11y - 4)$