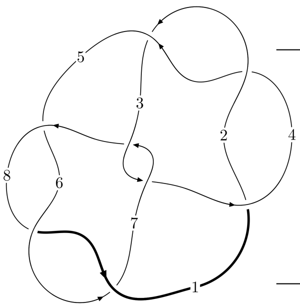
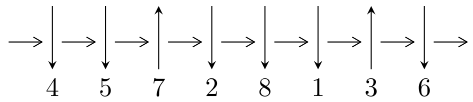
8_5 $(K8a_{13})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle b + u,\ u^4 + u^3 - 2u^2 + a - 2u,\ u^5 + u^4 - 3u^3 - 2u^2 + 2u - 1\rangle$$
$$I_2^u = \langle -u^5 + 2u^3 - u^2 + b - u + 1,\ -u^4 + u^2 + a - u + 1,\ u^6 + u^5 - 2u^4 + 2u^2 - 2u - 1\rangle$$
$$I_3^u = \langle b + 1,\ a,\ u - 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 12 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. $\boldsymbol{I_1^u = \langle b+u,\ u^4+u^3-2u^2+a-2u,\ u^5+u^4-3u^3-2u^2+2u-1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2u^4-6u^3+4u^2+14u-10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_6, c_8	$y^5 - 7y^4 + 17y^3 - 14y^2 - 1$
c_3, c_7	$y^5 + 3y^4 + 2y^3 - 13y^2 - 12y - 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.331409 + 0.386277I$ $a = 0.76001 + 1.23514I$ $b = -0.331409 - 0.386277I$	$-0.373181 - 1.138820I$	$-4.71808 + 6.05450I$
$u = 0.331409 - 0.386277I$ $a = 0.76001 - 1.23514I$ $b = -0.331409 + 0.386277I$	$-0.373181 + 1.138820I$	$-4.71808 - 6.05450I$
$u = 1.49784$ $a = -0.911163$ $b = -1.49784$	-8.51482	-10.2860
$u = -1.58033 + 0.28256I$ $a = 0.195567 + 1.002700I$ $b = 1.58033 - 0.28256I$	$-13.4637 + 6.9972I$	$-11.13904 - 3.54683I$
$u = -1.58033 - 0.28256I$ $a = 0.195567 - 1.002700I$ $b = 1.58033 + 0.28256I$	$-13.4637 - 6.9972I$	$-11.13904 + 3.54683I$

II.

$\boldsymbol{I^u_2 = \langle -u^5+2u^3-u^2+b-u+1,\ -u^4+u^2+a-u+1,\ u^6+u^5-2u^4+2u^2-2u-1 \rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u^4-u^2+u-1 \\ u^5-2u^3+u^2+u-1 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} u^5+u^4-2u^3+2u-2 \\ u^5-2u^3+u^2+u-1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^5-2u^3+2u^2+u-2 \\ u^5-u^3+2u^2-u-2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4 c_5, c_6, c_8	$u^6 - u^5 - 2u^4 + 2u^2 + 2u - 1$
c_3, c_7	$(u^3 + u^2 + 2u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_6, c_8	$y^6 - 5y^5 + 8y^4 - 6y^3 + 8y^2 - 8y + 1$
c_3, c_7	$(y^3 + 3y^2 + 2y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.592989 + 0.847544I$ $a = -0.916215 - 0.894804I$ $b = 1.47043 + 0.10268I$	$-6.31400 - 2.82812I$	$-9.50976 + 2.97945I$
$u = 0.592989 - 0.847544I$ $a = -0.916215 + 0.894804I$ $b = 1.47043 - 0.10268I$	$-6.31400 + 2.82812I$	$-9.50976 - 2.97945I$
$u = 1.13416$ $a = 0.502436$ $b = 0.379278$	-2.17641	-2.98050
$u = -1.47043 + 0.10268I$ $a = -0.083785 - 0.894804I$ $b = -0.592989 + 0.847544I$	$-6.31400 + 2.82812I$	$-9.50976 - 2.97945I$
$u = -1.47043 - 0.10268I$ $a = -0.083785 + 0.894804I$ $b = -0.592989 - 0.847544I$	$-6.31400 - 2.82812I$	$-9.50976 + 2.97945I$
$u = -0.379278$ $a = -1.50244$ $b = -1.13416$	-2.17641	-2.98050

III. $I_3^u = \langle b+1,\ a,\ u-1 \rangle$

(i) Arc colorings

$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

$a_4 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

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

$a_5 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$

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

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

$a_6 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$

$a_8 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5 c_6	$u - 1$
c_3, c_7	u
c_4, c_8	$u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_6, c_8	$y - 1$
c_3, c_7	y

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0$ $b = -1.00000$	-3.28987	-12.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5 c_6	$(u-1)(u^5-u^4+\cdots+2u+1)(u^6-u^5+\cdots+2u-1)$
c_3, c_7	$u(u^3+u^2+2u+1)^2(u^5-3u^4+6u^3-7u^2+4u-2)$
c_4, c_8	$(u+1)(u^5-u^4+\cdots+2u+1)(u^6-u^5+\cdots+2u-1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_6, c_8	$(y-1)(y^5 - 7y^4 + \cdots - 14y^2 - 1)(y^6 - 5y^5 + \cdots - 8y + 1)$
c_3, c_7	$y(y^3 + 3y^2 + 2y - 1)^2(y^5 + 3y^4 + 2y^3 - 13y^2 - 12y - 4)$