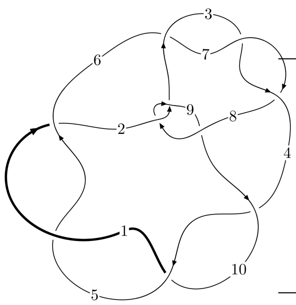
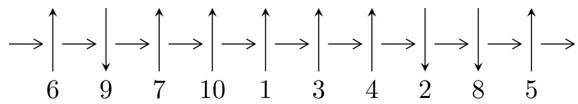
10_{62} $(K10a_{41})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{18} + 10u^{16} + \cdots + 4b + 4,\ 2u^{18} - 21u^{16} + \cdots + 4a - 6,\ u^{19} + 2u^{18} + \cdots + 2u^2 - 2\rangle$$
$$I_2^u = \langle a^2 + au + 2b - a + 2,\ a^3 - 2a^2 + au + 2a - 2u,\ u^2 - u - 1\rangle$$
$$I_3^u = \langle b + 1,\ 2a + u - 2,\ u^2 - 2\rangle$$

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

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 28 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. $I_1^u = \langle -u^{18}+10u^{16}+\cdots+4b+4,\ 2u^{18}-21u^{16}+\cdots+4a-6,\ u^{19}+2u^{18}+\cdots+2u^2-2\rangle$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_2 = \begin{pmatrix} -u^2+1 \\ u^4-2u^2 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -\frac{1}{2}u^{18}+\frac{21}{4}u^{16}+\cdots-2u+\frac{3}{2} \\ \frac{1}{4}u^{18}-\frac{5}{2}u^{16}+\cdots-\frac{1}{2}u-1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{1}{4}u^{16}-\frac{9}{4}u^{14}+\cdots-\frac{3}{2}u+\frac{1}{2} \\ -\frac{1}{4}u^{18}+\frac{5}{2}u^{16}+\cdots+3u^3-u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{1}{4}u^{16}-\frac{9}{4}u^{14}+\cdots-\frac{3}{2}u+\frac{1}{2} \\ -\frac{1}{4}u^{16}+2u^{14}+\cdots-\frac{1}{2}u^2+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{1}{4}u^{15}-2u^{13}+\cdots-\frac{1}{2}u+1 \\ -\frac{1}{4}u^{15}+2u^{13}+\cdots-\frac{1}{2}u^2-\frac{1}{2}u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2u^{18}+22u^{16}-96u^{14}-2u^{13}+210u^{12}+16u^{11}-240u^{10}-46u^9+128u^8+56u^7+12u^6-32u^5-66u^4+24u^3+20u^2-10u+8$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_5 c_{10}	$u^{19} - 2u^{18} + \cdots - 2u^2 + 2$
c_2, c_8	$u^{19} + 2u^{18} + \cdots + 5u - 1$
c_3, c_6, c_7	$u^{19} - 2u^{18} + \cdots - 7u - 1$
c_9	$u^{19} + 6u^{18} + \cdots + 29u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_5 c_{10}	$y^{19} - 22y^{18} + \cdots + 8y - 4$
c_2, c_8	$y^{19} - 6y^{18} + \cdots + 29y - 1$
c_3, c_6, c_7	$y^{19} - 22y^{18} + \cdots + 45y - 1$
c_9	$y^{19} + 18y^{18} + \cdots + 429y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.833626+0.586392I$ $a=-0.745450+0.856359I$ $b=-0.57278-1.50837I$	$6.16103-7.19649I$	$9.03544+6.33971I$
$u=-0.833626-0.586392I$ $a=-0.745450-0.856359I$ $b=-0.57278+1.50837I$	$6.16103+7.19649I$	$9.03544-6.33971I$
$u=0.976743+0.434841I$ $a=1.000180+0.545099I$ $b=0.281151-1.040530I$	$7.39549+1.39372I$	$11.32275-1.16010I$
$u=0.976743-0.434841I$ $a=1.000180-0.545099I$ $b=0.281151+1.040530I$	$7.39549-1.39372I$	$11.32275+1.16010I$
$u=0.706968+0.375087I$ $a=-0.23384-1.47789I$ $b=-0.594733+0.957959I$	$0.05288+3.91264I$	$5.51817-7.54928I$
$u=0.706968-0.375087I$ $a=-0.23384+1.47789I$ $b=-0.594733-0.957959I$	$0.05288-3.91264I$	$5.51817+7.54928I$
$u=-0.109594+0.768897I$ $a=0.397475+0.645275I$ $b=-0.268744+1.200510I$	$3.98301+2.66673I$	$7.07144-2.45976I$
$u=-0.109594-0.768897I$ $a=0.397475-0.645275I$ $b=-0.268744-1.200510I$	$3.98301-2.66673I$	$7.07144+2.45976I$
$u=1.37410$ $a=0.844357$ $b=-0.0493609$	6.50526	14.0760
$u=-1.43916$ $a=1.03336$ $b=-1.13820$	3.34099	2.02410

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.169186 + 0.450873I$ $a = 0.191882 - 0.311707I$ $b = -0.742122 - 0.473186I$	$-1.52268 - 0.97340I$	$-1.44998 + 1.44252I$
$u = 0.169186 - 0.450873I$ $a = 0.191882 + 0.311707I$ $b = -0.742122 + 0.473186I$	$-1.52268 + 0.97340I$	$-1.44998 - 1.44252I$
$u = -0.449480$ $a = 1.73887$ $b = -0.213083$	0.876243	12.3180
$u = -1.62272 + 0.09591I$ $a = 0.13568 + 1.94903I$ $b = -0.46328 - 1.41274I$	$8.08934 - 5.62533I$	$8.31274 + 4.90801I$
$u = -1.62272 - 0.09591I$ $a = 0.13568 - 1.94903I$ $b = -0.46328 + 1.41274I$	$8.08934 + 5.62533I$	$8.31274 - 4.90801I$
$u = 1.66085 + 0.17438I$ $a = -0.14379 - 1.92619I$ $b = -0.79811 + 1.82654I$	$14.6774 + 10.1415I$	$10.53245 - 5.16770I$
$u = 1.66085 - 0.17438I$ $a = -0.14379 + 1.92619I$ $b = -0.79811 - 1.82654I$	$14.6774 - 10.1415I$	$10.53245 + 5.16770I$
$u = -1.69053 + 0.10897I$ $a = 0.089568 - 1.231990I$ $b = 0.85893 + 1.17135I$	$16.6648 - 3.4892I$	$12.44780 + 0.95664I$
$u = -1.69053 - 0.10897I$ $a = 0.089568 + 1.231990I$ $b = 0.85893 - 1.17135I$	$16.6648 + 3.4892I$	$12.44780 - 0.95664I$

II. $I_2^u = \langle a^2 + au + 2b - a + 2,\ a^3 - 2a^2 + au + 2a - 2u,\ u^2 - u - 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_5 c_{10}	$(u^2+u-1)^3$
c_2, c_3, c_6 c_7, c_8	$u^6-2u^4-u^3+u^2+u-1$
c_9	$u^6+4u^5+6u^4+7u^3+7u^2+3u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_5 c_{10}	$(y^2 - 3y + 1)^3$
c_2, c_3, c_6 c_7, c_8	$y^6 - 4y^5 + 6y^4 - 7y^3 + 7y^2 - 3y + 1$
c_9	$y^6 - 4y^5 - 6y^4 + 13y^3 + 19y^2 + 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = -0.480334$ $b = -1.50396$	0.986960	10.0000
$u = -0.618034$ $a = 1.24017 + 1.01752I$ $b = -0.248021 - 0.438702I$	0.986960	10.0000
$u = -0.618034$ $a = 1.24017 - 1.01752I$ $b = -0.248021 + 0.438702I$	0.986960	10.0000
$u = 1.61803$ $a = 1.21468$ $b = -2.11309$	8.88264	10.0000
$u = 1.61803$ $a = 0.39266 + 1.58428I$ $b = 0.056543 - 1.111650I$	8.88264	10.0000
$u = 1.61803$ $a = 0.39266 - 1.58428I$ $b = 0.056543 + 1.111650I$	8.88264	10.0000

III. $I_3^u = \langle b+1,\ 2a+u-2,\ u^2-2\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.41421$ $a = 0.292893$ $b = -1.00000$	4.93480	8.00000
$u = -1.41421$ $a = 1.70711$ $b = -1.00000$	4.93480	8.00000

IV. $\boldsymbol{I_1^v = \langle a,\ b+1,\ v-1\rangle}$

(i) Arc colorings

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

$a_{10} = \begin{pmatrix}1\\0\end{pmatrix}$

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

$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$

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

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

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

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

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4, c_5 c_{10}	$u(u^2-2)(u^2+u-1)^3(u^{19}-2u^{18}+\cdots-2u^2+2)$
c_2	$((u-1)^2)(u+1)(u^6-2u^4+\cdots+u-1)(u^{19}+2u^{18}+\cdots+5u-1)$
c_3	$((u-1)^2)(u+1)(u^6-2u^4+\cdots+u-1)(u^{19}-2u^{18}+\cdots-7u-1)$
c_6, c_7	$(u-1)(u+1)^2(u^6-2u^4+\cdots+u-1)(u^{19}-2u^{18}+\cdots-7u-1)$
c_8	$(u-1)(u+1)^2(u^6-2u^4+\cdots+u-1)(u^{19}+2u^{18}+\cdots+5u-1)$
c_9	$(u+1)^3(u^6+4u^5+6u^4+7u^3+7u^2+3u+1)$ $\cdot(u^{19}+6u^{18}+\cdots+29u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_5 c_{10}	$y(y-2)^2(y^2-3y+1)^3(y^{19}-22y^{18}+\cdots+8y-4)$
c_2, c_8	$(y-1)^3(y^6-4y^5+6y^4-7y^3+7y^2-3y+1)$ $\cdot(y^{19}-6y^{18}+\cdots+29y-1)$
c_3, c_6, c_7	$(y-1)^3(y^6-4y^5+6y^4-7y^3+7y^2-3y+1)$ $\cdot(y^{19}-22y^{18}+\cdots+45y-1)$
c_9	$(y-1)^3(y^6-4y^5-6y^4+13y^3+19y^2+5y+1)$ $\cdot(y^{19}+18y^{18}+\cdots+429y-1)$