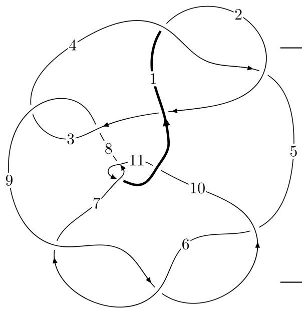
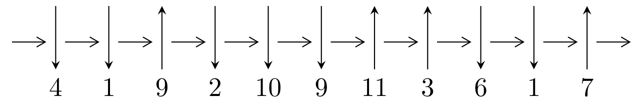
$11n_{67}$ ($K11n_{67}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$5,10 \xrightarrow[c_5]{} 2,6 \xrightarrow[c_4]{} 4 \xrightarrow[c_1]{} 1 \xrightarrow[c_9]{} 9 \xrightarrow[c_6]{} 7 \xrightarrow[c_3]{} 3 \xrightarrow[c_{11}]{} 11 \xrightarrow[c_7]{} 8 \twoheadrightarrow c_2, c_8, c_{10}$$

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

$$\begin{aligned}
I_1^u = \langle & -53523809u^{13} + 113678375u^{12} + \cdots + 2227279840b + 1256772587, \\
& -7347336541u^{13} + 13427745311u^{12} + \cdots + 75727514560a + 1617396731, \\
& u^{14} - 2u^{13} + \cdots + 24u + 17\rangle \\
I_2^u = \langle & b + 1,\ -u^3 + 2u^2 + 2a - 3u + 5,\ u^4 - u^3 + 3u^2 - 2u + 1\rangle \\
I_3^u = \langle & -a^2u - 2a^2 + 4au + 5b + 3a - 5,\ a^3 - 3a^2u - 2a^2 + au - a + u - 2,\ u^2 + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 24 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.
$\boldsymbol{I_1^u = \langle -5.35\times 10^{7}u^{13}+1.14\times 10^{8}u^{12}+\cdots+2.23\times 10^{9}b+1.26\times 10^{9},\ -7.35\times 10^{9}u^{13}+1.34\times 10^{10}u^{12}+\cdots+7.57\times 10^{10}a+1.62\times 10^{9},\ u^{14}-2u^{13}+\cdots+24u+17\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}0.0970233u^{13}-0.177317u^{12}+\cdots+5.72525u-0.0213581\\0.0240310u^{13}-0.0510391u^{12}+\cdots+0.391365u-0.564263\end{pmatrix}$$
$$a_6 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}0.0860286u^{13}-0.162052u^{12}+\cdots+4.32173u+0.0613420\\0.0297616u^{13}-0.0719847u^{12}+\cdots+0.0943418u-0.681013\end{pmatrix}$$
$$a_1 = \begin{pmatrix}0.0390836u^{13}-0.0710568u^{12}+\cdots+3.02865u+0.931294\\0.00745046u^{13}-0.0211156u^{12}+\cdots+0.794129u+0.282743\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u^2+1\\u^4+2u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}0.0815510u^{13}-0.158251u^{12}+\cdots+3.40648u-0.102474\\0.0311547u^{13}-0.0816865u^{12}+\cdots-0.621089u-0.757212\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0.0118356u^{13}-0.0182548u^{12}+\cdots+1.04576u+0.329948\\-0.00412141u^{13}+0.0230782u^{12}+\cdots+1.46293u+0.190664\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-0.0299569u^{13}+0.0755900u^{12}+\cdots+0.453086u+0.932725\\0.00941903u^{13}+0.0187909u^{12}+\cdots+0.243684u+0.271269\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-0.0299569u^{13}+0.0755900u^{12}+\cdots+0.453086u+0.932725\\0.00941903u^{13}+0.0187909u^{12}+\cdots+0.243684u+0.271269\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{159749339}{1781823872}u^{13}-\frac{841106653}{8909119360}u^{12}+\cdots-\frac{20311908351}{8909119360}u-\frac{30534615889}{8909119360}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^{14} - 7u^{13} + \cdots + 3u + 4$
c_2	$u^{14} - 3u^{13} + \cdots - 127u + 16$
c_3, c_8	$u^{14} + 8u^{13} + \cdots + 80u + 64$
c_5, c_6, c_9	$u^{14} - 2u^{13} + \cdots + 24u + 17$
c_7, c_{11}	$u^{14} - 2u^{13} + \cdots - 12u + 17$
c_{10}	$u^{14} - 4u^{13} + \cdots + 2066u + 289$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^{14} + 3y^{13} + \cdots + 127y + 16$
c_2	$y^{14} + 47y^{13} + \cdots + 32223y + 256$
c_3, c_8	$y^{14} - 42y^{13} + \cdots + 4864y + 4096$
c_5, c_6, c_9	$y^{14} + 28y^{13} + \cdots + 2994y + 289$
c_7, c_{11}	$y^{14} - 4y^{13} + \cdots + 2066y + 289$
c_{10}	$y^{14} + 52y^{13} + \cdots + 189758y + 83521$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.739038 + 0.298276I$ $a = 0.673213 - 0.315821I$ $b = 0.313142 - 0.702457I$	$0.02319 + 2.21939I$	$-1.77809 - 3.53992I$
$u = -0.739038 - 0.298276I$ $a = 0.673213 + 0.315821I$ $b = 0.313142 + 0.702457I$	$0.02319 - 2.21939I$	$-1.77809 + 3.53992I$
$u = -0.267566 + 0.668739I$ $a = 0.619498 - 0.223590I$ $b = -0.172651 + 0.268532I$	$0.212568 + 1.285480I$	$1.55268 - 6.08941I$
$u = -0.267566 - 0.668739I$ $a = 0.619498 + 0.223590I$ $b = -0.172651 - 0.268532I$	$0.212568 - 1.285480I$	$1.55268 + 6.08941I$
$u = 0.01822 + 1.41811I$ $a = 0.361569 + 0.414725I$ $b = 0.983382 - 0.463084I$	$5.01039 + 4.24504I$	$1.99936 - 6.80413I$
$u = 0.01822 - 1.41811I$ $a = 0.361569 - 0.414725I$ $b = 0.983382 + 0.463084I$	$5.01039 - 4.24504I$	$1.99936 + 6.80413I$
$u = 0.120536 + 0.452712I$ $a = -3.28623 + 1.15613I$ $b = -1.024040 - 0.163148I$	$-2.12302 - 0.75753I$	$-7.75042 - 3.06748I$
$u = 0.120536 - 0.452712I$ $a = -3.28623 - 1.15613I$ $b = -1.024040 + 0.163148I$	$-2.12302 + 0.75753I$	$-7.75042 + 3.06748I$
$u = 0.60560 + 1.93212I$ $a = 0.342835 - 1.047120I$ $b = 1.50068 + 1.04479I$	$-19.4276 - 10.6503I$	$-1.06301 + 4.03963I$
$u = 0.60560 - 1.93212I$ $a = 0.342835 + 1.047120I$ $b = 1.50068 - 1.04479I$	$-19.4276 + 10.6503I$	$-1.06301 - 4.03963I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.05779 + 1.83805I$ $a = 0.405077 - 0.680123I$ $b = 0.63249 + 1.72109I$	$9.20003 - 2.06852I$	$0.364251 + 1.127832I$
$u = 1.05779 - 1.83805I$ $a = 0.405077 + 0.680123I$ $b = 0.63249 - 1.72109I$	$9.20003 + 2.06852I$	$0.364251 - 1.127832I$
$u = 0.20446 + 2.50927I$ $a = -0.130671 + 0.682293I$ $b = 1.26699 - 1.74372I$	$-17.5696 - 0.3825I$	$-0.199766 + 0.045547I$
$u = 0.20446 - 2.50927I$ $a = -0.130671 - 0.682293I$ $b = 1.26699 + 1.74372I$	$-17.5696 + 0.3825I$	$-0.199766 - 0.045547I$

II. $I_2^u = \langle b+1,\ -u^3+2u^2+2a-3u+5,\ u^4-u^3+3u^2-2u+1\rangle$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} \frac{1}{2}u^3 - u^2 + \frac{3}{2}u - \frac{5}{2} \\ -1 \end{pmatrix}$$

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

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

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

$$a_9 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{23}{4}u^3 - \frac{11}{2}u^2 + \frac{59}{4}u - \frac{33}{4}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u-1)^4$
c_2, c_4	$(u+1)^4$
c_3, c_8	u^4
c_5, c_6, c_{10}	$u^4 - u^3 + 3u^2 - 2u + 1$
c_7	$u^4 - u^3 + u^2 + 1$
c_9	$u^4 + u^3 + 3u^2 + 2u + 1$
c_{11}	$u^4 + u^3 + u^2 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^4$
c_3, c_8	y^4
c_5, c_6, c_9 c_{10}	$y^4+5y^3+7y^2+2y+1$
c_7, c_{11}	$y^4+y^3+3y^2+2y+1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.395123 + 0.506844I$ $a = -1.92796 + 0.41333I$ $b = -1.00000$	$-1.85594 - 1.41510I$	$-3.26394 + 5.88934I$
$u = \quad 0.395123 - 0.506844I$ $a = -1.92796 - 0.41333I$ $b = -1.00000$	$-1.85594 + 1.41510I$	$-3.26394 - 5.88934I$
$u = \quad 0.10488 + 1.55249I$ $a = -0.322042 + 0.157780I$ $b = -1.00000$	$5.14581 - 3.16396I$	$2.13894 - 0.11292I$
$u = \quad 0.10488 - 1.55249I$ $a = -0.322042 - 0.157780I$ $b = -1.00000$	$5.14581 + 3.16396I$	$2.13894 + 0.11292I$

III.

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

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} a \\ \frac{1}{5}a^2u + \frac{2}{5}a^2 - \frac{4}{5}au - \frac{3}{5}a + 1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -\frac{4}{5}a^2u + \frac{2}{5}a^2 + \frac{1}{5}au - \frac{8}{5}a \\ \frac{1}{5}a^2u - \frac{3}{5}a^2 + \frac{6}{5}au + \frac{7}{5}a \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u \\ \frac{2}{5}a^2u - \frac{1}{5}a^2 + \frac{2}{5}au + \frac{4}{5}a + 2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -\frac{3}{5}a^2u - \frac{1}{5}a^2 + \frac{7}{5}au - \frac{1}{5}a \\ \frac{1}{5}a^2u - \frac{3}{5}a^2 + \frac{6}{5}au + \frac{7}{5}a \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ \frac{2}{5}a^2u + \frac{2}{5}au + \cdots + \frac{4}{5}a + 2 \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{4}{5}a^2u + \frac{8}{5}a^2 - \frac{16}{5}au - \frac{12}{5}a$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^3 + u^2 - 1)^2$
c_2	$(u^3 + u^2 + 2u + 1)^2$
c_3, c_8	$u^6 - 3u^4 + 2u^2 + 1$
c_4	$(u^3 - u^2 + 1)^2$
c_5, c_6, c_7 c_9, c_{11}	$(u^2 + 1)^3$
c_{10}	$(u - 1)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$(y^3 - y^2 + 2y - 1)^2$
c_2	$(y^3 + 3y^2 + 2y - 1)^2$
c_3, c_8	$(y^3 - 3y^2 + 2y + 1)^2$
c_5, c_6, c_7 c_9, c_{11}	$(y + 1)^6$
c_{10}	$(y - 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = 0.684841 + 1.082500I$ $b = 0.877439 - 0.744862I$	$3.02413 + 2.82812I$	$-0.49024 - 2.97945I$
$u = 1.000000I$ $a = -0.439718 - 0.407221I$ $b = 0.877439 + 0.744862I$	$3.02413 - 2.82812I$	$-0.49024 + 2.97945I$
$u = 1.000000I$ $a = 1.75488 + 2.32472I$ $b = -0.754878$	-1.11345	$-7.01951 + 0.I$
$u = -1.000000I$ $a = 0.684841 - 1.082500I$ $b = 0.877439 + 0.744862I$	$3.02413 - 2.82812I$	$-0.49024 + 2.97945I$
$u = -1.000000I$ $a = -0.439718 + 0.407221I$ $b = 0.877439 - 0.744862I$	$3.02413 + 2.82812I$	$-0.49024 - 2.97945I$
$u = -1.000000I$ $a = 1.75488 - 2.32472I$ $b = -0.754878$	-1.11345	$-7.01951 + 0.I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^4)(u^3+u^2-1)^2(u^{14}-7u^{13}+\cdots+3u+4)$
c_2	$((u+1)^4)(u^3+u^2+2u+1)^2(u^{14}-3u^{13}+\cdots-127u+16)$
c_3, c_8	$u^4(u^6-3u^4+2u^2+1)(u^{14}+8u^{13}+\cdots+80u+64)$
c_4	$((u+1)^4)(u^3-u^2+1)^2(u^{14}-7u^{13}+\cdots+3u+4)$
c_5, c_6	$((u^2+1)^3)(u^4-u^3+3u^2-2u+1)(u^{14}-2u^{13}+\cdots+24u+17)$
c_7	$((u^2+1)^3)(u^4-u^3+u^2+1)(u^{14}-2u^{13}+\cdots-12u+17)$
c_9	$((u^2+1)^3)(u^4+u^3+3u^2+2u+1)(u^{14}-2u^{13}+\cdots+24u+17)$
c_{10}	$((u-1)^6)(u^4-u^3+3u^2-2u+1)(u^{14}-4u^{13}+\cdots+2066u+289)$
c_{11}	$((u^2+1)^3)(u^4+u^3+u^2+1)(u^{14}-2u^{13}+\cdots-12u+17)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4	$((y-1)^4)(y^3-y^2+2y-1)^2(y^{14}+3y^{13}+\cdots+127y+16)$
c_2	$((y-1)^4)(y^3+3y^2+2y-1)^2(y^{14}+47y^{13}+\cdots+32223y+256)$
c_3, c_8	$y^4(y^3-3y^2+2y+1)^2(y^{14}-42y^{13}+\cdots+4864y+4096)$
c_5, c_6, c_9	$((y+1)^6)(y^4+5y^3+\cdots+2y+1)(y^{14}+28y^{13}+\cdots+2994y+289)$
c_7, c_{11}	$((y+1)^6)(y^4+y^3+3y^2+2y+1)(y^{14}-4y^{13}+\cdots+2066y+289)$
c_{10}	$(y-1)^6(y^4+5y^3+7y^2+2y+1)$ $\cdot\,(y^{14}+52y^{13}+\cdots+189758y+83521)$