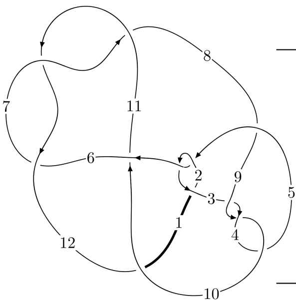
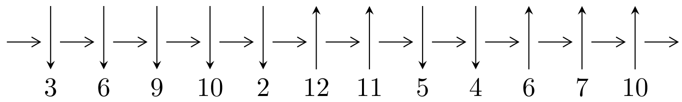
$12n_{0471}$ ($K12n_{0471}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & -147633099219u^{43} + 379863908626u^{42} + \cdots + 5928983388701b - 1077740574717,\\
& 1873032055350u^{43} - 3613432711737u^{42} + \cdots + 1185796777402a - 16189929128661,\\
& u^{44} - 2u^{43} + \cdots - 12u - 1\rangle\\
I_2^u = \langle & b - 1,\ 2u^2a + a^2 - 2au + 4a + u - 1,\ u^3 - u^2 + 2u - 1\rangle\\
I_3^u = \langle & b + 1,\ -u^2 + a - u - 2,\ u^3 + u^2 + 2u + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 53 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. $\boldsymbol{I_1^u = \langle -1.48\times 10^{11}u^{43} + 3.80\times 10^{11}u^{42} + \cdots + 5.93\times 10^{11}b - 1.08\times 10^{12},\ 1.87\times 10^{12}u^{43} - 3.61\times 10^{12}u^{42} + \cdots + 1.19\times 10^{12}a - 1.62\times 10^{13},\ u^{44} - 2u^{43} + \cdots - 12u - 1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$

$$a_3 = \begin{pmatrix}-1.57956u^{43} + 3.04726u^{42} + \cdots + 15.8478u + 13.6532\\0.249002u^{43} - 0.640690u^{42} + \cdots + 7.19437u + 1.81775\end{pmatrix}$$

$$a_7 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$

$$a_2 = \begin{pmatrix}-1.33055u^{43} + 2.40657u^{42} + \cdots + 23.0422u + 15.4710\\0.249002u^{43} - 0.640690u^{42} + \cdots + 7.19437u + 1.81775\end{pmatrix}$$

$$a_1 = \begin{pmatrix}u^7 + 4u^5 + 4u^3\\-u^7 - 3u^5 - 2u^3 + u\end{pmatrix}$$

$$a_5 = \begin{pmatrix}1.94605u^{43} - 3.56049u^{42} + \cdots - 33.9928u - 16.2437\\-0.106829u^{43} + 0.292551u^{42} + \cdots - 3.38360u - 1.39701\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}-u\\u^3 + u\end{pmatrix}$$

$$a_8 = \begin{pmatrix}u^2 + 1\\-u^4 - 2u^2\end{pmatrix}$$

$$a_9 = \begin{pmatrix}-1.90349u^{43} + 4.58255u^{42} + \cdots + 32.9049u + 21.3530\\-0.231468u^{43} + 0.479188u^{42} + \cdots + 1.51379u + 1.68525\end{pmatrix}$$

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

$$a_4 = \begin{pmatrix}1.63753u^{43} - 3.01547u^{42} + \cdots - 38.8903u - 16.9586\\0.0851016u^{43} - 0.122356u^{42} + \cdots - 0.258282u - 0.988042\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{2485463566620}{592898388701}u^{43} + \frac{11178511140785}{592898388701}u^{42} + \cdots - \frac{3366360188518}{592898388701}u - \frac{8799598819910}{592898388701}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{44} + 14u^{43} + \cdots + 687u + 49$
c_2, c_5	$u^{44} + 4u^{43} + \cdots + 13u - 7$
c_3, c_4, c_9	$u^{44} - u^{43} + \cdots - 8u - 8$
c_6, c_7, c_{11}	$u^{44} - 2u^{43} + \cdots - 12u - 1$
c_8	$u^{44} + 3u^{43} + \cdots + 8u + 8$
c_{10}	$u^{44} + 2u^{43} + \cdots - 216u - 13$
c_{12}	$u^{44} + 20u^{43} + \cdots - 582288u + 12161$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{44} + 42y^{43} + \cdots - 11859y + 2401$
c_2, c_5	$y^{44} - 14y^{43} + \cdots - 687y + 49$
c_3, c_4, c_9	$y^{44} - 37y^{43} + \cdots - 64y + 64$
c_6, c_7, c_{11}	$y^{44} + 36y^{43} + \cdots - 120y + 1$
c_8	$y^{44} + 47y^{43} + \cdots - 960y + 64$
c_{10}	$y^{44} - 44y^{43} + \cdots - 21852y + 169$
c_{12}	$y^{44} - 68y^{43} + \cdots - 423863999800y + 147889921$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.177625 + 1.046220I$ $a = 0.142421 - 1.282600I$ $b = -0.111509 + 0.704372I$	$-1.13792 + 1.81248I$	$-1.86603 - 4.45266I$
$u = 0.177625 - 1.046220I$ $a = 0.142421 + 1.282600I$ $b = -0.111509 - 0.704372I$	$-1.13792 - 1.81248I$	$-1.86603 + 4.45266I$
$u = -0.905481 + 0.047868I$ $a = -1.61810 - 2.71471I$ $b = 0.969501 + 0.973014I$	$8.90320 - 3.55413I$	$1.57190 + 2.73369I$
$u = -0.905481 - 0.047868I$ $a = -1.61810 + 2.71471I$ $b = 0.969501 - 0.973014I$	$8.90320 + 3.55413I$	$1.57190 - 2.73369I$
$u = 0.888633 + 0.113112I$ $a = 1.63253 - 2.72104I$ $b = -1.13181 + 0.84989I$	$4.21307 + 8.73460I$	$-2.10151 - 5.42806I$
$u = 0.888633 - 0.113112I$ $a = 1.63253 + 2.72104I$ $b = -1.13181 - 0.84989I$	$4.21307 - 8.73460I$	$-2.10151 + 5.42806I$
$u = 0.895146 + 0.030335I$ $a = 1.50372 + 2.63941I$ $b = -0.725758 - 1.037770I$	$5.49591 + 1.83935I$	$-0.526060 - 1.054264I$
$u = 0.895146 - 0.030335I$ $a = 1.50372 - 2.63941I$ $b = -0.725758 + 1.037770I$	$5.49591 - 1.83935I$	$-0.526060 + 1.054264I$
$u = -0.124146 + 1.195890I$ $a = 0.103513 + 1.322400I$ $b = -1.136390 - 0.239685I$	$-4.44373 - 1.62575I$	$-5.71135 - 1.58189I$
$u = -0.124146 - 1.195890I$ $a = 0.103513 - 1.322400I$ $b = -1.136390 + 0.239685I$	$-4.44373 + 1.62575I$	$-5.71135 + 1.58189I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.028993 + 1.237360I$ $a = 0.27041 + 1.84256I$ $b = 1.116190 - 0.284540I$	$-10.24070 - 0.43963I$	$-11.19118 - 0.81443I$
$u = -0.028993 - 1.237360I$ $a = 0.27041 - 1.84256I$ $b = 1.116190 + 0.284540I$	$-10.24070 + 0.43963I$	$-11.19118 + 0.81443I$
$u = 0.755269$ $a = -2.04829$ $b = 1.32092$	-2.54326	-3.28070
$u = 0.453023 + 1.165750I$ $a = 1.46711 + 1.23873I$ $b = -1.053650 - 0.886079I$	$0.98373 - 3.94476I$	$-4.68762 + 2.02851I$
$u = 0.453023 - 1.165750I$ $a = 1.46711 - 1.23873I$ $b = -1.053650 + 0.886079I$	$0.98373 + 3.94476I$	$-4.68762 - 2.02851I$
$u = -0.254381 + 1.244050I$ $a = -1.35227 - 1.46538I$ $b = 0.461470 + 0.356687I$	$-7.86357 - 3.29517I$	$-5.01423 + 4.50472I$
$u = -0.254381 - 1.244050I$ $a = -1.35227 + 1.46538I$ $b = 0.461470 - 0.356687I$	$-7.86357 + 3.29517I$	$-5.01423 - 4.50472I$
$u = -0.530116 + 0.484400I$ $a = 0.22811 + 1.92477I$ $b = -0.793793 - 0.687491I$	$-1.89298 - 4.16205I$	$-4.34545 + 6.93236I$
$u = -0.530116 - 0.484400I$ $a = 0.22811 - 1.92477I$ $b = -0.793793 + 0.687491I$	$-1.89298 + 4.16205I$	$-4.34545 - 6.93236I$
$u = 0.319810 + 1.254700I$ $a = -0.613086 + 0.914327I$ $b = 1.341730 + 0.022586I$	$-6.42106 + 3.87791I$	$-7.73542 - 3.96367I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.319810 - 1.254700I$ $a = -0.613086 - 0.914327I$ $b = 1.341730 - 0.022586I$	$-6.42106 - 3.87791I$	$-7.73542 + 3.96367I$
$u = -0.447807 + 1.241790I$ $a = -1.49241 + 1.30249I$ $b = 0.865876 - 1.008920I$	$5.21565 - 1.27455I$	0
$u = -0.447807 - 1.241790I$ $a = -1.49241 - 1.30249I$ $b = 0.865876 + 1.008920I$	$5.21565 + 1.27455I$	0
$u = 0.431847 + 1.254620I$ $a = 0.25969 - 2.31831I$ $b = -0.822510 + 0.981509I$	$1.70650 + 2.90262I$	0
$u = 0.431847 - 1.254620I$ $a = 0.25969 + 2.31831I$ $b = -0.822510 - 0.981509I$	$1.70650 - 2.90262I$	0
$u = -0.657910$ $a = -2.47446$ $b = 0.397664$	-4.04738	1.08600
$u = -0.509311 + 0.393833I$ $a = 1.131640 - 0.668056I$ $b = -0.669143 + 0.583071I$	$-1.77451 + 0.52923I$	$-4.16249 + 0.21334I$
$u = -0.509311 - 0.393833I$ $a = 1.131640 + 0.668056I$ $b = -0.669143 - 0.583071I$	$-1.77451 - 0.52923I$	$-4.16249 - 0.21334I$
$u = 0.420827 + 1.304130I$ $a = 1.42832 + 1.31723I$ $b = -0.626328 - 1.065560I$	$1.33689 + 6.54913I$	0
$u = 0.420827 - 1.304130I$ $a = 1.42832 - 1.31723I$ $b = -0.626328 + 1.065560I$	$1.33689 - 6.54913I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.181384 + 1.359970I$ $a = 0.407588 + 0.745307I$ $b = 0.699749 - 0.288589I$	$-4.01419 + 3.49485I$	0
$u = 0.181384 - 1.359970I$ $a = 0.407588 - 0.745307I$ $b = 0.699749 + 0.288589I$	$-4.01419 - 3.49485I$	0
$u = -0.423050 + 1.318510I$ $a = -0.24113 - 2.42704I$ $b = 1.046820 + 0.917522I$	$4.63663 - 8.30735I$	0
$u = -0.423050 - 1.318510I$ $a = -0.24113 + 2.42704I$ $b = 1.046820 - 0.917522I$	$4.63663 + 8.30735I$	0
$u = -0.192973 + 1.390020I$ $a = 0.1114790 + 0.0226378I$ $b = -0.666441 + 0.485044I$	$-7.33799 - 1.99899I$	0
$u = -0.192973 - 1.390020I$ $a = 0.1114790 - 0.0226378I$ $b = -0.666441 - 0.485044I$	$-7.33799 + 1.99899I$	0
$u = 0.397923 + 1.355450I$ $a = 0.17147 - 2.46591I$ $b = -1.17690 + 0.80462I$	$-0.40257 + 13.35110I$	0
$u = 0.397923 - 1.355450I$ $a = 0.17147 + 2.46591I$ $b = -1.17690 - 0.80462I$	$-0.40257 - 13.35110I$	0
$u = 0.536600 + 0.237972I$ $a = 0.147433 + 1.338600I$ $b = 0.375946 - 0.435344I$	$1.05918 + 0.97127I$	$3.52880 - 3.41320I$
$u = 0.536600 - 0.237972I$ $a = 0.147433 - 1.338600I$ $b = 0.375946 + 0.435344I$	$1.05918 - 0.97127I$	$3.52880 + 3.41320I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.13547+1.42408I$ $a=-0.481300+0.967134I$ $b=-0.921093-0.597509I$	$-8.04171-6.36604I$	0
$u=-0.13547-1.42408I$ $a=-0.481300-0.967134I$ $b=-0.921093+0.597509I$	$-8.04171+6.36604I$	0
$u=-0.302868$ $a=\ 2.56595$ $b=-0.846938$	-1.10522	-12.4510
$u=-0.0966649$ $a=\ 11.5425$ $b=\ 1.04441$	-6.54665	-14.0770

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

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} a \\ 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} a+1 \\ 1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -a \\ -1 \end{pmatrix}$$

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

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

$$a_9 = \begin{pmatrix} -u^2a + 2u^2 - a + 1 \\ u^2a - au + a + u \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.215080 + 1.307140I$ $a = 0.814156 - 0.050322I$ $b = 1.00000$	$-9.60386 + 2.82812I$	$-11.50976 - 2.97945I$
$u = 0.215080 + 1.307140I$ $a = -1.05928 + 1.54005I$ $b = 1.00000$	$-9.60386 + 2.82812I$	$-11.50976 - 2.97945I$
$u = 0.215080 - 1.307140I$ $a = 0.814156 + 0.050322I$ $b = 1.00000$	$-9.60386 - 2.82812I$	$-11.50976 + 2.97945I$
$u = 0.215080 - 1.307140I$ $a = -1.05928 - 1.54005I$ $b = 1.00000$	$-9.60386 - 2.82812I$	$-11.50976 + 2.97945I$
$u = 0.569840$ $a = 0.118556$ $b = 1.00000$	-5.46628	-4.98050
$u = 0.569840$ $a = -3.62831$ $b = 1.00000$	-5.46628	-4.98050

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 6u^2+4u+4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = \quad 0.122561 + 0.744862I$ $b = -1.00000$	$-4.66906 - 2.82812I$	$-6.83447 + 1.85489I$
$u = -0.215080 - 1.307140I$ $a = \quad 0.122561 - 0.744862I$ $b = -1.00000$	$-4.66906 + 2.82812I$	$-6.83447 - 1.85489I$
$u = -0.569840$ $a = \quad 1.75488$ $b = -1.00000$	-0.531480	3.66890

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^{44}+14u^{43}+\cdots+687u+49)$
c_2	$((u-1)^3)(u+1)^6(u^{44}+4u^{43}+\cdots+13u-7)$
c_3, c_4, c_9	$u^3(u^2-2)^3(u^{44}-u^{43}+\cdots-8u-8)$
c_5	$((u-1)^6)(u+1)^3(u^{44}+4u^{43}+\cdots+13u-7)$
c_6, c_7	$((u^3-u^2+2u-1)^2)(u^3+u^2+2u+1)(u^{44}-2u^{43}+\cdots-12u-1)$
c_8	$u^3(u^2-2)^3(u^{44}+3u^{43}+\cdots+8u+8)$
c_{10}	$((u^3-u^2+1)^2)(u^3+u^2-1)(u^{44}+2u^{43}+\cdots-216u-13)$
c_{11}	$(u^3-u^2+2u-1)(u^3+u^2+2u+1)^2(u^{44}-2u^{43}+\cdots-12u-1)$
c_{12}	$((u^3+u^2-1)^3)(u^{44}+20u^{43}+\cdots-582288u+12161)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^{44}+42y^{43}+\cdots-11859y+2401)$
c_2, c_5	$((y-1)^9)(y^{44}-14y^{43}+\cdots-687y+49)$
c_3, c_4, c_9	$y^3(y-2)^6(y^{44}-37y^{43}+\cdots-64y+64)$
c_6, c_7, c_{11}	$((y^3+3y^2+2y-1)^3)(y^{44}+36y^{43}+\cdots-120y+1)$
c_8	$y^3(y-2)^6(y^{44}+47y^{43}+\cdots-960y+64)$
c_{10}	$((y^3-y^2+2y-1)^3)(y^{44}-44y^{43}+\cdots-21852y+169)$
c_{12}	$(y^3-y^2+2y-1)^3$ $\cdot(y^{44}-68y^{43}+\cdots-423863999800y+147889921)$