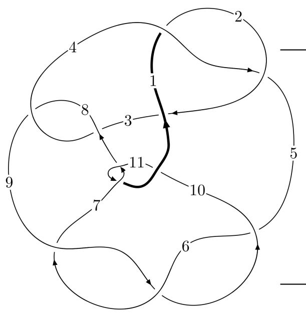
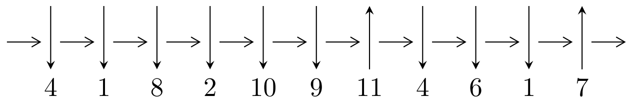
$11n_{69}$ ($K11n_{69}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 3951u^{19} + 6529u^{18} + \cdots + 2424b + 6325,\ -115811u^{19} - 169485u^{18} + \cdots + 79992a - 272713,$$
$$u^{20} + 2u^{19} + \cdots + 2u + 1 \rangle$$
$$I_2^u = \langle u^3 + 2b - u + 1,\ -u^3 + 2u^2 + 2a - 3u + 1,\ u^4 - u^3 + u^2 + 1 \rangle$$
$$I_3^u = \langle u^5 + u^4 + u^3 - u^2 + b - 2u,\ u^4 - u^3 + u^2 + a - 3u + 2,\ u^6 + 2u^4 - 3u^3 + u^2 - 3u + 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 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. $I^u_1 = \langle 3951u^{19} + 6529u^{18} + \cdots + 2424b + 6325,\ -1.16 \times 10^5 u^{19} - 1.69 \times 10^5 u^{18} + \cdots + 8.00 \times 10^4 a - 2.73 \times 10^5,\ u^{20} + 2u^{19} + \cdots + 2u + 1\rangle$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1.44778u^{19} + 2.11877u^{18} + \cdots + 7.14120u + 3.40925 \\ -1.62995u^{19} - 2.69348u^{18} + \cdots + 1.21988u - 2.60932 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.490249u^{19} - 0.377738u^{18} + \cdots + 1.43684u - 0.710171 \\ 2.45375u^{19} + 3.57816u^{18} + \cdots + 2.48335u + 4.64226 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.315419u^{19} + 0.424955u^{18} + \cdots + 8.46688u + 1.57672 \\ -1.38148u^{19} - 2.28739u^{18} + \cdots + 1.22934u - 2.03842 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.349372u^{19} - 0.474610u^{18} + \cdots + 8.80089u + 0.895277 \\ -2.04627u^{19} - 3.18696u^{18} + \cdots + 1.56334u - 2.71986 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 3.68497u^{19} + 5.12691u^{18} + \cdots - 2.11341u + 4.48245 \\ -0.354535u^{19} - 0.633363u^{18} + \cdots - 0.327633u - 1.82848 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -4.03950u^{19} - 5.76028u^{18} + \cdots + 1.78578u - 5.31093 \\ -1.32933u^{19} - 1.83018u^{18} + \cdots - 0.265227u - 1.45375 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{189289}{17776}u^{19} + \frac{857557}{53328}u^{18} + \cdots + \frac{286735}{53328}u + \frac{706201}{53328}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^{20} - 2u^{19} + \cdots - 35u + 4$
c_2	$u^{20} + 22u^{19} + \cdots + 353u + 16$
c_3, c_8	$u^{20} + 2u^{19} + \cdots + 112u + 64$
c_5, c_6, c_9	$u^{20} - 2u^{19} + \cdots - 2u + 1$
c_7, c_{11}	$u^{20} - 2u^{19} + \cdots - 2u + 1$
c_{10}	$u^{20} + 14u^{19} + \cdots + 4u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^{20} - 22y^{19} + \cdots - 353y + 16$
c_2	$y^{20} - 46y^{19} + \cdots + 223775y + 256$
c_3, c_8	$y^{20} - 18y^{19} + \cdots + 45824y + 4096$
c_5, c_6, c_9	$y^{20} + 14y^{19} + \cdots + 4y + 1$
c_7, c_{11}	$y^{20} + 14y^{19} + \cdots + 4y + 1$
c_{10}	$y^{20} - 14y^{19} + \cdots + 56y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.131630 + 0.044257I$ $a = 0.0439473 + 0.1087160I$ $b = 1.40407 + 0.37862I$	$-4.62345 - 6.11364I$	$-7.31633 + 3.70196I$
$u = -1.131630 - 0.044257I$ $a = 0.0439473 - 0.1087160I$ $b = 1.40407 - 0.37862I$	$-4.62345 + 6.11364I$	$-7.31633 - 3.70196I$
$u = -0.280810 + 0.786452I$ $a = -0.395074 + 0.246972I$ $b = -0.197007 + 0.388860I$	$-0.440396 - 1.279690I$	$-4.66436 + 4.97948I$
$u = -0.280810 - 0.786452I$ $a = -0.395074 - 0.246972I$ $b = -0.197007 - 0.388860I$	$-0.440396 + 1.279690I$	$-4.66436 - 4.97948I$
$u = 0.769131 + 0.907087I$ $a = 0.304381 - 0.204058I$ $b = -0.165796 + 0.163987I$	$5.68828 + 2.93127I$	$2.45037 - 0.45578I$
$u = 0.769131 - 0.907087I$ $a = 0.304381 + 0.204058I$ $b = -0.165796 - 0.163987I$	$5.68828 - 2.93127I$	$2.45037 + 0.45578I$
$u = 0.167664 + 1.190790I$ $a = 1.75974 + 0.44692I$ $b = 1.243080 - 0.457519I$	$-4.30761 + 1.95796I$	$-13.39097 - 1.55059I$
$u = 0.167664 - 1.190790I$ $a = 1.75974 - 0.44692I$ $b = 1.243080 + 0.457519I$	$-4.30761 - 1.95796I$	$-13.39097 + 1.55059I$
$u = 0.050177 + 1.253190I$ $a = 0.722975 + 0.985298I$ $b = 0.495740 - 0.417798I$	$-5.41434 + 1.81549I$	$-13.14101 - 3.54833I$
$u = 0.050177 - 1.253190I$ $a = 0.722975 - 0.985298I$ $b = 0.495740 + 0.417798I$	$-5.41434 - 1.81549I$	$-13.14101 + 3.54833I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.261687+1.231270I$ $a=-2.05611+0.13028I$ $b=-1.122580-0.533009I$	$-2.03730-5.64317I$	$-8.76092+6.80873I$
$u=-0.261687-1.231270I$ $a=-2.05611-0.13028I$ $b=-1.122580+0.533009I$	$-2.03730+5.64317I$	$-8.76092-6.80873I$
$u=-0.553404+0.030516I$ $a=-0.394310+0.673104I$ $b=-0.895721-0.664676I$	$1.73140-2.57417I$	$-2.05095+4.12677I$
$u=-0.553404-0.030516I$ $a=-0.394310-0.673104I$ $b=-0.895721+0.664676I$	$1.73140+2.57417I$	$-2.05095-4.12677I$
$u=-0.52166+1.39992I$ $a=\quad 1.63987-0.44598I$ $b=\quad 1.74672+0.69883I$	$-9.1950-11.9560I$	$-9.10352+6.09824I$
$u=-0.52166-1.39992I$ $a=\quad 1.63987+0.44598I$ $b=\quad 1.74672-0.69883I$	$-9.1950+11.9560I$	$-9.10352-6.09824I$
$u=\quad 0.54264+1.40344I$ $a=-1.38809-0.74127I$ $b=-1.65276+0.37354I$	$-13.3225+5.9895I$	$-12.03384-3.05262I$
$u=\quad 0.54264-1.40344I$ $a=-1.38809+0.74127I$ $b=-1.65276-0.37354I$	$-13.3225-5.9895I$	$-12.03384+3.05262I$
$u=\quad 0.219579+0.305083I$ $a=-0.48733+3.67126I$ $b=\quad 0.894252+0.888486I$	$-0.977750+0.984957I$	$-3.11347+0.07087I$
$u=\quad 0.219579-0.305083I$ $a=-0.48733-3.67126I$ $b=\quad 0.894252-0.888486I$	$-0.977750-0.984957I$	$-3.11347-0.07087I$

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

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

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

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

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

$$a_{10} = \begin{pmatrix} u^3 \\ u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^3 \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{1}{4}u^3 - \frac{9}{2}u^2 + \frac{9}{4}u - \frac{53}{4}$

(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
$u = -0.351808 + 0.720342I$ $a = -0.38053 + 1.53420I$ $b = -0.927958 + 0.413327I$	$-1.85594 - 1.41510I$	$-12.38954 + 3.92814I$
$u = -0.351808 - 0.720342I$ $a = -0.38053 - 1.53420I$ $b = -0.927958 - 0.413327I$	$-1.85594 + 1.41510I$	$-12.38954 - 3.92814I$
$u = 0.851808 + 0.911292I$ $a = 0.130534 + 0.427872I$ $b = 0.677958 - 0.157780I$	$5.14581 + 3.16396I$	$-10.48546 - 5.24252I$
$u = 0.851808 - 0.911292I$ $a = 0.130534 - 0.427872I$ $b = 0.677958 + 0.157780I$	$5.14581 - 3.16396I$	$-10.48546 + 5.24252I$

III. $\boldsymbol{I_3^u =}$
$\boldsymbol{\langle u^5+u^4+u^3-u^2+b-2u,\ u^4-u^3+u^2+a-3u+2,\ u^6+2u^4-3u^3+u^2-3u+1\rangle}$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^4+u^3-u^2+3u-2 \\ -u^5-u^4-u^3+u^2+2u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^4-u^2+2u-1 \\ -u^4+2u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 2u-1 \\ u^2+2u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^4+u^2-1 \\ u^4+2u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^2+1 \\ -u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^3+u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ u^3+u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_8	$(u^2 - u - 1)^3$
c_2	$(u^2 + 3u + 1)^3$
c_5, c_6, c_7 c_9, c_{11}	$u^6 + 2u^4 + 3u^3 + u^2 + 3u + 1$
c_{10}	$u^6 + 4u^5 + 6u^4 - 3u^3 - 13u^2 - 7u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_8	$(y^2 - 3y + 1)^3$
c_2	$(y^2 - 7y + 1)^3$
c_5, c_6, c_7 c_9, c_{11}	$y^6 + 4y^5 + 6y^4 - 3y^3 - 13y^2 - 7y + 1$
c_{10}	$y^6 - 4y^5 + 34y^4 - 107y^3 + 139y^2 - 75y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.170987+1.042930I$ $a=-1.89470+1.68750I$ $b=-1.98931+1.11042I$	-0.986960	-10.0000
$u=-0.170987-1.042930I$ $a=-1.89470-1.68750I$ $b=-1.98931-1.11042I$	-0.986960	-10.0000
$u=\ \ 1.13928$ $a=-0.0860817$ $b=-1.50630$	-8.88264	-10.0000
$u=-0.56964+1.40480I$ $a=\ \ 0.970092-0.868217I$ $b=\ \ 1.371190+0.120928I$	-8.88264	-10.0000
$u=-0.56964-1.40480I$ $a=\ \ 0.970092+0.868217I$ $b=\ \ 1.371190-0.120928I$	-8.88264	-10.0000
$u=\ \ 0.341974$ $a=-1.06471$ $b=\ \ 0.742547$	-0.986960	-10.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^4)(u^2-u-1)^3(u^{20}-2u^{19}+\cdots-35u+4)$
c_2	$((u+1)^4)(u^2+3u+1)^3(u^{20}+22u^{19}+\cdots+353u+16)$
c_3, c_8	$u^4(u^2-u-1)^3(u^{20}+2u^{19}+\cdots+112u+64)$
c_4	$((u+1)^4)(u^2-u-1)^3(u^{20}-2u^{19}+\cdots-35u+4)$
c_5, c_6	$(u^4-u^3+3u^2-2u+1)(u^6+2u^4+3u^3+u^2+3u+1)$ $\cdot(u^{20}-2u^{19}+\cdots-2u+1)$
c_7	$(u^4-u^3+u^2+1)(u^6+2u^4+\cdots+3u+1)(u^{20}-2u^{19}+\cdots-2u+1)$
c_9	$(u^4+u^3+3u^2+2u+1)(u^6+2u^4+3u^3+u^2+3u+1)$ $\cdot(u^{20}-2u^{19}+\cdots-2u+1)$
c_{10}	$(u^4-u^3+3u^2-2u+1)(u^6+4u^5+6u^4-3u^3-13u^2-7u+1)$ $\cdot(u^{20}+14u^{19}+\cdots+4u+1)$
c_{11}	$(u^4+u^3+u^2+1)(u^6+2u^4+\cdots+3u+1)(u^{20}-2u^{19}+\cdots-2u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4	$((y-1)^4)(y^2-3y+1)^3(y^{20}-22y^{19}+\cdots-353y+16)$
c_2	$((y-1)^4)(y^2-7y+1)^3(y^{20}-46y^{19}+\cdots+223775y+256)$
c_3, c_8	$y^4(y^2-3y+1)^3(y^{20}-18y^{19}+\cdots+45824y+4096)$
c_5, c_6, c_9	$(y^4+5y^3+7y^2+2y+1)(y^6+4y^5+6y^4-3y^3-13y^2-7y+1)$ $\cdot(y^{20}+14y^{19}+\cdots+4y+1)$
c_7, c_{11}	$(y^4+y^3+3y^2+2y+1)(y^6+4y^5+6y^4-3y^3-13y^2-7y+1)$ $\cdot(y^{20}+14y^{19}+\cdots+4y+1)$
c_{10}	$(y^4+5y^3+7y^2+2y+1)(y^6-4y^5+\cdots-75y+1)$ $\cdot(y^{20}-14y^{19}+\cdots+56y+1)$