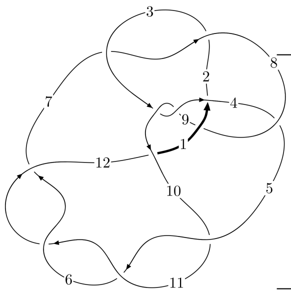
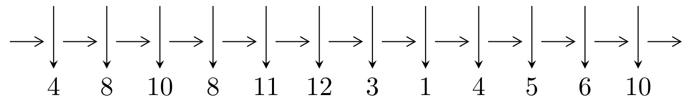
$12n_{0850}$ $(K12n_{0850})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

$$5,10 \underset{c_{10}}{\rightarrow} 11 \underset{c_5}{\rightarrow} 6 \underset{c_{11}}{\rightarrow} 12 \underset{c_{12}}{\rightarrow} 1,8 \underset{c_4}{\rightarrow} 4 \underset{c_1}{\rightarrow} 2 \underset{c_3}{\rightarrow} 3 \underset{c_7}{\rightarrow} 7 \underset{c_9}{\rightarrow} 9 \twoheadrightarrow c_2, c_6, c_8$$

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

$$\begin{aligned}
I_1^u = \langle &-u^{10} - 5u^9 - 4u^8 + 8u^7 - u^6 - 16u^5 + 19u^4 + 20u^3 - 15u^2 + 2b + 5u + 4, \\
&-3u^{10} - 10u^9 - u^8 + 14u^7 - 17u^6 - 17u^5 + 47u^4 + 13u^3 - 25u^2 + 2a + 18u + 7, \\
&u^{11} + 5u^{10} + 6u^9 - 4u^8 - 3u^7 + 14u^6 - 5u^5 - 30u^4 - u^3 + 9u^2 - 10u - 4\rangle \\
I_2^u = \langle &-u^5 + 4u^3 + b - 3u,\ u^5 - 5u^3 + u^2 + a + 6u - 3,\ u^7 - u^6 - 5u^5 + 5u^4 + 6u^3 - 7u^2 + u + 1\rangle \\
I_3^u = \langle &b,\ a + 1,\ u + 1\rangle \\
I_4^u = \langle &-a^3 + b + a + 1,\ a^4 + a^3 - 2a - 1,\ u - 1\rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 23 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. $I^u_1 =$
$\langle -u^{10}-5u^9+\cdots+2b+4,\ -3u^{10}-10u^9+\cdots+2a+7,\ u^{11}+5u^{10}+\cdots-10u-4\rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^4-3u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_8 = \begin{pmatrix}\frac{3}{2}u^{10}+5u^9+\cdots-9u-\frac{7}{2}\\\frac{1}{2}u^{10}+\frac{5}{2}u^9+\cdots-\frac{5}{2}u-2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}\frac{1}{4}u^{10}+\frac{3}{4}u^9+\cdots-\frac{5}{4}u-1\\-\frac{1}{2}u^{10}-\frac{3}{2}u^9+\cdots+\frac{5}{2}u+1\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-\frac{1}{2}u^9-\frac{1}{2}u^8+\cdots+\frac{1}{2}u+\frac{3}{2}\\\frac{5}{2}u^{10}+\frac{17}{2}u^9+\cdots-\frac{23}{2}u-6\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-\frac{1}{4}u^{10}-\frac{3}{4}u^9+\cdots-\frac{3}{4}u^2+\frac{5}{4}u\\-\frac{1}{2}u^{10}-\frac{3}{2}u^9+\cdots+\frac{5}{2}u+1\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u^3-2u\\u^5-3u^3+u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^{10}-\frac{5}{2}u^9+\cdots+\frac{7}{2}u+\frac{5}{2}\\-\frac{1}{2}u^{10}-\frac{5}{2}u^9+\cdots+\frac{7}{2}u+2\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -7u^{10}-25u^9-6u^8+36u^7-35u^6-50u^5+113u^4+43u^3-65u^2+46u+2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{11} - 7u^{10} + \cdots - 2u + 2$
c_2, c_3, c_7 c_9	$u^{11} + 14u^9 + 4u^8 + 46u^7 + 67u^6 - 66u^5 - 7u^4 - 30u^3 - 9u^2 - 3u - 1$
c_4, c_8	$u^{11} + u^{10} + \cdots - 4u - 1$
c_5, c_6, c_{10} c_{11}	$u^{11} + 5u^{10} + \cdots - 10u - 4$
c_{12}	$u^{11} - 3u^{10} + \cdots - 3192u - 576$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{11} - 31y^{10} + \cdots + 200y - 4$
c_2, c_3, c_7 c_9	$y^{11} + 28y^{10} + \cdots - 9y - 1$
c_4, c_8	$y^{11} + 17y^{10} + \cdots + 24y - 1$
c_5, c_6, c_{10} c_{11}	$y^{11} - 13y^{10} + \cdots + 172y - 16$
c_{12}	$y^{11} + 67y^{10} + \cdots + 7508160y - 331776$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.18814$ $a = 0.348347$ $b = -0.566087$	-5.45154	-15.3520
$u = 0.651462 + 1.063750I$ $a = 1.81578 + 0.65642I$ $b = -1.77237 + 0.06609I$	$12.65630 - 3.45618I$	$-10.65599 + 2.10885I$
$u = 0.651462 - 1.063750I$ $a = 1.81578 - 0.65642I$ $b = -1.77237 - 0.06609I$	$12.65630 + 3.45618I$	$-10.65599 - 2.10885I$
$u = 0.496165 + 0.539201I$ $a = -1.042860 - 0.661841I$ $b = 1.138470 - 0.357731I$	$2.08534 - 1.86536I$	$-10.69284 + 5.33447I$
$u = 0.496165 - 0.539201I$ $a = -1.042860 + 0.661841I$ $b = 1.138470 + 0.357731I$	$2.08534 + 1.86536I$	$-10.69284 - 5.33447I$
$u = -1.53157 + 0.15203I$ $a = -0.354779 + 0.587363I$ $b = 1.12977 + 1.06011I$	$-4.66784 + 4.30939I$	$-14.0390 - 6.9085I$
$u = -1.53157 - 0.15203I$ $a = -0.354779 - 0.587363I$ $b = 1.12977 - 1.06011I$	$-4.66784 - 4.30939I$	$-14.0390 + 6.9085I$
$u = -0.330126$ $a = 0.768686$ $b = -0.139205$	-0.487897	-20.3390
$u = -1.64929 + 0.39522I$ $a = 0.914271 - 0.873133I$ $b = -1.77328 - 0.21395I$	$5.23140 + 8.93346I$	$-13.21655 - 3.59394I$
$u = -1.64929 - 0.39522I$ $a = 0.914271 + 0.873133I$ $b = -1.77328 + 0.21395I$	$5.23140 - 8.93346I$	$-13.21655 + 3.59394I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.79155$ $a = \quad 0.218139$ $b = -0.739878$	-16.4464	-7.09980

II. $\boldsymbol{I_2^u = \langle -u^5 + 4u^3 + b - 3u,\ u^5 - 5u^3 + u^2 + a + 6u - 3,\ u^7 - u^6 - 5u^5 + 5u^4 + 6u^3 - 7u^2 + u + 1\rangle}$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_{12} = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^4 - 3u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^5 + 5u^3 - u^2 - 6u + 3 \\ u^5 - 4u^3 + 3u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^6 + u^5 + 4u^4 - 5u^3 - 2u^2 + 7u - 4 \\ u^4 - 3u^2 + 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -2u^6 + 2u^5 + 10u^4 - 10u^3 - 11u^2 + 14u - 4 \\ u^6 - 5u^4 + u^3 + 6u^2 - 3u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^6 + u^5 + 5u^4 - 5u^3 - 5u^2 + 7u - 3 \\ u^4 - 3u^2 + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^3 - 2u \\ u^5 - 3u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^5 + 5u^3 - u^2 - 6u + 4 \\ -u^3 + 2u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2u^6 - 2u^5 - 12u^4 + 5u^3 + 16u^2 - 3u - 10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^7 - 12y^6 + 26y^5 + 11y^4 - 29y^3 - 31y^2 - 6y - 1$
c_2, c_3, c_7 c_9	$y^7 + y^6 - 3y^5 - 6y^4 - 2y^3 + 3y^2 + 2y - 1$
c_4, c_8	$y^7 - 2y^6 - 3y^5 + 2y^4 + 6y^3 + 3y^2 - y - 1$
c_5, c_6, c_{10} c_{11}	$y^7 - 11y^6 + 47y^5 - 97y^4 + 98y^3 - 47y^2 + 15y - 1$
c_{12}	$y^7 - 11y^6 - 9y^5 - 141y^4 + 26y^3 - 79y^2 + 39y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.602602 + 0.366097I$ $a = -0.802378 - 0.958802I$ $b = 1.74200 - 0.23095I$	$3.42389 - 1.23175I$	$-6.47743 + 5.11160I$
$u = 0.602602 - 0.366097I$ $a = -0.802378 + 0.958802I$ $b = 1.74200 + 0.23095I$	$3.42389 + 1.23175I$	$-6.47743 - 5.11160I$
$u = 1.50894$ $a = 1.02523$ $b = -1.39324$	-10.4234	-15.1670
$u = -1.59539 + 0.14916I$ $a = -0.285687 + 0.511963I$ $b = 1.59460 + 0.65214I$	$-4.17528 + 3.26775I$	$-10.72162 - 1.02180I$
$u = -1.59539 - 0.14916I$ $a = -0.285687 - 0.511963I$ $b = 1.59460 - 0.65214I$	$-4.17528 - 3.26775I$	$-10.72162 + 1.02180I$
$u = -0.293328$ $a = 4.54991$ $b = -0.781203$	-4.14361	-7.95280
$u = 1.76997$ $a = -0.399006$ $b = 0.501243$	-16.8289	-28.4820

III. $I_3^u = \langle b,\ a+1,\ u+1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -3 \\ -1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -2 \\ -1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -24$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u-2$
c_2, c_4, c_8 c_9, c_{10}, c_{11} c_{12}	$u+1$
c_3, c_5, c_6 c_7	$u-1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y-4$
c_2, c_3, c_4 c_5, c_6, c_7 c_8, c_9, c_{10} c_{11}, c_{12}	$y-1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = -1.00000$ $b = 0$	-6.57974	-24.0000

IV. $\boldsymbol{I_4^u = \langle -a^3 + b + a + 1,\ a^4 + a^3 - 2a - 1,\ u - 1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} a \\ a^3 - a - 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a^2 \\ -a^3 - a^2 + a + 2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -a - 2 \\ a^3 - 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -a^3 + a + 2 \\ -a^3 - a^2 + a + 2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ -1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -a^3 + a + 1 \\ 2a^3 - a - 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^2+u-1)^2$
c_2, c_3, c_7 c_9	$u^4-u^3+2u^2-4u+1$
c_4, c_8	u^4+u^3-2u-1
c_5, c_6, c_{10} c_{11}	$(u-1)^4$
c_{12}	$(u+1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^2-3y+1)^2$
c_2, c_3, c_7 c_9	$y^4+3y^3-2y^2-12y+1$
c_4, c_8	$y^4-y^3+2y^2-4y+1$
c_5, c_6, c_{10} c_{11}, c_{12}	$(y-1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 1.15372$ $b = -0.618034$	-5.59278	-14.0000
$u = 1.00000$ $a = -0.809017 + 0.981593I$ $b = 1.61803$	2.30291	-14.0000
$u = 1.00000$ $a = -0.809017 - 0.981593I$ $b = 1.61803$	2.30291	-14.0000
$u = 1.00000$ $a = -0.535687$ $b = -0.618034$	-5.59278	-14.0000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-2)(u^2+u-1)^2(u^7-6u^6+12u^5-11u^4+7u^3-3u^2-1)$ $\cdot(u^{11}-7u^{10}+\cdots-2u+2)$
c_2, c_9	$(u+1)(u^4-u^3+2u^2-4u+1)(u^7-u^6+u^5-2u^4-u^2+1)$ $\cdot(u^{11}+14u^9+4u^8+46u^7+67u^6-66u^5-7u^4-30u^3-9u^2-3u-1)$
c_3, c_7	$(u-1)(u^4-u^3+2u^2-4u+1)(u^7+u^6+u^5+2u^4+u^2-1)$ $\cdot(u^{11}+14u^9+4u^8+46u^7+67u^6-66u^5-7u^4-30u^3-9u^2-3u-1)$
c_4, c_8	$(u+1)(u^4+u^3-2u-1)(u^7-u^5-2u^3+u^2-u+1)$ $\cdot(u^{11}+u^{10}+\cdots-4u-1)$
c_5, c_6	$(u-1)^5(u^7+u^6-5u^5-5u^4+6u^3+7u^2+u-1)$ $\cdot(u^{11}+5u^{10}+\cdots-10u-4)$
c_{10}, c_{11}	$(u-1)^4(u+1)(u^7-u^6-5u^5+5u^4+6u^3-7u^2+u+1)$ $\cdot(u^{11}+5u^{10}+\cdots-10u-4)$
c_{12}	$(u+1)^5(u^7-5u^6+7u^5-5u^4-4u^3-7u^2+5u+1)$ $\cdot(u^{11}-3u^{10}+\cdots-3192u-576)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-4)(y^2-3y+1)^2(y^7-12y^6+\cdots-6y-1)$ $\cdot(y^{11}-31y^{10}+\cdots+200y-4)$
c_2, c_3, c_7 c_9	$(y-1)(y^4+3y^3-2y^2-12y+1)$ $\cdot(y^7+y^6+\cdots+2y-1)(y^{11}+28y^{10}+\cdots-9y-1)$
c_4, c_8	$(y-1)(y^4-y^3+2y^2-4y+1)(y^7-2y^6+\cdots-y-1)$ $\cdot(y^{11}+17y^{10}+\cdots+24y-1)$
c_5, c_6, c_{10} c_{11}	$(y-1)^5(y^7-11y^6+47y^5-97y^4+98y^3-47y^2+15y-1)$ $\cdot(y^{11}-13y^{10}+\cdots+172y-16)$
c_{12}	$(y-1)^5(y^7-11y^6-9y^5-141y^4+26y^3-79y^2+39y-1)$ $\cdot(y^{11}+67y^{10}+\cdots+7508160y-331776)$