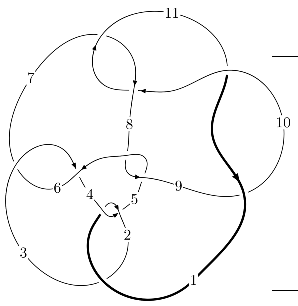
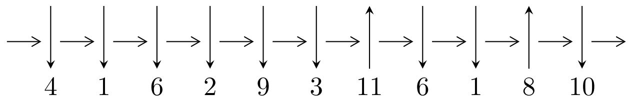
$11n_{31}$ $(K11n_{31})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle & 7u^{10} - 8u^9 - 23u^8 + 57u^7 - 2u^6 + 8u^5 - 87u^4 + 232u^3 + 3u^2 + 164b + 47u - 106, \\ & 38u^{10} - 184u^9 + 414u^8 - 493u^7 + 446u^6 - 513u^5 + 828u^4 - 650u^3 + 397u^2 + 82a - 395u + 350, \\ & u^{11} - 5u^{10} + 12u^9 - 16u^8 + 16u^7 - 17u^6 + 25u^5 - 21u^4 + 14u^3 - 10u^2 + 10u - 1\rangle \\ I_2^u = \langle & -a^2u - 2au + b - a + u,\ a^3 - a^2u + 2a^2 - au - a + u - 2,\ u^2 + u + 1\rangle \\ I_3^u = \langle & b,\ -u^3 + 2u^2 + a - 2u,\ u^4 - u^3 + u^2 + 1\rangle \end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 21 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. $I^u_1 = \langle 7u^{10} - 8u^9 + \cdots + 164b - 106,\ 38u^{10} - 184u^9 + \cdots + 82a + 350,\ u^{11} - 5u^{10} + \cdots + 10u - 1\rangle$

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} -0.463415u^{10} + 2.24390u^9 + \cdots + 4.81707u - 4.26829 \\ -0.0426829u^{10} + 0.0487805u^9 + \cdots - 0.286585u + 0.646341 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 0.359756u^{10} - 1.76829u^9 + \cdots - 3.79878u + 3.69512 \\ 0.0121951u^{10} + 0.164634u^9 + \cdots + 1.18902u - 0.506098 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.871951u^{10} + 3.85366u^9 + \cdots + 6.35976u - 6.43902 \\ 0.884146u^{10} - 3.68902u^9 + \cdots - 5.67073u + 1.43293 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.152439u^{10} + 1.31707u^9 + \cdots + 2.76220u - 4.04878 \\ -1.23780u^{10} + 5.41463u^9 + \cdots + 8.68902u - 0.256098 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.201220u^{10} + 1.15854u^9 + \cdots + 2.00610u - 3.52439 \\ -0.195122u^{10} + 3.11585u^9 + \cdots + 5.22561u - 0.152439 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^5 - u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^5 - u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= -\frac{69}{82}u^{10} + \frac{319}{82}u^9 - \frac{364}{41}u^8 + \frac{460}{41}u^7 - \frac{935}{82}u^6 + \frac{476}{41}u^5 - \frac{687}{41}u^4 + \frac{520}{41}u^3 - \frac{539}{41}u^2 + \frac{673}{82}u - \frac{444}{41}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^{11} - 7u^{10} + \cdots - 9u + 1$
c_2	$u^{11} + 11u^{10} + \cdots + 5u + 1$
c_3, c_6	$u^{11} - 6u^{10} + \cdots - 24u + 16$
c_5, c_8	$u^{11} - 2u^{10} + \cdots + 96u + 64$
c_7, c_{10}	$u^{11} + 5u^{10} + \cdots + 10u + 1$
c_9, c_{11}	$u^{11} - u^{10} + \cdots + 80u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^{11} - 11y^{10} + \cdots + 5y - 1$
c_2	$y^{11} + 113y^{10} + \cdots - 3895y - 1$
c_3, c_6	$y^{11} + 30y^{10} + \cdots - 2240y - 256$
c_5, c_8	$y^{11} + 52y^{10} + \cdots + 33792y - 4096$
c_7, c_{10}	$y^{11} - y^{10} + \cdots + 80y - 1$
c_9, c_{11}	$y^{11} + 31y^{10} + \cdots + 6676y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.685415 + 0.773477I$ $a = -0.73400 + 2.17133I$ $b = -0.460151 - 0.697009I$	$-1.32886 - 1.52951I$	$-7.26885 + 4.94950I$
$u = -0.685415 - 0.773477I$ $a = -0.73400 - 2.17133I$ $b = -0.460151 + 0.697009I$	$-1.32886 + 1.52951I$	$-7.26885 - 4.94950I$
$u = 0.855917 + 0.653801I$ $a = 0.594255 + 0.858681I$ $b = 0.710923 - 1.191110I$	$4.33457 + 4.30583I$	$-3.61862 - 3.76799I$
$u = 0.855917 - 0.653801I$ $a = 0.594255 - 0.858681I$ $b = 0.710923 + 1.191110I$	$4.33457 - 4.30583I$	$-3.61862 + 3.76799I$
$u = -0.315247 + 0.806810I$ $a = -0.545836 + 0.331424I$ $b = -0.143998 + 0.360224I$	$-0.33628 - 1.50726I$	$-2.98443 + 4.38710I$
$u = -0.315247 - 0.806810I$ $a = -0.545836 - 0.331424I$ $b = -0.143998 - 0.360224I$	$-0.33628 + 1.50726I$	$-2.98443 - 4.38710I$
$u = 0.94424 + 1.31822I$ $a = -1.30445 - 1.00484I$ $b = -1.48748 + 2.15268I$	$-18.0782 + 10.5314I$	$-5.95863 - 4.05407I$
$u = 0.94424 - 1.31822I$ $a = -1.30445 + 1.00484I$ $b = -1.48748 - 2.15268I$	$-18.0782 - 10.5314I$	$-5.95863 + 4.05407I$
$u = 0.110617$ $a = -3.78537$ $b = 0.612580$	-1.00288	-10.0670
$u = 1.64519 + 0.99588I$ $a = 0.882711 + 0.513382I$ $b = -1.92558 - 3.89584I$	$-16.1660 - 1.6365I$	$-5.13576 + 0.13357I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.64519 - 0.99588I$ $a = 0.882711 - 0.513382I$ $b = -1.92558 + 3.89584I$	$-16.1660 + 1.6365I$	$-5.13576 - 0.13357I$

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

(i) Arc colorings

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

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

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

$$a_8 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

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

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

$$a_{10} = \begin{pmatrix} -u \\ u + 1 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} a^2u + au + a - 3u \\ -a^2 + au + 3 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4a^2 - 2au - a - 1$

(iv) u-Polynomials at the component

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

(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, c_3, c_6	$(y^3 + 3y^2 + 2y - 1)^2$
c_5, c_8	y^6
c_7, c_9, c_{10} c_{11}	$(y^2 + y + 1)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.500000+0.866025I$ $a=0.901916+0.094973I$ $b=-0.215080+1.307140I$	$3.02413+0.79824I$	$-4.05323-2.24743I$
$u=-0.500000+0.866025I$ $a=-1.362120+0.277556I$ $b=-0.215080-1.307140I$	$3.02413-4.85801I$	$-7.63258+5.38377I$
$u=-0.500000+0.866025I$ $a=-2.03980+0.49350I$ $b=-0.569840$	$-1.11345-2.02988I$	$-15.8142+11.5861I$
$u=-0.500000-0.866025I$ $a=0.901916-0.094973I$ $b=-0.215080-1.307140I$	$3.02413-0.79824I$	$-4.05323+2.24743I$
$u=-0.500000-0.866025I$ $a=-1.362120-0.277556I$ $b=-0.215080+1.307140I$	$3.02413+4.85801I$	$-7.63258-5.38377I$
$u=-0.500000-0.866025I$ $a=-2.03980-0.49350I$ $b=-0.569840$	$-1.11345+2.02988I$	$-15.8142-11.5861I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3u^3 - 3u^2 + 8u - 12$

(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_6	u^4
c_5, c_9	$u^4 - u^3 + 3u^2 - 2u + 1$
c_7	$u^4 - u^3 + u^2 + 1$
c_8, c_{11}	$u^4 + u^3 + 3u^2 + 2u + 1$
c_{10}	$u^4 + u^3 + u^2 + 1$

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351808 + 0.720342I$ $a = 0.59074 + 2.34806I$ $b = 0$	$-1.85594 - 1.41510I$	$-15.1414 + 7.6022I$
$u = -0.351808 - 0.720342I$ $a = 0.59074 - 2.34806I$ $b = 0$	$-1.85594 + 1.41510I$	$-15.1414 - 7.6022I$
$u = 0.851808 + 0.911292I$ $a = 0.409261 - 0.055548I$ $b = 0$	$5.14581 + 3.16396I$	$-0.358581 - 1.047693I$
$u = 0.851808 - 0.911292I$ $a = 0.409261 + 0.055548I$ $b = 0$	$5.14581 - 3.16396I$	$-0.358581 + 1.047693I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^4)(u^3+u^2-1)^2(u^{11}-7u^{10}+\cdots-9u+1)$
c_2	$((u+1)^4)(u^3+u^2+2u+1)^2(u^{11}+11u^{10}+\cdots+5u+1)$
c_3	$u^4(u^3-u^2+2u-1)^2(u^{11}-6u^{10}+\cdots-24u+16)$
c_4	$((u+1)^4)(u^3-u^2+1)^2(u^{11}-7u^{10}+\cdots-9u+1)$
c_5	$u^6(u^4-u^3+3u^2-2u+1)(u^{11}-2u^{10}+\cdots+96u+64)$
c_6	$u^4(u^3+u^2+2u+1)^2(u^{11}-6u^{10}+\cdots-24u+16)$
c_7	$((u^2+u+1)^3)(u^4-u^3+u^2+1)(u^{11}+5u^{10}+\cdots+10u+1)$
c_8	$u^6(u^4+u^3+3u^2+2u+1)(u^{11}-2u^{10}+\cdots+96u+64)$
c_9	$((u^2-u+1)^3)(u^4-u^3+3u^2-2u+1)(u^{11}-u^{10}+\cdots+80u-1)$
c_{10}	$((u^2-u+1)^3)(u^4+u^3+u^2+1)(u^{11}+5u^{10}+\cdots+10u+1)$
c_{11}	$((u^2+u+1)^3)(u^4+u^3+3u^2+2u+1)(u^{11}-u^{10}+\cdots+80u-1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4	$((y-1)^4)(y^3-y^2+2y-1)^2(y^{11}-11y^{10}+\cdots+5y-1)$
c_2	$((y-1)^4)(y^3+3y^2+2y-1)^2(y^{11}+113y^{10}+\cdots-3895y-1)$
c_3, c_6	$y^4(y^3+3y^2+2y-1)^2(y^{11}+30y^{10}+\cdots-2240y-256)$
c_5, c_8	$y^6(y^4+5y^3+\cdots+2y+1)(y^{11}+52y^{10}+\cdots+33792y-4096)$
c_7, c_{10}	$((y^2+y+1)^3)(y^4+y^3+3y^2+2y+1)(y^{11}-y^{10}+\cdots+80y-1)$
c_9, c_{11}	$((y^2+y+1)^3)(y^4+5y^3+\cdots+2y+1)(y^{11}+31y^{10}+\cdots+6676y-1)$