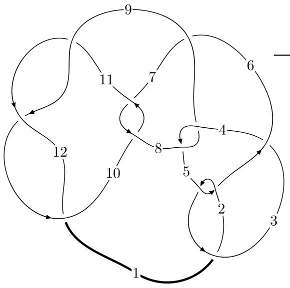
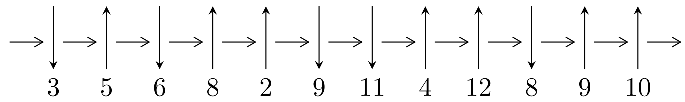
$12n_{0010}$ $(K12n_{0010})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & 373570485293358u^{28} + 1033333880231479u^{27} + \cdots + 1737205994835979b - 46103598198659, \\
& -452869533551973u^{28} - 703336104853671u^{27} + \cdots + 1737205994835979a - 136865573763131, \\
& u^{29} + 2u^{28} + \cdots - u - 1 \rangle \\
I_2^u = \langle & -u^3 + b - u - 1,\ a,\ u^4 + u^2 + u + 1 \rangle \\
I_3^u = \langle & -u^5 + u^4 - 2u^3 + 2u^2 + b - 2u + 2,\ a,\ u^6 - u^5 + 2u^4 - 2u^3 + 2u^2 - 2u + 1 \rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 39 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.

$$\boldsymbol{I_1^u = \langle 3.74\times 10^{14}u^{28}+1.03\times 10^{15}u^{27}+\cdots+1.74\times 10^{15}b-4.61\times 10^{13},\ -4.53\times 10^{14}u^{28}-7.03\times 10^{14}u^{27}+\cdots+1.74\times 10^{15}a-1.37\times 10^{14},\ u^{29}+2u^{28}+\cdots-u-1\rangle}$$

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$

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

$$a_4 = \begin{pmatrix}1\\u^2\end{pmatrix}$$

$$a_9 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}0.260688u^{28}+0.404866u^{27}+\cdots+1.65378u+0.0787849\\-0.215041u^{28}-0.594825u^{27}+\cdots+2.17523u+0.0265389\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}u\\-0.574992u^{28}-1.22877u^{27}+\cdots+1.37727u+0.0642647\end{pmatrix}$$

$$a_7 = \begin{pmatrix}0.281422u^{28}+0.665341u^{27}+\cdots+0.425718u-0.328077\\-0.300941u^{28}-0.245733u^{27}+\cdots+0.372268u-0.413702\end{pmatrix}$$

$$a_6 = \begin{pmatrix}0.0992626u^{28}+0.229078u^{27}+\cdots+0.144178u-0.116511\\-0.422114u^{28}-0.580655u^{27}+\cdots-0.163376u-0.274080\end{pmatrix}$$

$$a_3 = \begin{pmatrix}0.0599722u^{28}+0.00259463u^{27}+\cdots-0.0401153u+1.59959\\0.138580u^{28}+0.0401668u^{27}+\cdots-0.139073u+1.22534\end{pmatrix}$$

$$a_2 = \begin{pmatrix}-0.0786083u^{28}-0.0375722u^{27}+\cdots+0.0989573u+0.374257\\0.138580u^{28}+0.0401668u^{27}+\cdots-0.139073u+1.22534\end{pmatrix}$$

$$a_1 = \begin{pmatrix}0.493107u^{28}+0.774647u^{27}+\cdots+0.437369u+0.188122\\0.393844u^{28}+0.545569u^{27}+\cdots+0.293191u+0.304633\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}0.260688u^{28}+0.404866u^{27}+\cdots+1.65378u+0.0787849\\-0.314304u^{28}-0.823903u^{27}+\cdots+2.03105u+0.143050\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$$= -\frac{7883435024310839}{1737205994835979}u^{28}-\frac{14219216887312602}{1737205994835979}u^{27}+\cdots+\frac{21942781332157203}{1737205994835979}u+\frac{8811379112410107}{1737205994835979}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{29} + 12u^{28} + \cdots + u - 1$
c_2, c_5	$u^{29} + 2u^{28} + \cdots + u - 1$
c_3	$u^{29} - 2u^{28} + \cdots + 120u - 36$
c_4, c_8	$u^{29} - 2u^{28} + \cdots - u + 1$
c_6	$u^{29} - 10u^{28} + \cdots - 469083u + 52489$
c_7, c_{10}	$u^{29} - 5u^{28} + \cdots - 3072u - 1024$
c_9, c_{11}, c_{12}	$u^{29} + 11u^{28} + \cdots - 30u^2 - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{29} + 12y^{28} + \cdots + 85y - 1$
c_2, c_5	$y^{29} + 12y^{28} + \cdots + y - 1$
c_3	$y^{29} + 12y^{28} + \cdots - 12456y - 1296$
c_4, c_8	$y^{29} + 30y^{27} + \cdots + y - 1$
c_6	$y^{29} + 92y^{28} + \cdots - 44517246691y - 2755095121$
c_7, c_{10}	$y^{29} + 63y^{28} + \cdots + 3670016y - 1048576$
c_9, c_{11}, c_{12}	$y^{29} - 51y^{28} + \cdots - 60y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.269747 + 0.997117I$ $a = -0.080093 + 0.634791I$ $b = -0.459723 - 0.451799I$	$-3.76543 - 0.40137I$	$-7.74784 + 0.84155I$
$u = 0.269747 - 0.997117I$ $a = -0.080093 - 0.634791I$ $b = -0.459723 + 0.451799I$	$-3.76543 + 0.40137I$	$-7.74784 - 0.84155I$
$u = -0.520591 + 0.795499I$ $a = 0.040524 + 0.941049I$ $b = 1.201380 + 0.062565I$	$0.03144 - 1.92773I$	$1.38434 + 3.11728I$
$u = -0.520591 - 0.795499I$ $a = 0.040524 - 0.941049I$ $b = 1.201380 - 0.062565I$	$0.03144 + 1.92773I$	$1.38434 - 3.11728I$
$u = -0.896581 + 0.315451I$ $a = -1.90204 + 1.76626I$ $b = -0.36922 + 3.53096I$	$4.34061 - 5.06790I$	$7.76076 + 6.40955I$
$u = -0.896581 - 0.315451I$ $a = -1.90204 - 1.76626I$ $b = -0.36922 - 3.53096I$	$4.34061 + 5.06790I$	$7.76076 - 6.40955I$
$u = 0.888576 + 0.223844I$ $a = 2.22962 + 1.30457I$ $b = 1.34311 + 2.77938I$	$4.83420 - 0.14491I$	$9.33140 - 0.02437I$
$u = 0.888576 - 0.223844I$ $a = 2.22962 - 1.30457I$ $b = 1.34311 - 2.77938I$	$4.83420 + 0.14491I$	$9.33140 + 0.02437I$
$u = 0.586489 + 0.957504I$ $a = -0.302708 + 0.858093I$ $b = -1.34326 - 0.63754I$	$-1.89724 + 6.62062I$	$-1.77451 - 5.81131I$
$u = 0.586489 - 0.957504I$ $a = -0.302708 - 0.858093I$ $b = -1.34326 + 0.63754I$	$-1.89724 - 6.62062I$	$-1.77451 + 5.81131I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.538341 + 0.454787I$ $a = -0.661454 + 0.909012I$ $b = 0.67192 + 1.39992I$	$0.49621 - 1.44403I$	$2.32169 + 4.35214I$
$u = -0.538341 - 0.454787I$ $a = -0.661454 - 0.909012I$ $b = 0.67192 - 1.39992I$	$0.49621 + 1.44403I$	$2.32169 - 4.35214I$
$u = -0.454661 + 0.440048I$ $a = -0.603679 + 0.541804I$ $b = -0.128589 + 1.154160I$	$0.61760 - 1.38123I$	$3.89803 + 4.67424I$
$u = -0.454661 - 0.440048I$ $a = -0.603679 - 0.541804I$ $b = -0.128589 - 1.154160I$	$0.61760 + 1.38123I$	$3.89803 - 4.67424I$
$u = 0.571853 + 0.250420I$ $a = 0.590811 + 0.162782I$ $b = 0.832609 + 0.563271I$	$-0.23394 - 2.60554I$	$1.51395 + 2.58658I$
$u = 0.571853 - 0.250420I$ $a = 0.590811 - 0.162782I$ $b = 0.832609 - 0.563271I$	$-0.23394 + 2.60554I$	$1.51395 - 2.58658I$
$u = 0.600458$ $a = 1.34216$ $b = -0.231076$	2.41354	4.07200
$u = -0.092427 + 0.519848I$ $a = -0.242741 + 1.091430I$ $b = 0.12625 + 2.93959I$	$2.03975 + 2.27000I$	$-9.41057 + 5.26980I$
$u = -0.092427 - 0.519848I$ $a = -0.242741 - 1.091430I$ $b = 0.12625 - 2.93959I$	$2.03975 - 2.27000I$	$-9.41057 - 5.26980I$
$u = -1.10611 + 1.07911I$ $a = 0.66217 - 1.55771I$ $b = -4.13956 - 3.94336I$	$15.6166 - 12.3453I$	$4.17843 + 6.31172I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.10611 - 1.07911I$ $a = 0.66217 + 1.55771I$ $b = -4.13956 + 3.94336I$	$15.6166 + 12.3453I$	$4.17843 - 6.31172I$
$u = 1.10589 + 1.08681I$ $a = -0.81738 - 1.52507I$ $b = 3.91452 - 4.33465I$	$17.5116 + 6.4339I$	$6.30123 - 2.11610I$
$u = 1.10589 - 1.08681I$ $a = -0.81738 + 1.52507I$ $b = 3.91452 + 4.33465I$	$17.5116 - 6.4339I$	$6.30123 + 2.11610I$
$u = 1.10403 + 1.10245I$ $a = -1.17352 - 1.22596I$ $b = 2.76455 - 5.02114I$	$17.4749 + 1.6883I$	$6.38533 - 1.83848I$
$u = 1.10403 - 1.10245I$ $a = -1.17352 + 1.22596I$ $b = 2.76455 + 5.02114I$	$17.4749 - 1.6883I$	$6.38533 + 1.83848I$
$u = -1.10116 + 1.10760I$ $a = 1.23857 - 1.06154I$ $b = -2.25205 - 5.03203I$	$15.5469 + 4.2345I$	$4.31422 - 2.32649I$
$u = -1.10116 - 1.10760I$ $a = 1.23857 + 1.06154I$ $b = -2.25205 + 5.03203I$	$15.5469 - 4.2345I$	$4.31422 + 2.32649I$
$u = -1.11694 + 1.09740I$ $a = 0.85084 - 1.21443I$ $b = -3.04641 - 4.13857I$	$10.89410 - 4.09225I$	$1.50754 + 2.07565I$
$u = -1.11694 - 1.09740I$ $a = 0.85084 + 1.21443I$ $b = -3.04641 + 4.13857I$	$10.89410 + 4.09225I$	$1.50754 - 2.07565I$

II. $I_2^u = \langle -u^3 + b - u - 1,\ a,\ u^4 + u^2 + u + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^3 - 5u^2 - u + 3$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.547424 + 0.585652I$ $a = 0$ $b = 0.851808 + 0.911292I$	$2.62503 - 1.39709I$	$4.96170 + 3.59727I$
$u = -0.547424 - 0.585652I$ $a = 0$ $b = 0.851808 - 0.911292I$	$2.62503 + 1.39709I$	$4.96170 - 3.59727I$
$u = 0.547424 + 1.120870I$ $a = 0$ $b = -0.351808 + 0.720342I$	$-0.98010 + 7.64338I$	$1.53830 - 8.45840I$
$u = 0.547424 - 1.120870I$ $a = 0$ $b = -0.351808 - 0.720342I$	$-0.98010 - 7.64338I$	$1.53830 + 8.45840I$

III.

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

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$

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

$$a_4 = \begin{pmatrix}1\\u^2\end{pmatrix}$$

$$a_9 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}0\\u^5-u^4+2u^3-2u^2+2u-2\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}-u\\u^5-u^4+u^3-2u^2+u-2\end{pmatrix}$$

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

$$a_6 = \begin{pmatrix}u^3\\u^5+u^3+u\end{pmatrix}$$

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

$$a_2 = \begin{pmatrix}u^4+u^2-u+1\\-u^5-2u^3+u^2-u+1\end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix}0\\u^5-u^4+2u^3-2u^2+2u-2\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -2u^5+u^4+u^2+u+4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^6 - y^5 + 4y^4 - 2y^3 + 8y^2 + 1$
c_2, c_4, c_5 c_8	$y^6 + 3y^5 + 4y^4 + 2y^3 + 1$
c_3	$(y^3 - y^2 + 2y - 1)^2$
c_7, c_{10}	y^6
c_9, c_{11}, c_{12}	$(y - 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.498832+1.001300I$ $a=0$ $b=0.398606+0.800120I$	$1.37919-2.82812I$	$4.90478+3.87141I$
$u=-0.498832-1.001300I$ $a=0$ $b=0.398606-0.800120I$	$1.37919+2.82812I$	$4.90478-3.87141I$
$u=0.284920+1.115140I$ $a=0$ $b=-0.215080+0.841795I$	-2.75839	$0.235367-0.997558I$
$u=0.284920-1.115140I$ $a=0$ $b=-0.215080-0.841795I$	-2.75839	$0.235367+0.997558I$
$u=0.713912+0.305839I$ $a=0$ $b=-1.183530+0.507021I$	$1.37919-2.82812I$	$5.35985+0.59776I$
$u=0.713912-0.305839I$ $a=0$ $b=-1.183530-0.507021I$	$1.37919+2.82812I$	$5.35985-0.59776I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^4-2u^3+3u^2-u+1)(u^6-3u^5+4u^4-2u^3+1)$ $\cdot(u^{29}+12u^{28}+\cdots+u-1)$
c_2	$(u^4+u^2+u+1)(u^6-u^5+2u^4-2u^3+2u^2-2u+1)$ $\cdot(u^{29}+2u^{28}+\cdots+u-1)$
c_3	$((u^3-u^2+1)^2)(u^4+3u^3+\cdots+3u+2)(u^{29}-2u^{28}+\cdots+120u-36)$
c_4	$(u^4+u^2+u+1)(u^6-u^5+2u^4-2u^3+2u^2-2u+1)$ $\cdot(u^{29}-2u^{28}+\cdots-u+1)$
c_5	$(u^4+u^2-u+1)(u^6+u^5+2u^4+2u^3+2u^2+2u+1)$ $\cdot(u^{29}+2u^{28}+\cdots+u-1)$
c_6	$(u^4-2u^3+3u^2-u+1)(u^6-3u^5+4u^4-2u^3+1)$ $\cdot(u^{29}-10u^{28}+\cdots-469083u+52489)$
c_7, c_{10}	$u^{10}(u^{29}-5u^{28}+\cdots-3072u-1024)$
c_8	$(u^4+u^2-u+1)(u^6+u^5+2u^4+2u^3+2u^2+2u+1)$ $\cdot(u^{29}-2u^{28}+\cdots-u+1)$
c_9	$((u+1)^{10})(u^{29}+11u^{28}+\cdots-30u^2-1)$
c_{11}, c_{12}	$((u-1)^{10})(u^{29}+11u^{28}+\cdots-30u^2-1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^4+2y^3+7y^2+5y+1)(y^6-y^5+4y^4-2y^3+8y^2+1)$ $\cdot\,(y^{29}+12y^{28}+\cdots+85y-1)$
c_2, c_5	$(y^4+2y^3+3y^2+y+1)(y^6+3y^5+4y^4+2y^3+1)$ $\cdot\,(y^{29}+12y^{28}+\cdots+y-1)$
c_3	$(y^3-y^2+2y-1)^2(y^4-y^3+2y^2+7y+4)$ $\cdot\,(y^{29}+12y^{28}+\cdots-12456y-1296)$
c_4, c_8	$(y^4+2y^3+3y^2+y+1)(y^6+3y^5+4y^4+2y^3+1)$ $\cdot\,(y^{29}+30y^{27}+\cdots+y-1)$
c_6	$(y^4+2y^3+7y^2+5y+1)(y^6-y^5+4y^4-2y^3+8y^2+1)$ $\cdot\,(y^{29}+92y^{28}+\cdots-44517246691y-2755095121)$
c_7, c_{10}	$y^{10}(y^{29}+63y^{28}+\cdots+3670016y-1048576)$
c_9, c_{11}, c_{12}	$((y-1)^{10})(y^{29}-51y^{28}+\cdots-60y-1)$