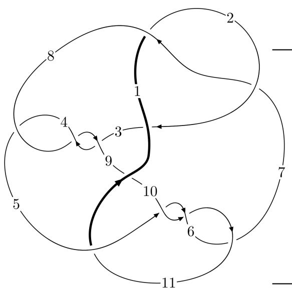
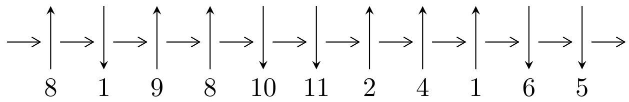
$11n_{138}$ $(K11n_{138})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -u^8 - u^7 - 8u^6 - 5u^5 - 12u^4 - 3u^3 + 20u^2 + 8b + u + 1,\ a - 1, \\
&\quad u^9 + 9u^7 - 3u^6 + 23u^5 - 15u^4 + 7u^3 - 5u^2 - 1 \rangle \\
I_2^u &= \langle b^3 + b^2u - 3b^2 - 2bu + 3b + 2u - 1,\ a + 1,\ u^2 + 1 \rangle \\
I_3^u &= \langle b - 1,\ u^3 + 6u^2 + 15a + 4u + 20,\ u^4 + u^3 + 4u^2 + 5 \rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 19 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.

$$I_1^u = \langle -u^8 - u^7 + \cdots + 8b + 1,\ a - 1,\ u^9 + 9u^7 - 3u^6 + 23u^5 - 15u^4 + 7u^3 - 5u^2 - 1 \rangle$$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ \frac{1}{8}u^8 + \frac{1}{8}u^7 + \cdots - \frac{1}{8}u - \frac{1}{8} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ \frac{1}{8}u^8 + \frac{1}{8}u^7 + \cdots - \frac{1}{8}u - \frac{1}{8} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ \frac{1}{8}u^8 - \frac{1}{8}u^7 + \cdots + \frac{7}{8}u + \frac{1}{8} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{8}u^8 - \frac{1}{8}u^7 + \cdots + \frac{15}{8}u + \frac{1}{8} \\ \frac{1}{8}u^8 - \frac{1}{8}u^7 + \cdots + \frac{7}{8}u + \frac{1}{8} \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} -\frac{1}{8}u^8 - \frac{1}{8}u^7 + \cdots + \frac{1}{8}u + \frac{9}{8} \\ -\frac{3}{8}u^8 - \frac{3}{8}u^7 + \cdots + \frac{5}{8}u + \frac{5}{8} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{8}u^8 + \frac{3}{8}u^7 + \cdots - \frac{7}{8}u - \frac{1}{8} \\ \frac{1}{8}u^8 + \frac{3}{8}u^7 + \cdots - \frac{5}{8}u - \frac{7}{8} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{8}u^8 + \frac{3}{8}u^7 + \cdots - \frac{7}{8}u - \frac{1}{8} \\ \frac{1}{8}u^8 + \frac{3}{8}u^7 + \cdots - \frac{5}{8}u - \frac{7}{8} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{3}{2}u^8 + 2u^7 - \frac{27}{2}u^6 + 22u^5 - 40u^4 + 64u^3 - \frac{73}{2}u^2 + 10u - \frac{9}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$u^9 + 9u^7 + 3u^6 + 23u^5 + 15u^4 + 7u^3 + 5u^2 + 1$
c_2	$u^9 + 18u^8 + \cdots - 10u - 1$
c_5, c_6, c_{10}	$u^9 - 3u^8 + 5u^6 + u^5 - 2u^4 - 9u^3 + 5u^2 + u + 2$
c_9	$u^9 + u^8 + 22u^7 + 19u^6 + 127u^5 + 84u^4 + 67u^3 - 41u^2 + 23u + 8$
c_{11}	$u^9 + 9u^8 + 38u^7 + 85u^6 + 87u^5 - 18u^4 - 147u^3 - 167u^2 - 85u - 26$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$y^9 + 18y^8 + \cdots - 10y - 1$
c_2	$y^9 - 70y^8 + \cdots - 10y - 1$
c_5, c_6, c_{10}	$y^9 - 9y^8 + 32y^7 - 55y^6 + 53y^5 - 60y^4 + 83y^3 - 35y^2 - 19y - 4$
c_9	$y^9 + 43y^8 + \cdots + 1185y - 64$
c_{11}	$y^9 - 5y^8 + \cdots - 1459y - 676$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.721273$ $a = 1.00000$ $b = -0.684414$	-3.38429	-0.599760
$u = 0.159982 + 0.567821I$ $a = 1.00000$ $b = 0.666256 - 0.688894I$	$-4.68408 + 3.45373I$	$-2.44779 - 5.78928I$
$u = 0.159982 - 0.567821I$ $a = 1.00000$ $b = 0.666256 + 0.688894I$	$-4.68408 - 3.45373I$	$-2.44779 + 5.78928I$
$u = -0.198901 + 0.378443I$ $a = 1.00000$ $b = 0.170075 + 0.364475I$	$0.131099 - 0.964036I$	$2.44921 + 7.22651I$
$u = -0.198901 - 0.378443I$ $a = 1.00000$ $b = 0.170075 - 0.364475I$	$0.131099 + 0.964036I$	$2.44921 - 7.22651I$
$u = 0.14689 + 2.12129I$ $a = 1.00000$ $b = -2.55711 - 0.09982I$	$-17.5620 + 3.0332I$	$-3.21143 - 2.16261I$
$u = 0.14689 - 2.12129I$ $a = 1.00000$ $b = -2.55711 + 0.09982I$	$-17.5620 - 3.0332I$	$-3.21143 + 2.16261I$
$u = -0.46861 + 2.14498I$ $a = 1.00000$ $b = -2.43701 + 0.25982I$	$14.7600 - 7.7767I$	$-5.49011 + 2.86525I$
$u = -0.46861 - 2.14498I$ $a = 1.00000$ $b = -2.43701 - 0.25982I$	$14.7600 + 7.7767I$	$-5.49011 - 2.86525I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4bu + 4u - 4$

(iv) u-Polynomials at the component

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

(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, c_6, c_{10}	$(y^3-3y^2+2y+1)^2$
c_9	$(y^3-y^2+2y-1)^2$
c_{11}	$(y^3+y^2+2y+1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = -1.00000$ $b = 0.255138 - 0.877439I$	$-6.31400 - 2.82812I$	$-7.50976 + 2.97945I$
$u = 1.000000I$ $a = -1.00000$ $b = 1.000000 + 0.754878I$	-2.17641	$-6 - 0.980489 + 0.10I$
$u = 1.000000I$ $a = -1.00000$ $b = 1.74486 - 0.87744I$	$-6.31400 + 2.82812I$	$-7.50976 - 2.97945I$
$u = -1.000000I$ $a = -1.00000$ $b = 0.255138 + 0.877439I$	$-6.31400 + 2.82812I$	$-7.50976 - 2.97945I$
$u = -1.000000I$ $a = -1.00000$ $b = 1.000000 - 0.754878I$	-2.17641	$-6 - 0.980489 + 0.10I$
$u = -1.000000I$ $a = -1.00000$ $b = 1.74486 + 0.87744I$	$-6.31400 - 2.82812I$	$-7.50976 + 2.97945I$

III. $I_3^u = \langle b-1,\ u^3+6u^2+15a+4u+20,\ u^4+u^3+4u^2+5\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-\frac{1}{15}u^3-\frac{2}{5}u^2-\frac{4}{15}u-\frac{4}{3}\\1\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-\frac{1}{15}u^3-\frac{2}{5}u^2-\frac{4}{15}u-\frac{4}{3}\\-\frac{1}{3}u^3-\frac{1}{3}u-\frac{2}{3}\end{pmatrix}$$
$$a_9 = \begin{pmatrix}\frac{8}{15}u^3+\frac{1}{5}u^2+\frac{17}{15}u-\frac{1}{3}\\-\frac{1}{3}u^3-\frac{1}{3}u+\frac{1}{3}\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}\frac{1}{5}u^3+\frac{1}{5}u^2+\frac{4}{5}u\\-\frac{1}{3}u^3-\frac{1}{3}u+\frac{1}{3}\end{pmatrix}$$
$$a_3 = \begin{pmatrix}u^2+1\\-u^2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u\\u^3+u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-\frac{4}{15}u^3-\frac{3}{5}u^2-\frac{1}{15}u-\frac{1}{3}\\-u^3-u-1\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-\frac{2}{15}u^3-\frac{4}{5}u^2-\frac{8}{15}u-\frac{5}{3}\\-\frac{2}{3}u^3-\frac{2}{3}u-\frac{4}{3}\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-\frac{2}{15}u^3-\frac{4}{5}u^2-\frac{8}{15}u-\frac{5}{3}\\-\frac{2}{3}u^3-\frac{2}{3}u-\frac{4}{3}\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$u^4 - u^3 + 4u^2 + 5$
c_2	$u^4 + 7u^3 + 26u^2 + 40u + 25$
c_5, c_6, c_{10}	$(u^2 + u - 1)^2$
c_9	$(u^2 - u - 1)^2$
c_{11}	$(u^2 - 3u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$y^4 + 7y^3 + 26y^2 + 40y + 25$
c_2	$y^4 + 3y^3 + 166y^2 - 300y + 625$
c_5, c_6, c_9 c_{10}	$(y^2 - 3y + 1)^2$
c_{11}	$(y^2 - 7y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.309017 + 1.134230I$ $a = -0.861803 - 0.507242I$ $b = 1.00000$	-4.27683	-6.00000
$u = 0.309017 - 1.134230I$ $a = -0.861803 + 0.507242I$ $b = 1.00000$	-4.27683	-6.00000
$u = -0.80902 + 1.72149I$ $a = -0.638197 + 0.769873I$ $b = 1.00000$	-12.1725	-6.00000
$u = -0.80902 - 1.72149I$ $a = -0.638197 - 0.769873I$ $b = 1.00000$	-12.1725	-6.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$(u^2+1)^3(u^4-u^3+4u^2+5)$ $\cdot (u^9+9u^7+3u^6+23u^5+15u^4+7u^3+5u^2+1)$
c_2	$((u+1)^6)(u^4+7u^3+\cdots+40u+25)(u^9+18u^8+\cdots-10u-1)$
c_5, c_6, c_{10}	$(u^2+u-1)^2(u^6-3u^4+2u^2+1)$ $\cdot (u^9-3u^8+5u^6+u^5-2u^4-9u^3+5u^2+u+2)$
c_9	$(u^2-u-1)^2(u^3-u^2+1)^2$ $\cdot (u^9+u^8+22u^7+19u^6+127u^5+84u^4+67u^3-41u^2+23u+8)$
c_{11}	$(u^2-3u+1)^2(u^6+u^4+2u^2+1)$ $\cdot (u^9+9u^8+38u^7+85u^6+87u^5-18u^4-147u^3-167u^2-85u-26)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_4 c_7, c_8	$((y+1)^6)(y^4+7y^3+\cdots+40y+25)(y^9+18y^8+\cdots-10y-1)$
c_2	$((y-1)^6)(y^4+3y^3+\cdots-300y+625)(y^9-70y^8+\cdots-10y-1)$
c_5, c_6, c_{10}	$(y^2-3y+1)^2(y^3-3y^2+2y+1)^2$ $\cdot(y^9-9y^8+32y^7-55y^6+53y^5-60y^4+83y^3-35y^2-19y-4)$
c_9	$((y^2-3y+1)^2)(y^3-y^2+2y-1)^2(y^9+43y^8+\cdots+1185y-64)$
c_{11}	$((y^2-7y+1)^2)(y^3+y^2+2y+1)^2(y^9-5y^8+\cdots-1459y-676)$