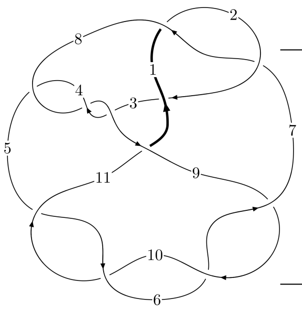
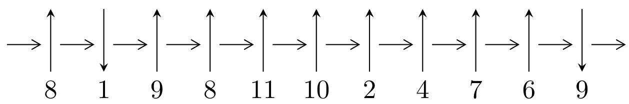
$11n_{140}$ ($K11n_{140}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & -u^{12} + u^{11} - u^{10} + 2u^9 - 6u^8 + 5u^7 - u^6 + 4u^5 - 6u^4 + 4u^3 + 6u^2 + 4b + 1, \\
& -u^{12} + u^{11} - u^{10} + 2u^9 - 6u^8 + 5u^7 - u^6 + 4u^5 - 10u^4 + 4u^3 + 2u^2 + 4a - 3, \\
& u^{13} + 2u^{11} - u^{10} + 6u^9 - u^8 + 6u^7 - 3u^6 + 8u^5 + 4u^3 + u + 1\rangle \\
I_2^u = \langle & 2336u^{15} - 694u^{14} + \cdots + 13139b - 13544,\ -7442u^{15} + 7948u^{14} + \cdots + 65695a + 191727, \\
& u^{16} + u^{15} + \cdots + 4u + 5\rangle \\
I_3^u = \langle & b - a - 1,\ a^2 - au + 2a - u + 2,\ u^2 + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 33 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.

$$\boldsymbol{I_1^u = \langle -u^{12}+u^{11}+\cdots+4b+1,\ -u^{12}+u^{11}+\cdots+4a-3,\ u^{13}+2u^{11}+\cdots+u+1\rangle}$$

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} \frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots - \frac{1}{2}u^2 + \frac{3}{4} \\ \frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots - \frac{3}{2}u^2 - \frac{1}{4} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{2}u^{12} - \frac{1}{2}u^{11} + \cdots - 2u^2 + \frac{1}{2} \\ \frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots - \frac{3}{2}u^2 - \frac{1}{4} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots + \frac{1}{2}u - \frac{1}{4} \\ -\frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots + \frac{1}{2}u - \frac{1}{4} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots + \frac{3}{2}u - \frac{1}{4} \\ -\frac{1}{4}u^{12} - \frac{1}{4}u^{11} + \cdots + \frac{1}{2}u - \frac{1}{4} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{4}u^{12} - \frac{5}{4}u^{11} + \cdots - u - \frac{5}{4} \\ -\frac{1}{2}u^{11} + \frac{1}{2}u^{10} + \cdots - \frac{1}{2}u - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{5}{4}u^{12} - \frac{1}{4}u^{11} + \cdots - \frac{5}{2}u - \frac{3}{4} \\ -u^{12} - \frac{3}{2}u^{10} + \cdots - u - \frac{1}{2} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{5}{4}u^{12} - \frac{1}{4}u^{11} + \cdots - \frac{5}{2}u - \frac{3}{4} \\ -u^{12} - \frac{3}{2}u^{10} + \cdots - u - \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= 3u^{12} - 3u^{11} + 6u^{10} - 9u^9 + 20u^8 - 20u^7 + 19u^6 - 24u^5 + 29u^4 - 20u^3 + 7u^2 - 8u + 6$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$u^{13} + 2u^{11} + u^{10} + 6u^9 + u^8 + 6u^7 + 3u^6 + 8u^5 + 4u^3 + u - 1$
c_2	$u^{13} + 4u^{12} + \cdots + u - 1$
c_5, c_6, c_9 c_{10}	$u^{13} + 3u^{12} + \cdots - 3u - 2$
c_{11}	$u^{13} - 3u^{12} + \cdots + 41u - 24$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$y^{13} + 4y^{12} + \cdots + y - 1$
c_2	$y^{13} + 16y^{12} + \cdots + 17y - 1$
c_5, c_6, c_9 c_{10}	$y^{13} + 15y^{12} + \cdots + 17y - 4$
c_{11}	$y^{13} + 3y^{12} + \cdots + 6385y - 576$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.849803 + 0.688633I$ $a = 0.100600 + 0.370738I$ $b = 0.161020 - 1.380070I$	$-2.33364 + 0.79324I$	$4.73185 - 2.01069I$
$u = 0.849803 - 0.688633I$ $a = 0.100600 - 0.370738I$ $b = 0.161020 + 1.380070I$	$-2.33364 - 0.79324I$	$4.73185 + 2.01069I$
$u = -0.301931 + 0.795374I$ $a = 0.53836 + 1.69819I$ $b = 0.01733 + 1.65836I$	$-11.18850 - 1.28224I$	$2.05046 + 5.61257I$
$u = -0.301931 - 0.795374I$ $a = 0.53836 - 1.69819I$ $b = 0.01733 - 1.65836I$	$-11.18850 + 1.28224I$	$2.05046 - 5.61257I$
$u = -0.793875 + 0.936102I$ $a = -0.703154 - 0.416062I$ $b = 0.691430 + 0.338829I$	$3.03190 - 3.86102I$	$7.31704 + 2.47395I$
$u = -0.793875 - 0.936102I$ $a = -0.703154 + 0.416062I$ $b = 0.691430 - 0.338829I$	$3.03190 + 3.86102I$	$7.31704 - 2.47395I$
$u = 0.426416 + 0.596732I$ $a = 0.581070 - 0.572912I$ $b = -0.016047 - 0.904459I$	$-2.28202 + 1.46619I$	$3.02331 - 4.77758I$
$u = 0.426416 - 0.596732I$ $a = 0.581070 + 0.572912I$ $b = -0.016047 + 0.904459I$	$-2.28202 - 1.46619I$	$3.02331 + 4.77758I$
$u = 0.760740 + 1.064260I$ $a = -1.237650 + 0.471225I$ $b = 0.631392 + 0.645827I$	$2.12458 + 8.30943I$	$4.97203 - 7.67433I$
$u = 0.760740 - 1.064260I$ $a = -1.237650 - 0.471225I$ $b = 0.631392 - 0.645827I$	$2.12458 - 8.30943I$	$4.97203 + 7.67433I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.717554 + 1.160670I$ $a = -1.71256 - 0.47703I$ $b = 0.20153 - 1.58392I$	$-5.31862 - 11.41160I$	$1.59544 + 6.78413I$
$u = -0.717554 - 1.160670I$ $a = -1.71256 + 0.47703I$ $b = 0.20153 + 1.58392I$	$-5.31862 + 11.41160I$	$1.59544 - 6.78413I$
$u = -0.447199$ $a = 0.866672$ $b = -0.373309$	0.678852	14.6200

II. $\boldsymbol{I_2^u = \langle 2336u^{15} - 694u^{14} + \cdots + 13139b - 13544,\ -7442u^{15} + 7948u^{14} + \cdots + 65695a + 191727,\ u^{16} + u^{15} + \cdots + 4u + 5\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.113281u^{15} - 0.120983u^{14} + \cdots - 0.144562u - 2.91844 \\ -0.177791u^{15} + 0.0528198u^{14} + \cdots - 0.306035u + 1.03082 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.0645102u^{15} - 0.0681635u^{14} + \cdots - 0.450597u - 1.88762 \\ -0.177791u^{15} + 0.0528198u^{14} + \cdots - 0.306035u + 1.03082 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.440429u^{15} + 0.374290u^{14} + \cdots + 5.23398u + 1.69710 \\ -0.246594u^{15} - 0.358246u^{14} + \cdots - 0.496385u - 1.22780 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{1}{5}u^{15} + \frac{1}{5}u^{14} + \cdots + \frac{14}{5}u + \frac{4}{5} \\ -0.240429u^{15} - 0.174290u^{14} + \cdots - 1.43398u - 0.897100 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0488926u^{15} - 0.264525u^{14} + \cdots - 0.240840u - 0.483477 \\ -0.287236u^{15} - 0.200624u^{14} + \cdots - 0.500419u - 0.889413 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.206165u^{15} + 0.383956u^{14} + \cdots + 0.862410u + 1.13069 \\ -0.0159830u^{15} - 0.106553u^{14} + \cdots + 1.24560u - 0.338839 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.206165u^{15} + 0.383956u^{14} + \cdots + 0.862410u + 1.13069 \\ -0.0159830u^{15} - 0.106553u^{14} + \cdots + 1.24560u - 0.338839 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{488}{1877}u^{15} - \frac{1752}{1877}u^{14} + \cdots - \frac{16008}{1877}u - \frac{9926}{1877}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$u^{16} - u^{15} + \cdots - 4u + 5$
c_2	$u^{16} + 7u^{15} + \cdots + 124u + 25$
c_5, c_6, c_9 c_{10}, c_{11}	$(u^8 - u^7 + 5u^6 - 4u^5 + 7u^4 - 4u^3 + 2u^2 + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$y^{16} + 7y^{15} + \cdots + 124y + 25$
c_2	$y^{16} + 3y^{15} + \cdots + 824y + 625$
c_5, c_6, c_9 c_{10}, c_{11}	$(y^8 + 9y^7 + 31y^6 + 50y^5 + 39y^4 + 22y^3 + 18y^2 + 4y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.548614 + 0.832668I$ $a = -1.83759 + 1.08227I$ $b = 0.06382 - 1.51723I$	$-9.89946 - 2.18536I$	$0.41681 + 3.14055I$
$u = -0.548614 - 0.832668I$ $a = -1.83759 - 1.08227I$ $b = 0.06382 + 1.51723I$	$-9.89946 + 2.18536I$	$0.41681 - 3.14055I$
$u = -0.969644 + 0.496042I$ $a = 0.353364 + 0.413115I$ $b = -0.19980 - 1.51366I$	$-3.28987 + 5.23868I$	$4.00000 - 3.04258I$
$u = -0.969644 - 0.496042I$ $a = 0.353364 - 0.413115I$ $b = -0.19980 + 1.51366I$	$-3.28987 - 5.23868I$	$4.00000 + 3.04258I$
$u = 0.886697 + 0.673651I$ $a = 0.835367 - 0.338086I$ $b = -0.647085 + 0.502738I$	$3.31972 - 2.18536I$	$7.58319 + 3.14055I$
$u = 0.886697 - 0.673651I$ $a = 0.835367 + 0.338086I$ $b = -0.647085 - 0.502738I$	$3.31972 + 2.18536I$	$7.58319 - 3.14055I$
$u = -0.822874 + 0.843581I$ $a = 1.216240 + 0.256877I$ $b = -0.647085 + 0.502738I$	$3.31972 - 2.18536I$	$7.58319 + 3.14055I$
$u = -0.822874 - 0.843581I$ $a = 1.216240 - 0.256877I$ $b = -0.647085 - 0.502738I$	$3.31972 + 2.18536I$	$7.58319 - 3.14055I$
$u = 0.043421 + 1.182100I$ $a = -0.104055 - 0.579236I$ $b = 0.283060 - 0.443755I$	$-3.28987 - 1.04600I$	$4.00000 + 6.68545I$
$u = 0.043421 - 1.182100I$ $a = -0.104055 + 0.579236I$ $b = 0.283060 + 0.443755I$	$-3.28987 + 1.04600I$	$4.00000 - 6.68545I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.239639 + 0.738346I$ $a = -1.82664 - 0.62597I$ $b = 0.283060 + 0.443755I$	$-3.28987 + 1.04600I$	$4.00000 - 6.68545I$
$u = 0.239639 - 0.738346I$ $a = -1.82664 + 0.62597I$ $b = 0.283060 - 0.443755I$	$-3.28987 - 1.04600I$	$4.00000 + 6.68545I$
$u = 0.769845 + 1.017620I$ $a = 1.54571 - 0.12141I$ $b = -0.19980 - 1.51366I$	$-3.28987 + 5.23868I$	$4.00000 - 3.04258I$
$u = 0.769845 - 1.017620I$ $a = 1.54571 + 0.12141I$ $b = -0.19980 + 1.51366I$	$-3.28987 - 5.23868I$	$4.00000 + 3.04258I$
$u = -0.098471 + 1.335410I$ $a = 0.017611 + 1.367960I$ $b = 0.06382 + 1.51723I$	$-9.89946 + 2.18536I$	$0.41681 - 3.14055I$
$u = -0.098471 - 1.335410I$ $a = 0.017611 - 1.367960I$ $b = 0.06382 - 1.51723I$	$-9.89946 - 2.18536I$	$0.41681 + 3.14055I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = -1.000000 - 0.618034I$ $b = -0.618034I$	-4.27683	-4.00000
$u = 1.000000I$ $a = -1.00000 + 1.61803I$ $b = 1.61803I$	-12.1725	-4.00000
$u = -1.000000I$ $a = -1.000000 + 0.618034I$ $b = 0.618034I$	-4.27683	-4.00000
$u = -1.000000I$ $a = -1.00000 - 1.61803I$ $b = -1.61803I$	-12.1725	-4.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$(u^2+1)^2(u^{13}+2u^{11}+u^{10}+6u^9+u^8+6u^7+3u^6+8u^5+4u^3+u-1)$ $\cdot\,(u^{16}-u^{15}+\cdots-4u+5)$
c_2	$((u+1)^4)(u^{13}+4u^{12}+\cdots+u-1)(u^{16}+7u^{15}+\cdots+124u+25)$
c_5, c_6, c_9 c_{10}	$(u^4+3u^2+1)(u^8-u^7+5u^6-4u^5+7u^4-4u^3+2u^2+1)^2$ $\cdot\,(u^{13}+3u^{12}+\cdots-3u-2)$
c_{11}	$(u^2-u-1)^2(u^8-u^7+5u^6-4u^5+7u^4-4u^3+2u^2+1)^2$ $\cdot\,(u^{13}-3u^{12}+\cdots+41u-24)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$((y+1)^4)(y^{13}+4y^{12}+\cdots+y-1)(y^{16}+7y^{15}+\cdots+124y+25)$
c_2	$((y-1)^4)(y^{13}+16y^{12}+\cdots+17y-1)(y^{16}+3y^{15}+\cdots+824y+625)$
c_5, c_6, c_9 c_{10}	$(y^2+3y+1)^2$ $\cdot(y^8+9y^7+31y^6+50y^5+39y^4+22y^3+18y^2+4y+1)^2$ $\cdot(y^{13}+15y^{12}+\cdots+17y-4)$
c_{11}	$(y^2-3y+1)^2$ $\cdot(y^8+9y^7+31y^6+50y^5+39y^4+22y^3+18y^2+4y+1)^2$ $\cdot(y^{13}+3y^{12}+\cdots+6385y-576)$