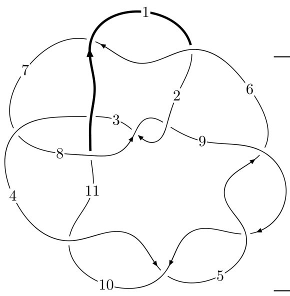
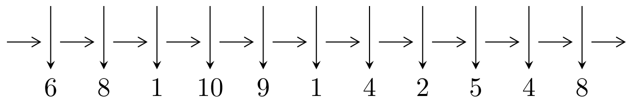
$11n_{181}$ ($K11n_{181}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & u^{12} - 5u^{11} + 18u^{10} - 47u^9 + 95u^8 - 157u^7 + 208u^6 - 225u^5 + 194u^4 - 129u^3 + 62u^2 + 2b - 19u + 2, \\
& u^{12} - 3u^{11} + 14u^{10} - 31u^9 + 73u^8 - 119u^7 + 178u^6 - 209u^5 + 208u^4 - 165u^3 + 104u^2 + 4a - 45u + 12, \\
& u^{13} - 5u^{12} + \cdots + 30u - 4\rangle \\
I_2^u = \langle & -a^3u^3 - a^3u^2 - a^3u + a^2u^2 + u^3a + a^2u - u^3 + au - u^2 + b + a - 2u + 1, \\
& -a^3u^3 + u^3a^2 + a^4 - 2a^3u + 6u^3a + 2a^2u + 5u^2a + 4u^3 - a^2 + 15au + 6u^2 + 10a + 11u + 12, \\
& u^4 + u^3 + 3u^2 + 2u + 1\rangle \\
I_3^u = \langle & u^4 + u^3 + 2u^2 + b + 2u,\ u^2 + a + 2,\ u^7 + 5u^5 + 7u^3 + 2u - 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 36 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.

$\boldsymbol{I_1^u = \langle u^{12}-5u^{11}+\cdots+2b+2,\ u^{12}-3u^{11}+\cdots+4a+12,\ u^{13}-5u^{12}+\cdots+30u-4\rangle}$

(i) Arc colorings

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

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

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

$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{12} + \frac{3}{4}u^{11} + \cdots + \frac{45}{4}u - 3 \\ -\frac{1}{2}u^{12} + \frac{5}{2}u^{11} + \cdots + \frac{19}{2}u - 1 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} \frac{1}{4}u^{12} - \frac{3}{4}u^{11} + \cdots + \frac{27}{4}u - 2 \\ \frac{1}{2}u^{12} - \frac{5}{2}u^{11} + \cdots - \frac{37}{2}u + 3 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} \frac{1}{2}u^{12} - 2u^{11} + \cdots - \frac{29}{2}u + \frac{7}{2} \\ \frac{1}{2}u^{12} - \frac{5}{2}u^{11} + \cdots - \frac{31}{2}u + 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^{12} - \frac{9}{2}u^{11} + \cdots - 28u + \frac{9}{2} \\ -\frac{1}{2}u^{12} + \frac{5}{2}u^{11} + \cdots + \frac{31}{2}u - 2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{1}{2}u^{12} + 2u^{11} + \cdots + \frac{5}{2}u + \frac{1}{2} \\ \frac{1}{2}u^{12} - \frac{5}{2}u^{11} + \cdots - \frac{25}{2}u + 2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $=$
$-u^{12}+5u^{11}-20u^{10}+54u^9-121u^8+212u^7-314u^6+374u^5-372u^4+295u^3-186u^2+88u-34$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_6 c_8	$u^{13} + 5u^{11} + \cdots + 2u + 1$
c_3	$u^{13} - 12u^{12} + \cdots - 16u + 16$
c_4, c_5, c_9 c_{10}	$u^{13} + 5u^{12} + \cdots + 30u + 4$
c_7, c_{11}	$u^{13} + u^{12} + \cdots + 3u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$y^{13} + 10y^{12} + \cdots + 30y^2 - 1$
c_3	$y^{13} - 6y^{12} + \cdots + 4480y - 256$
c_4, c_5, c_9 c_{10}	$y^{13} + 15y^{12} + \cdots + 124y - 16$
c_7, c_{11}	$y^{13} - 17y^{12} + \cdots + 25y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.144857 + 0.988588I$ $a = 0.636883 - 0.256528I$ $b = -0.881451 - 0.164723I$	$2.39689 - 1.47210I$	$-6.76905 + 4.68228I$
$u = 0.144857 - 0.988588I$ $a = 0.636883 + 0.256528I$ $b = -0.881451 + 0.164723I$	$2.39689 + 1.47210I$	$-6.76905 - 4.68228I$
$u = 0.698010 + 0.761843I$ $a = -1.308540 - 0.343629I$ $b = 1.138990 - 0.122915I$	$-1.53379 - 7.84030I$	$-8.79484 + 6.42108I$
$u = 0.698010 - 0.761843I$ $a = -1.308540 + 0.343629I$ $b = 1.138990 + 0.122915I$	$-1.53379 + 7.84030I$	$-8.79484 - 6.42108I$
$u = 0.853563 + 0.271566I$ $a = 0.142752 - 1.224120I$ $b = 0.206699 + 0.270697I$	$-3.02361 + 2.70878I$	$-9.87229 - 2.50117I$
$u = 0.853563 - 0.271566I$ $a = 0.142752 + 1.224120I$ $b = 0.206699 - 0.270697I$	$-3.02361 - 2.70878I$	$-9.87229 + 2.50117I$
$u = 0.360660 + 1.314350I$ $a = 0.518668 + 0.256927I$ $b = -0.921497 - 0.693070I$	$1.92199 - 1.66881I$	$-4.76442 + 0.86409I$
$u = 0.360660 - 1.314350I$ $a = 0.518668 - 0.256927I$ $b = -0.921497 + 0.693070I$	$1.92199 + 1.66881I$	$-4.76442 - 0.86409I$
$u = 0.22163 + 1.63428I$ $a = 0.950847 - 0.342173I$ $b = -3.01495 + 0.10778I$	$6.50636 - 11.34500I$	$-6.41522 + 5.59283I$
$u = 0.22163 - 1.63428I$ $a = 0.950847 + 0.342173I$ $b = -3.01495 - 0.10778I$	$6.50636 + 11.34500I$	$-6.41522 - 5.59283I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.314498$ $a = -1.13389$ $b = 0.244454$	-0.542082	-18.2830
$u = 0.06403 + 1.71455I$ $a = -0.623663 + 0.320565I$ $b = 2.34998 - 0.02921I$	$12.09750 - 2.52656I$	$-9.24277 + 2.75851I$
$u = 0.06403 - 1.71455I$ $a = -0.623663 - 0.320565I$ $b = 2.34998 + 0.02921I$	$12.09750 + 2.52656I$	$-9.24277 - 2.75851I$

II. $I_2^u =$
$\langle -a^3u^3+u^3a+\cdots+a+1,\ -a^3u^3+u^3a^2+\cdots+10a+12,\ u^4+u^3+3u^2+2u+1\rangle$

(i) Arc colorings

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

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

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

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

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

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

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

$$a_3 = \begin{pmatrix} -a^3u^2 - a \\ a^3u^2 + a^2u - 2u^3 - 2u^2 + a - 6u - 2 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -a^3u^3 - 2a^3u^2 - u^3a^2 - a^3u + u^3a + u^2a + 2u^3 + 2au + 4u + 2 \\ 2a^3u^3 + u^3a^2 + \cdots + a^3 - 2a \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^3 - 4u^2 - 12u - 14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_6 c_8	$u^{16} - u^{15} + \cdots - 22u + 31$
c_3	$(u^2 + u - 1)^8$
c_4, c_5, c_9 c_{10}	$(u^4 - u^3 + 3u^2 - 2u + 1)^4$
c_7, c_{11}	$u^{16} + u^{15} + \cdots - 48u + 19$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$y^{16} + 7y^{15} + \cdots + 4104y + 961$
c_3	$(y^2 - 3y + 1)^8$
c_4, c_5, c_9 c_{10}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^4$
c_7, c_{11}	$y^{16} - 9y^{15} + \cdots - 4356y + 361$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.395123 + 0.506844I$ $a = -1.402280 - 0.070449I$ $b = \ \ 1.27211 + 1.05139I$	$-4.15885 + 1.41510I$	$-9.82674 - 4.90874I$
$u = -0.395123 + 0.506844I$ $a = -1.42285 + 0.49823I$ $b = \ \ 0.435184 - 0.843532I$	$3.73684 + 1.41510I$	$-9.82674 - 4.90874I$
$u = -0.395123 + 0.506844I$ $a = \ \ 0.51653 + 1.88406I$ $b = \ \ 0.112797 + 0.286161I$	$-4.15885 + 1.41510I$	$-9.82674 - 4.90874I$
$u = -0.395123 + 0.506844I$ $a = \ \ 1.76118 - 1.19097I$ $b = -0.964169 + 0.332631I$	$3.73684 + 1.41510I$	$-9.82674 - 4.90874I$
$u = -0.395123 - 0.506844I$ $a = -1.402280 + 0.070449I$ $b = \ \ 1.27211 - 1.05139I$	$-4.15885 - 1.41510I$	$-9.82674 + 4.90874I$
$u = -0.395123 - 0.506844I$ $a = -1.42285 - 0.49823I$ $b = \ \ 0.435184 + 0.843532I$	$3.73684 - 1.41510I$	$-9.82674 + 4.90874I$
$u = -0.395123 - 0.506844I$ $a = \ \ 0.51653 - 1.88406I$ $b = \ \ 0.112797 - 0.286161I$	$-4.15885 - 1.41510I$	$-9.82674 + 4.90874I$
$u = -0.395123 - 0.506844I$ $a = \ \ 1.76118 + 1.19097I$ $b = -0.964169 - 0.332631I$	$3.73684 - 1.41510I$	$-9.82674 + 4.90874I$
$u = -0.10488 + 1.55249I$ $a = \ \ 0.206815 - 1.015740I$ $b = -0.64998 + 1.32275I$	$2.84290 + 3.16396I$	$-6.17326 - 2.56480I$
$u = -0.10488 + 1.55249I$ $a = -1.051500 - 0.096749I$ $b = \ \ 3.27820 - 0.48455I$	$10.73860 + 3.16396I$	$-6.17326 - 2.56480I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.10488+1.55249I$ $a=\ \ 0.713168+0.458702I$ $b=-1.82216+0.28952I$	$10.73860+3.16396I$	$-6.17326-2.56480I$
$u=-0.10488+1.55249I$ $a=\ \ 0.678935+0.068135I$ $b=-3.16197-0.81217I$	$2.84290+3.16396I$	$-6.17326-2.56480I$
$u=-0.10488-1.55249I$ $a=\ \ 0.206815+1.015740I$ $b=-0.64998-1.32275I$	$2.84290-3.16396I$	$-6.17326+2.56480I$
$u=-0.10488-1.55249I$ $a=-1.051500+0.096749I$ $b=\ \ 3.27820+0.48455I$	$10.73860-3.16396I$	$-6.17326+2.56480I$
$u=-0.10488-1.55249I$ $a=\ \ 0.713168-0.458702I$ $b=-1.82216-0.28952I$	$10.73860-3.16396I$	$-6.17326+2.56480I$
$u=-0.10488-1.55249I$ $a=\ \ 0.678935-0.068135I$ $b=-3.16197+0.81217I$	$2.84290-3.16396I$	$-6.17326+2.56480I$

III. $\boldsymbol{I_3^u = \langle u^4 + u^3 + 2u^2 + b + 2u,\ u^2 + a + 2,\ u^7 + 5u^5 + 7u^3 + 2u - 1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u^2 - 2 \\ -u^4 - u^3 - 2u^2 - 2u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3 - u^2 - 2u - 2 \\ -u^5 - u^4 - 3u^3 - 2u^2 - 2u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^2 + 1 \\ -u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^6 - 5u^4 - 7u^2 - u - 2 \\ -u^4 - u^3 - 3u^2 - u - 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^5 + 4u^3 + 4u \\ u^6 - u^5 + 4u^4 - 3u^3 + 4u^2 - u + 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u^6 + u^5 + 4u^4 + 4u^3 + 4u^2 + 4u + 1 \\ -u^5 + u^4 - 3u^3 + 3u^2 - u + 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^6 - 2u^5 - 16u^4 - 6u^3 - 15u^2 - 5u - 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$y^7 + 4y^6 + 6y^5 + y^4 - 5y^3 - y^2 + 3y - 1$
c_3	$y^7 - 3y^6 - 3y^5 + 12y^4 + 10y^3 - 29y^2 - 3y - 4$
c_4, c_5, c_9 c_{10}	$y^7 + 10y^6 + 39y^5 + 74y^4 + 69y^3 + 28y^2 + 4y - 1$
c_7, c_{11}	$y^7 - 3y^6 + y^5 + 5y^4 - y^3 - 6y^2 - 4y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.271185+0.674379I$ $a=-1.61875+0.36576I$ $b=\ \ 0.943244-0.738208I$	$4.79738+0.94912I$	$-1.21872-0.82233I$
$u=-0.271185-0.674379I$ $a=-1.61875-0.36576I$ $b=\ \ 0.943244+0.738208I$	$4.79738-0.94912I$	$-1.21872+0.82233I$
$u=\ \ 0.180054+1.394520I$ $a=-0.087725-0.502178I$ $b=\ \ 1.104440+0.703496I$	$0.58425-1.95701I$	$-10.82069+1.34837I$
$u=\ \ 0.180054-1.394520I$ $a=-0.087725+0.502178I$ $b=\ \ 1.104440-0.703496I$	$0.58425+1.95701I$	$-10.82069-1.34837I$
$u=\ \ 0.344493$ $a=-2.11868$ $b=-0.981303$	-4.19405	-9.98960
$u=-0.08112+1.66505I$ $a=\ \ 0.765818+0.270123I$ $b=-2.55703+0.29924I$	$13.16470+2.34118I$	$-0.965786-0.952471I$
$u=-0.08112-1.66505I$ $a=\ \ 0.765818-0.270123I$ $b=-2.55703-0.29924I$	$13.16470-2.34118I$	$-0.965786+0.952471I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_8	$(u^7+2u^5+u^4+u^3+u^2-u-1)(u^{13}+5u^{11}+\cdots+2u+1)$ $\cdot(u^{16}-u^{15}+\cdots-22u+31)$
c_2, c_6	$(u^7+2u^5-u^4+u^3-u^2-u+1)(u^{13}+5u^{11}+\cdots+2u+1)$ $\cdot(u^{16}-u^{15}+\cdots-22u+31)$
c_3	$(u^2+u-1)^8(u^7+3u^6+3u^5+4u^4+6u^3+u^2-u+2)$ $\cdot(u^{13}-12u^{12}+\cdots-16u+16)$
c_4, c_5	$(u^4-u^3+3u^2-2u+1)^4(u^7+5u^5+7u^3+2u-1)$ $\cdot(u^{13}+5u^{12}+\cdots+30u+4)$
c_7, c_{11}	$(u^7-u^6-u^5+u^4-u^3+2u^2+1)(u^{13}+u^{12}+\cdots+3u+1)$ $\cdot(u^{16}+u^{15}+\cdots-48u+19)$
c_9, c_{10}	$(u^4-u^3+3u^2-2u+1)^4(u^7+5u^5+7u^3+2u+1)$ $\cdot(u^{13}+5u^{12}+\cdots+30u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_6 c_8	$(y^7 + 4y^6 + \cdots + 3y - 1)(y^{13} + 10y^{12} + \cdots + 30y^2 - 1)$ $\cdot (y^{16} + 7y^{15} + \cdots + 4104y + 961)$
c_3	$(y^2 - 3y + 1)^8(y^7 - 3y^6 - 3y^5 + 12y^4 + 10y^3 - 29y^2 - 3y - 4)$ $\cdot (y^{13} - 6y^{12} + \cdots + 4480y - 256)$
c_4, c_5, c_9 c_{10}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^4$ $\cdot (y^7 + 10y^6 + 39y^5 + 74y^4 + 69y^3 + 28y^2 + 4y - 1)$ $\cdot (y^{13} + 15y^{12} + \cdots + 124y - 16)$
c_7, c_{11}	$(y^7 - 3y^6 + \cdots - 4y - 1)(y^{13} - 17y^{12} + \cdots + 25y - 1)$ $\cdot (y^{16} - 9y^{15} + \cdots - 4356y + 361)$