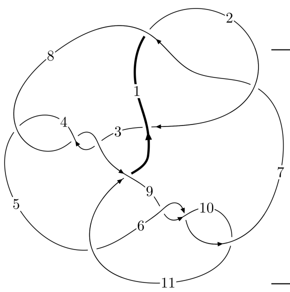
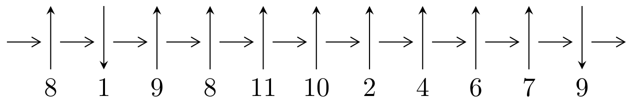
$11n_{137}$ $(K11n_{137})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & -u^{15} - u^{14} + 6u^{13} + 4u^{12} - 15u^{11} - 3u^{10} + 19u^9 - 7u^8 - 10u^7 + 12u^6 - 2u^5 - 3u^4 + 4u^3 - 2u^2 + b + 1, \\
& u^{15} + u^{14} - 5u^{13} - 4u^{12} + 9u^{11} + 4u^{10} - 6u^9 + 2u^8 - u^7 - 4u^6 + 4u^5 - 4u^3 + 2a + u - 1, \\
& u^{16} + 3u^{15} + \cdots - 3u - 2\rangle \\
I_2^u = \langle & -4u^8a + 6u^8 + \cdots - 3a + 4, \\
& -2u^8a + 8u^6a + 2u^7 + 2u^5a + u^6 - 9u^4a - 7u^5 - 6u^3a - 5u^4 + u^2a + 6u^3 + a^2 + 4au + 7u^2 - a + 2u - 2, \\
& u^9 - u^8 - 4u^7 + 3u^6 + 5u^5 - u^4 - 2u^3 - 2u^2 + u - 1\rangle \\
I_3^u = \langle & u^5 - 2u^3 + b + u,\ u^5 - 3u^3 - u^2 + a + 2u + 1,\ u^6 - 3u^4 + 2u^2 + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 40 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.

$\boldsymbol{I_1^u = \langle -u^{15} - u^{14} + \cdots + b + 1,\ u^{15} + u^{14} + \cdots + 2a - 1,\ u^{16} + 3u^{15} + \cdots - 3u - 2 \rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -\frac{1}{2}u^{15} - \frac{1}{2}u^{14} + \cdots - \frac{1}{2}u + \frac{1}{2} \\ u^{15} + u^{14} + \cdots + 2u^2 - 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{3}{2}u^{15} - \frac{3}{2}u^{14} + \cdots - \frac{1}{2}u + \frac{3}{2} \\ u^{15} + u^{14} + \cdots + 2u^2 - 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u^{15} + \frac{1}{2}u^{14} + \cdots - \frac{1}{2}u + \frac{1}{2} \\ -u^{15} - u^{14} + \cdots + u + 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{3}{2}u^{15} + \frac{5}{2}u^{14} + \cdots - \frac{5}{2}u - \frac{3}{2} \\ -u^{15} - 2u^{14} + \cdots - 2u^2 + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{3}{2}u^{15} + \frac{5}{2}u^{14} + \cdots - \frac{5}{2}u - \frac{3}{2} \\ -u^{15} - 2u^{14} + \cdots - 2u^2 + 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^{15} + 6u^{14} - 20u^{13} - 22u^{12} + 42u^{11} + 12u^{10} - 44u^9 + 42u^8 + 4u^7 - 54u^6 + 40u^5 - 6u^4 - 28u^3 + 20u^2 - 12u + 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$u^{16} + 2u^{14} + \cdots + 2u - 1$
c_2	$u^{16} + 4u^{15} + \cdots - 14u^2 + 1$
c_5	$u^{16} + 9u^{15} + \cdots + 31u + 22$
c_6, c_9, c_{10}	$u^{16} - 3u^{15} + \cdots + 3u - 2$
c_{11}	$u^{16} - 3u^{15} + \cdots - 41u - 8$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$y^{16} + 4y^{15} + \cdots - 14y^2 + 1$
c_2	$y^{16} + 24y^{15} + \cdots - 28y + 1$
c_5	$y^{16} - 3y^{15} + \cdots - 3557y + 484$
c_6, c_9, c_{10}	$y^{16} - 15y^{15} + \cdots - 21y + 4$
c_{11}	$y^{16} + 9y^{15} + \cdots - 6561y + 64$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.608375 + 0.583971I$ $a = 0.147239 - 0.217444I$ $b = -0.826528 + 0.979522I$	$3.36394 - 4.13872I$	$7.73528 + 1.97260I$
$u = 0.608375 - 0.583971I$ $a = 0.147239 + 0.217444I$ $b = -0.826528 - 0.979522I$	$3.36394 + 4.13872I$	$7.73528 - 1.97260I$
$u = 0.395219 + 0.742683I$ $a = -1.25592 + 1.19798I$ $b = 0.797243 + 1.086110I$	$2.59863 + 8.63192I$	$5.90792 - 7.27043I$
$u = 0.395219 - 0.742683I$ $a = -1.25592 - 1.19798I$ $b = 0.797243 - 1.086110I$	$2.59863 - 8.63192I$	$5.90792 + 7.27043I$
$u = 1.216880 + 0.292072I$ $a = 0.840694 - 0.714472I$ $b = -0.494247 - 0.784033I$	$0.99780 + 5.12268I$	$7.85223 - 7.82309I$
$u = 1.216880 - 0.292072I$ $a = 0.840694 + 0.714472I$ $b = -0.494247 + 0.784033I$	$0.99780 - 5.12268I$	$7.85223 + 7.82309I$
$u = 0.012792 + 0.713635I$ $a = 0.244689 - 1.197750I$ $b = 0.379775 - 0.677130I$	$-2.70658 - 1.45405I$	$3.73411 + 4.71917I$
$u = 0.012792 - 0.713635I$ $a = 0.244689 + 1.197750I$ $b = 0.379775 + 0.677130I$	$-2.70658 + 1.45405I$	$3.73411 - 4.71917I$
$u = -1.271500 + 0.260922I$ $a = -0.319754 - 0.233539I$ $b = -0.232716 - 0.644221I$	$1.24387 - 2.05073I$	$9.21244 - 1.11358I$
$u = -1.271500 - 0.260922I$ $a = -0.319754 + 0.233539I$ $b = -0.232716 + 0.644221I$	$1.24387 + 2.05073I$	$9.21244 + 1.11358I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.43214$ $a = -1.38066$ $b = 0.888414$	6.54271	14.4520
$u = -1.47068 + 0.28044I$ $a = 2.09438 + 0.18309I$ $b = -0.82217 + 1.15830I$	$8.6109 - 12.3641I$	$9.35094 + 7.14528I$
$u = -1.47068 - 0.28044I$ $a = 2.09438 - 0.18309I$ $b = -0.82217 - 1.15830I$	$8.6109 + 12.3641I$	$9.35094 - 7.14528I$
$u = -1.50706 + 0.17257I$ $a = -1.11020 - 1.03847I$ $b = 0.966111 + 0.941274I$	$10.25570 + 1.47993I$	$11.45831 - 1.74331I$
$u = -1.50706 - 0.17257I$ $a = -1.11020 + 1.03847I$ $b = 0.966111 - 0.941274I$	$10.25570 - 1.47993I$	$11.45831 + 1.74331I$
$u = -0.400197$ $a = 0.598381$ $b = -0.423356$	0.656537	15.0460

II.

$$\boldsymbol{I_2^u = \langle -4u^8a+6u^8+\cdots-3a+4,\ -2u^8a+2u^7+\cdots-a-2,\ u^9-u^8+\cdots+u-1\rangle}$$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -u^2+1 \\ u^4-2u^2 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} a \\ 4u^8a-6u^8+\cdots+3a-4 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -4u^8a+6u^8+\cdots-2a+4 \\ 4u^8a-6u^8+\cdots+3a-4 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -3u^8a+6u^8+\cdots-2a+5 \\ 5u^8a-8u^8+\cdots+4a-6 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^5+2u^3-u \\ u^7-3u^5+2u^3+u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 6u^8a-9u^8+\cdots+4a-7 \\ -2u^8a+3u^8+\cdots-2a+2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 6u^8a-9u^8+\cdots+4a-7 \\ -2u^8a+3u^8+\cdots-2a+2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^6+12u^4+4u^3-8u^2-8u+6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$u^{18} - u^{17} + \cdots - 8u + 5$
c_2	$u^{18} + 7u^{17} + \cdots + 136u + 25$
c_5	$(u^9 - 3u^8 + 2u^7 + 5u^6 - u^5 - 13u^4 + 10u^3 + 2u^2 + u - 3)^2$
c_6, c_9, c_{10}	$(u^9 + u^8 - 4u^7 - 3u^6 + 5u^5 + u^4 - 2u^3 + 2u^2 + u + 1)^2$
c_{11}	$(u^9 - u^8 + 6u^7 - 5u^6 + 11u^5 - 7u^4 + 6u^3 - 2u^2 + u - 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$y^{18} + 7y^{17} + \cdots + 136y + 25$
c_2	$y^{18} + 7y^{17} + \cdots + 5004y + 625$
c_5	$(y^9 - 5y^8 + 32y^7 - 87y^6 + 185y^5 - 223y^4 + 180y^3 - 62y^2 + 13y - 9)^2$
c_6, c_9, c_{10}	$(y^9 - 9y^8 + 32y^7 - 55y^6 + 45y^5 - 19y^4 + 16y^3 - 10y^2 - 3y - 1)^2$
c_{11}	$(y^9 + 11y^8 + 48y^7 + 105y^6 + 121y^5 + 73y^4 + 20y^3 - 6y^2 - 3y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.482242 + 0.666986I$ $a = 1.119660 + 0.834506I$ $b = -0.881705 + 0.851729I$	$3.77376 - 2.21388I$	$8.24115 + 3.04598I$
$u = -0.482242 + 0.666986I$ $a = -0.009091 - 0.470353I$ $b = 0.937576 + 0.708026I$	$3.77376 - 2.21388I$	$8.24115 + 3.04598I$
$u = -0.482242 - 0.666986I$ $a = 1.119660 - 0.834506I$ $b = -0.881705 - 0.851729I$	$3.77376 + 2.21388I$	$8.24115 - 3.04598I$
$u = -0.482242 - 0.666986I$ $a = -0.009091 + 0.470353I$ $b = 0.937576 - 0.708026I$	$3.77376 + 2.21388I$	$8.24115 - 3.04598I$
$u = 1.28056$ $a = 1.66854 + 0.09359I$ $b = -0.295309 + 1.123220I$	-0.453072	5.66670
$u = 1.28056$ $a = 1.66854 - 0.09359I$ $b = -0.295309 - 1.123220I$	-0.453072	5.66670
$u = -1.380230 + 0.162431I$ $a = -0.931046 + 0.163673I$ $b = 0.076831 - 1.264200I$	$1.87293 - 3.41073I$	$9.88238 + 4.39642I$
$u = -1.380230 + 0.162431I$ $a = 1.54746 - 0.88517I$ $b = -0.505863 + 0.476260I$	$1.87293 - 3.41073I$	$9.88238 + 4.39642I$
$u = -1.380230 - 0.162431I$ $a = -0.931046 - 0.163673I$ $b = 0.076831 + 1.264200I$	$1.87293 + 3.41073I$	$9.88238 - 4.39642I$
$u = -1.380230 - 0.162431I$ $a = 1.54746 + 0.88517I$ $b = -0.505863 - 0.476260I$	$1.87293 + 3.41073I$	$9.88238 - 4.39642I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.230908 + 0.456719I$ $a = -1.90677 - 0.85951I$ $b = 0.257033 + 0.703723I$	$-3.25448 + 1.10969I$	$4.55374 - 6.23947I$
$u = 0.230908 + 0.456719I$ $a = 0.96790 - 1.89385I$ $b = 0.033137 - 1.191070I$	$-3.25448 + 1.10969I$	$4.55374 - 6.23947I$
$u = 0.230908 - 0.456719I$ $a = -1.90677 + 0.85951I$ $b = 0.257033 - 0.703723I$	$-3.25448 - 1.10969I$	$4.55374 + 6.23947I$
$u = 0.230908 - 0.456719I$ $a = 0.96790 + 1.89385I$ $b = 0.033137 + 1.191070I$	$-3.25448 - 1.10969I$	$4.55374 + 6.23947I$
$u = 1.49128 + 0.23430I$ $a = 1.01299 - 1.10233I$ $b = -1.067290 + 0.668745I$	$10.17130 + 5.50049I$	$11.48937 - 2.97298I$
$u = 1.49128 + 0.23430I$ $a = -1.96964 - 0.01296I$ $b = 0.945590 + 0.965095I$	$10.17130 + 5.50049I$	$11.48937 - 2.97298I$
$u = 1.49128 - 0.23430I$ $a = 1.01299 + 1.10233I$ $b = -1.067290 - 0.668745I$	$10.17130 - 5.50049I$	$11.48937 + 2.97298I$
$u = 1.49128 - 0.23430I$ $a = -1.96964 + 0.01296I$ $b = 0.945590 - 0.965095I$	$10.17130 - 5.50049I$	$11.48937 + 2.97298I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^4 + 8u^2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I^u_3	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.307140 + 0.215080I$ $a = 1.40722 + 0.43972I$ $b = -1.000000I$	$-0.26574 + 2.82812I$	$3.50976 - 2.97945I$
$u = 1.307140 - 0.215080I$ $a = 1.40722 - 0.43972I$ $b = 1.000000I$	$-0.26574 - 2.82812I$	$3.50976 + 2.97945I$
$u = -1.307140 + 0.215080I$ $a = -0.082503 - 0.684841I$ $b = -1.000000I$	$-0.26574 - 2.82812I$	$3.50976 + 2.97945I$
$u = -1.307140 - 0.215080I$ $a = -0.082503 + 0.684841I$ $b = 1.000000I$	$-0.26574 + 2.82812I$	$3.50976 - 2.97945I$
$u = 0.569840I$ $a = -1.32472 - 1.75488I$ $b = -1.000000I$	-4.40332	-3.01950
$u = -0.569840I$ $a = -1.32472 + 1.75488I$ $b = 1.000000I$	-4.40332	-3.01950

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$((u^2+1)^3)(u^{16}+2u^{14}+\cdots+2u-1)(u^{18}-u^{17}+\cdots-8u+5)$
c_2	$((u+1)^6)(u^{16}+4u^{15}+\cdots-14u^2+1)(u^{18}+7u^{17}+\cdots+136u+25)$
c_5	$(u^6+u^4+2u^2+1)$ $\cdot(u^9-3u^8+2u^7+5u^6-u^5-13u^4+10u^3+2u^2+u-3)^2$ $\cdot(u^{16}+9u^{15}+\cdots+31u+22)$
c_6, c_9, c_{10}	$(u^6-3u^4+2u^2+1)$ $\cdot(u^9+u^8-4u^7-3u^6+5u^5+u^4-2u^3+2u^2+u+1)^2$ $\cdot(u^{16}-3u^{15}+\cdots+3u-2)$
c_{11}	$((u^3-u^2+1)^2)(u^9-u^8+\cdots+u-1)^2$ $\cdot(u^{16}-3u^{15}+\cdots-41u-8)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$((y+1)^6)(y^{16}+4y^{15}+\cdots-14y^2+1)(y^{18}+7y^{17}+\cdots+136y+25)$
c_2	$((y-1)^6)(y^{16}+24y^{15}+\cdots-28y+1)(y^{18}+7y^{17}+\cdots+5004y+625)$
c_5	$(y^3+y^2+2y+1)^2$ $\cdot(y^9-5y^8+32y^7-87y^6+185y^5-223y^4+180y^3-62y^2+13y-9)^2$ $\cdot(y^{16}-3y^{15}+\cdots-3557y+484)$
c_6, c_9, c_{10}	$(y^3-3y^2+2y+1)^2$ $\cdot(y^9-9y^8+32y^7-55y^6+45y^5-19y^4+16y^3-10y^2-3y-1)^2$ $\cdot(y^{16}-15y^{15}+\cdots-21y+4)$
c_{11}	$(y^3-y^2+2y-1)^2$ $\cdot(y^9+11y^8+48y^7+105y^6+121y^5+73y^4+20y^3-6y^2-3y-1)^2$ $\cdot(y^{16}+9y^{15}+\cdots-6561y+64)$