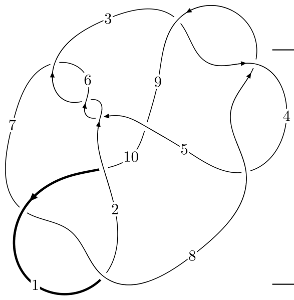
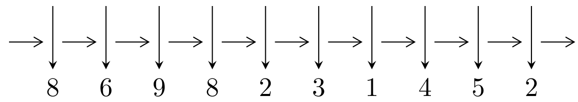
10_{142} $(K10n_{30})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$2{,}5 \xrightarrow[c_5]{} 6 \xrightarrow[c_2]{} 3{,}8 \xrightarrow[c_1]{} 1 \xrightarrow[c_4]{} 4 \xrightarrow[c_7]{} 7 \xrightarrow[c_{10}]{} 10 \xrightarrow[c_9]{} 9 \twoheadrightarrow c_3, c_6, c_8$$

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

$$I_1^u = \langle -u^5 + u^4 + 4u^3 - 5u^2 + 2b - u,\ a - 1,\ u^6 - u^5 - 5u^4 + 4u^3 + 5u^2 + u - 1\rangle$$
$$I_2^u = \langle -u^3 + b + u + 2,\ -u^3 - 2u^2 + 3a + 2u + 6,\ u^4 - u^3 - 2u^2 + 3\rangle$$
$$I_3^u = \langle b,\ a + 1,\ u + 1\rangle$$
$$I_4^u = \langle b^2 + 2,\ a + 1,\ u - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 13 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.

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

(i) Arc colorings

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

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

$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 1 \\ \frac{1}{2}u^5 - \frac{1}{2}u^4 - 2u^3 + \frac{5}{2}u^2 + \frac{1}{2}u \end{pmatrix}$$

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

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

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

$$a_{10} = \begin{pmatrix} u \\ \frac{1}{2}u^4 - \frac{1}{2}u^3 - 2u^2 + \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -u^4 + 3u^3 + 4u^2 - 11u - 13$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7	$u^6 + u^5 - 5u^4 - 4u^3 + 5u^2 - u - 1$
c_3, c_4, c_8	$u^6 + 3u^5 + 7u^4 + 10u^3 + 10u^2 + 8u + 2$
c_9	$u^6 - 3u^5 - 11u^4 + 32u^3 - 2u^2 + 16u + 10$
c_{10}	$u^6 + 11u^5 + 43u^4 + 66u^3 + 27u^2 + 11u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7	$y^6 - 11y^5 + 43y^4 - 66y^3 + 27y^2 - 11y + 1$
c_3, c_4, c_8	$y^6 + 5y^5 + 9y^4 - 4y^3 - 32y^2 - 24y + 4$
c_9	$y^6 - 31y^5 + 309y^4 - 864y^3 - 1240y^2 - 296y + 100$
c_{10}	$y^6 - 35y^5 + 451y^4 - 2274y^3 - 637y^2 - 67y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.526900+0.379519I$ $a=\;1.00000$ $b=\;0.036498-1.278320I$	$3.26038+1.42716I$	$-6.28345-4.88332I$
$u=-0.526900-0.379519I$ $a=\;1.00000$ $b=\;0.036498+1.278320I$	$3.26038-1.42716I$	$-6.28345+4.88332I$
$u=\;0.338910$ $a=\;1.00000$ $b=\;0.374390$	-0.610583	-16.1650
$u=\;1.85126+0.30576I$ $a=\;1.00000$ $b=\;0.63990+1.46861I$	$-13.0621-6.7708I$	$-12.38492+2.96218I$
$u=\;1.85126-0.30576I$ $a=\;1.00000$ $b=\;0.63990-1.46861I$	$-13.0621+6.7708I$	$-12.38492-2.96218I$
$u=-1.98762$ $a=\;1.00000$ $b=\;1.27282$	-17.6195	-14.4980

II. $\boldsymbol{I_2^u = \langle -u^3 + b + u + 2,\ -u^3 - 2u^2 + 3a + 2u + 6,\ u^4 - u^3 - 2u^2 + 3 \rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{1}{3}u^3 + \frac{2}{3}u^2 - \frac{2}{3}u - 2 \\ u^3 - u - 2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{4}{3}u^3 + \frac{1}{3}u^2 + \frac{5}{3}u + 1 \\ -u^3 - u^2 + 3u + 2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{2}{3}u^3 + \frac{1}{3}u^2 - \frac{1}{3}u - 1 \\ u^3 - u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^2 + 1 \\ -u^3 + 3 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -\frac{4}{3}u^3 + \frac{1}{3}u^2 + \frac{5}{3}u + 1 \\ u^3 - u - 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -\frac{1}{3}u^3 + \frac{1}{3}u^2 + \frac{2}{3}u \\ u^3 - u - 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7	$u^4 + u^3 - 2u^2 + 3$
c_3, c_4, c_8	$(u^2 - u + 1)^2$
c_9	$(u^2 + u + 1)^2$
c_{10}	$u^4 + 5u^3 + 10u^2 + 12u + 9$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7	$y^4 - 5y^3 + 10y^2 - 12y + 9$
c_3, c_4, c_8 c_9	$(y^2 + y + 1)^2$
c_{10}	$y^4 - 5y^3 - 2y^2 + 36y + 81$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.953264+0.702911I$ $a=-0.905826-0.839043I$ $b=-0.500000+0.866025I$	$-3.28987+2.02988I$	$-12.00000-3.46410I$
$u=-0.953264-0.702911I$ $a=-0.905826+0.839043I$ $b=-0.500000-0.866025I$	$-3.28987-2.02988I$	$-12.00000+3.46410I$
$u=\ \ 1.45326+0.16311I$ $a=-0.594174+0.550367I$ $b=-0.500000+0.866025I$	$-3.28987+2.02988I$	$-12.00000-3.46410I$
$u=\ \ 1.45326-0.16311I$ $a=-0.594174-0.550367I$ $b=-0.500000-0.866025I$	$-3.28987-2.02988I$	$-12.00000+3.46410I$

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

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_6	$u + 1$
c_2, c_7, c_{10}	$u - 1$
c_3, c_4, c_8 c_9	u

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7, c_{10}	$y - 1$
c_3, c_4, c_8 c_9	y

(vi) Complex Volumes and Cusp Shapes

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

IV. $I_4^u = \langle b^2+2,\ a+1,\ u-1 \rangle$

(i) Arc colorings

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

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

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

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

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

$$a_1 = \begin{pmatrix} 1 \\ -b+1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} b+1 \\ 2 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} 1 \\ -b \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -b+1 \\ -b \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_6 c_{10}	$(u-1)^2$
c_2, c_7	$(u+1)^2$
c_3, c_4, c_8 c_9	u^2+2

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7, c_{10}	$(y-1)^2$
c_3, c_4, c_8 c_9	$(y+2)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.00000$ $b = 1.414210I$	1.64493	−12.0000
$u = 1.00000$ $a = -1.00000$ $b = -1.414210I$	1.64493	−12.0000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5, c_6	$((u-1)^2)(u+1)(u^4+u^3-2u^2+3)(u^6+u^5+\cdots-u-1)$
c_2, c_7	$(u-1)(u+1)^2(u^4+u^3-2u^2+3)(u^6+u^5+\cdots-u-1)$
c_3, c_4, c_8	$u(u^2+2)(u^2-u+1)^2(u^6+3u^5+7u^4+10u^3+10u^2+8u+2)$
c_9	$u(u^2+2)(u^2+u+1)^2(u^6-3u^5-11u^4+32u^3-2u^2+16u+10)$
c_{10}	$(u-1)^3(u^4+5u^3+10u^2+12u+9)$ $\cdot\,(u^6+11u^5+43u^4+66u^3+27u^2+11u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_6, c_7	$(y-1)^3(y^4-5y^3+10y^2-12y+9)$ $\cdot (y^6-11y^5+43y^4-66y^3+27y^2-11y+1)$
c_3, c_4, c_8	$y(y+2)^2(y^2+y+1)^2(y^6+5y^5+9y^4-4y^3-32y^2-24y+4)$
c_9	$y(y+2)^2(y^2+y+1)^2$ $\cdot (y^6-31y^5+309y^4-864y^3-1240y^2-296y+100)$
c_{10}	$(y-1)^3(y^4-5y^3-2y^2+36y+81)$ $\cdot (y^6-35y^5+451y^4-2274y^3-637y^2-67y+1)$