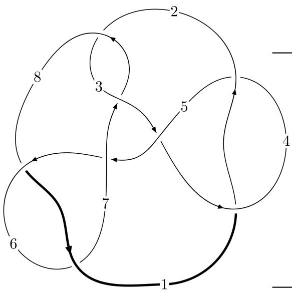
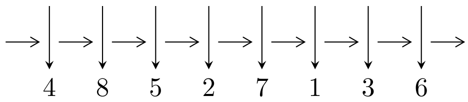
8_{15} $(K8a_2)$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^6 - 2u^5 + 3u^4 - 2u^3 + b + u - 1,\ -u^6 + 3u^5 - 4u^4 + 3u^3 - u^2 + 2a - u,$$
$$u^7 - 3u^6 + 6u^5 - 7u^4 + 5u^3 - u^2 - 2u + 2\rangle$$
$$I_2^u = \langle u^4a + u^2a + u^3 - au + b + a + u - 1,\ -u^3a - 2u^2a + u^3 + a^2 - 2au + u^2 - 2a + u + 1,$$
$$u^5 + u^4 + 2u^3 + u^2 + u + 1\rangle$$

$$I_1^v = \langle a,\ b - 1,\ v + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 18 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. $\boldsymbol{I_1^u = \langle u^6 - 2u^5 + 3u^4 - 2u^3 + b + u - 1,\ -u^6 + 3u^5 - 4u^4 + 3u^3 - u^2 + 2a - u,\ u^7 - 3u^6 + 6u^5 - 7u^4 + 5u^3 - u^2 - 2u + 2\rangle}$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} \frac{1}{2}u^6 - \frac{3}{2}u^5 + \cdots + \frac{1}{2}u^2 + \frac{1}{2}u \\ -u^6 + 2u^5 - 3u^4 + 2u^3 - u + 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{2}u^6 + \frac{1}{2}u^5 + \cdots - \frac{1}{2}u + 1 \\ -u^6 + 2u^5 - 3u^4 + 2u^3 - u + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u^6 - \frac{3}{2}u^5 + \cdots + \frac{1}{2}u - 1 \\ u^4 - u^3 + u^2 - 1 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} \frac{1}{2}u^6 - \frac{1}{2}u^5 + \cdots + \frac{1}{2}u^2 - \frac{1}{2}u \\ u^6 - 2u^5 + 3u^4 - 3u^3 + u^2 - 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6 c_8	$u^7 - u^6 - u^5 + 2u^4 + u^3 - 2u^2 + u + 1$
c_2, c_7	$u^7 - 3u^6 + 6u^5 - 7u^4 + 5u^3 - u^2 - 2u + 2$
c_3, c_5	$u^7 + 3u^6 + 7u^5 + 8u^4 + 9u^3 + 6u^2 + 5u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_8	$y^7 - 3y^6 + 7y^5 - 8y^4 + 9y^3 - 6y^2 + 5y - 1$
c_2, c_7	$y^7 + 3y^6 + 4y^5 + y^4 - y^3 + 7y^2 + 8y - 4$
c_3, c_5	$y^7 + 5y^6 + 19y^5 + 36y^4 + 49y^3 + 38y^2 + 13y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.984140 + 0.426152I$ $a = 0.472917 + 0.120643I$ $b = 0.985336 - 0.506466I$	$-2.09542 + 3.93070I$	$-10.25941 - 4.87230I$
$u = 0.984140 - 0.426152I$ $a = 0.472917 - 0.120643I$ $b = 0.985336 + 0.506466I$	$-2.09542 - 3.93070I$	$-10.25941 + 4.87230I$
$u = 0.167785 + 1.218780I$ $a = 0.529166 - 1.016880I$ $b = -0.597306 + 0.773845I$	$3.85236 + 0.95540I$	$-3.31071 - 2.37083I$
$u = 0.167785 - 1.218780I$ $a = 0.529166 + 1.016880I$ $b = -0.597306 - 0.773845I$	$3.85236 - 0.95540I$	$-3.31071 + 2.37083I$
$u = 0.654547 + 1.202470I$ $a = -0.33478 + 1.51279I$ $b = -1.139460 - 0.630170I$	$0.36369 - 9.93065I$	$-8.46028 + 7.33664I$
$u = 0.654547 - 1.202470I$ $a = -0.33478 - 1.51279I$ $b = -1.139460 + 0.630170I$	$0.36369 + 9.93065I$	$-8.46028 - 7.33664I$
$u = -0.612945$ $a = 0.665400$ $b = 0.502855$	-0.951399	-9.93920

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_8	$y^{10} - 5y^9 + \cdots - 4y + 1$
c_2, c_7	$(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)^2$
c_3, c_5	$y^{10} - y^9 - 6y^7 + 22y^6 + 6y^5 + 45y^4 + 15y^3 + 22y^2 + 4y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.339110 + 0.822375I$ $a = 0.445032 + 0.031192I$ $b = 1.236040 - 0.156723I$	$-2.96077 - 1.53058I$	$-9.48489 + 4.43065I$
$u = 0.339110 + 0.822375I$ $a = 0.46155 + 2.45660I$ $b = -0.926127 - 0.393188I$	$-2.96077 - 1.53058I$	$-9.48489 + 4.43065I$
$u = 0.339110 - 0.822375I$ $a = 0.445032 - 0.031192I$ $b = 1.236040 + 0.156723I$	$-2.96077 + 1.53058I$	$-9.48489 - 4.43065I$
$u = 0.339110 - 0.822375I$ $a = 0.46155 - 2.45660I$ $b = -0.926127 + 0.393188I$	$-2.96077 + 1.53058I$	$-9.48489 - 4.43065I$
$u = -0.766826$ $a = 0.595741 + 0.124010I$ $b = 0.608868 - 0.334904I$	-0.888787	-8.51890
$u = -0.766826$ $a = 0.595741 - 0.124010I$ $b = 0.608868 + 0.334904I$	-0.888787	-8.51890
$u = -0.455697 + 1.200150I$ $a = 0.542114 + 0.781069I$ $b = -0.400287 - 0.864056I$	$2.58269 + 4.40083I$	$-5.25569 - 3.49859I$
$u = -0.455697 + 1.200150I$ $a = -0.04444 - 1.54938I$ $b = -1.018500 + 0.644891I$	$2.58269 + 4.40083I$	$-5.25569 - 3.49859I$
$u = -0.455697 - 1.200150I$ $a = 0.542114 - 0.781069I$ $b = -0.400287 + 0.864056I$	$2.58269 - 4.40083I$	$-5.25569 + 3.49859I$
$u = -0.455697 - 1.200150I$ $a = -0.04444 + 1.54938I$ $b = -1.018500 - 0.644891I$	$2.58269 - 4.40083I$	$-5.25569 + 3.49859I$

III. $I_1^v = \langle a,\ b-1,\ v+1 \rangle$

(i) Arc colorings

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

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

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

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

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$v = -1.00000$ $a = 0$ $b = 1.00000$	-3.28987	-12.0000

IV. u-Polynomials

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

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_8	$(y-1)(y^7 - 3y^6 + 7y^5 - 8y^4 + 9y^3 - 6y^2 + 5y - 1)$ $\cdot (y^{10} - 5y^9 + \cdots - 4y + 1)$
c_2, c_7	$y(y^5 + 3y^4 + 4y^3 + y^2 - y - 1)^2$ $\cdot (y^7 + 3y^6 + 4y^5 + y^4 - y^3 + 7y^2 + 8y - 4)$
c_3, c_5	$(y-1)(y^7 + 5y^6 + 19y^5 + 36y^4 + 49y^3 + 38y^2 + 13y - 1)$ $\cdot (y^{10} - y^9 - 6y^7 + 22y^6 + 6y^5 + 45y^4 + 15y^3 + 22y^2 + 4y + 1)$