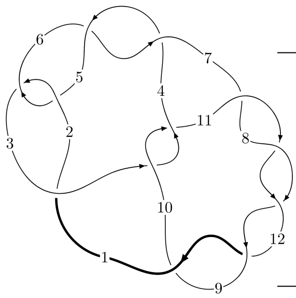
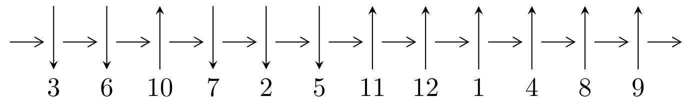
$12a_{0422}$ ($K12a_{0422}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -47u^{38} + 152u^{37} + \cdots + 2b + 26,\ 101u^{38} - 320u^{37} + \cdots + 4a - 62,\ u^{39} - 5u^{38} + \cdots - u + 1\rangle$$
$$I_2^u = \langle b,\ a^3 - a^2u - a^2 + 2au + 4a - 2u - 3,\ u^2 + u - 1\rangle$$
$$I_3^u = \langle b + 1,\ a - 2,\ u + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 46 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. $\boldsymbol{I_1^u = \langle -47u^{38} + 152u^{37} + \cdots + 2b + 26,\ 101u^{38} - 320u^{37} + \cdots + 4a - 62,\ u^{39} - 5u^{38} + \cdots - u + 1\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -\frac{101}{4}u^{38} + 80u^{37} + \cdots - \frac{27}{4}u + \frac{31}{2} \\ \frac{47}{2}u^{38} - 76u^{37} + \cdots + \frac{11}{2}u - 13 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -17.2500u^{38} + 54.7500u^{37} + \cdots - 3.75000u + 10.7500 \\ \frac{31}{2}u^{38} - \frac{203}{4}u^{37} + \cdots + \frac{5}{2}u - \frac{33}{4} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{2}u^{38} + \frac{7}{4}u^{37} + \cdots - 6u + \frac{5}{4} \\ \frac{3}{4}u^{38} - \frac{5}{2}u^{37} + \cdots + \frac{1}{4}u - \frac{1}{2} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^3 + 2u \\ u^5 - 3u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{93}{4}u^{38} - 77u^{37} + \cdots + \frac{19}{4}u - \frac{23}{2} \\ -\frac{75}{2}u^{38} + 122u^{37} + \cdots - \frac{19}{2}u + 22 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{38} + \frac{3}{4}u^{37} + \cdots + \frac{19}{4}u + \frac{1}{4} \\ u^{11} - 7u^9 + 16u^7 - 2u^6 - 13u^5 + 8u^4 + 3u^3 - 6u^2 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -64u^{38} + 210u^{37} + \cdots - 6u + \frac{81}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6	$u^{39} + 8u^{38} + \cdots + 42u + 1$
c_2, c_5	$u^{39} + 2u^{38} + \cdots - 6u + 1$
c_3, c_{10}	$u^{39} + 2u^{38} + \cdots - 160u - 64$
c_7, c_8, c_9 c_{11}, c_{12}	$u^{39} - 5u^{38} + \cdots - u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6	$y^{39} + 48y^{38} + \cdots + 978y - 1$
c_2, c_5	$y^{39} - 8y^{38} + \cdots + 42y - 1$
c_3, c_{10}	$y^{39} - 34y^{38} + \cdots + 25600y - 4096$
c_7, c_8, c_9 c_{11}, c_{12}	$y^{39} - 55y^{38} + \cdots - 9y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.053960 + 0.224778I$ $a = 1.61876 + 0.68220I$ $b = -1.163720 + 0.312418I$	$4.49453 - 5.61479I$	$8.25857 + 7.26249I$
$u = -1.053960 - 0.224778I$ $a = 1.61876 - 0.68220I$ $b = -1.163720 - 0.312418I$	$4.49453 + 5.61479I$	$8.25857 - 7.26249I$
$u = 0.862747 + 0.116296I$ $a = -0.069535 - 0.131159I$ $b = -0.221452 + 0.784770I$	$1.42290 + 1.53553I$	$7.01176 - 4.72842I$
$u = 0.862747 - 0.116296I$ $a = -0.069535 + 0.131159I$ $b = -0.221452 - 0.784770I$	$1.42290 - 1.53553I$	$7.01176 + 4.72842I$
$u = 1.139060 + 0.026381I$ $a = -0.038812 + 0.168804I$ $b = -0.025448 + 1.175110I$	$8.36476 + 3.13639I$	0
$u = 1.139060 - 0.026381I$ $a = -0.038812 - 0.168804I$ $b = -0.025448 - 1.175110I$	$8.36476 - 3.13639I$	0
$u = -1.151060 + 0.133458I$ $a = -1.46113 - 0.36382I$ $b = 1.226750 - 0.126705I$	$6.34383 - 1.26782I$	0
$u = -1.151060 - 0.133458I$ $a = -1.46113 + 0.36382I$ $b = 1.226750 + 0.126705I$	$6.34383 + 1.26782I$	0
$u = 0.415029 + 0.681141I$ $a = -0.293962 - 0.902195I$ $b = -1.43879 - 0.09612I$	$8.68168 - 1.01341I$	$8.20452 - 0.45089I$
$u = 0.415029 - 0.681141I$ $a = -0.293962 + 0.902195I$ $b = -1.43879 + 0.09612I$	$8.68168 + 1.01341I$	$8.20452 + 0.45089I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.379187 + 0.691000I$ $a = 0.296338 + 0.946075I$ $b = 1.43542 + 0.18852I$	$8.57368 + 5.46017I$	$7.82438 - 5.30651I$
$u = 0.379187 - 0.691000I$ $a = 0.296338 - 0.946075I$ $b = 1.43542 - 0.18852I$	$8.57368 - 5.46017I$	$7.82438 + 5.30651I$
$u = -1.160140 + 0.396351I$ $a = 1.23807 + 0.87778I$ $b = -1.52336 + 0.47798I$	$13.3910 - 9.1863I$	0
$u = -1.160140 - 0.396351I$ $a = 1.23807 - 0.87778I$ $b = -1.52336 - 0.47798I$	$13.3910 + 9.1863I$	0
$u = -1.187780 + 0.377695I$ $a = -1.21277 - 0.82919I$ $b = 1.54397 - 0.40480I$	$13.72490 - 2.63237I$	0
$u = -1.187780 - 0.377695I$ $a = -1.21277 + 0.82919I$ $b = 1.54397 + 0.40480I$	$13.72490 + 2.63237I$	0
$u = 0.467926 + 0.375228I$ $a = 0.068401 - 0.656383I$ $b = -0.834315 + 0.134239I$	$1.190300 - 0.320599I$	$8.01474 - 0.06231I$
$u = 0.467926 - 0.375228I$ $a = 0.068401 + 0.656383I$ $b = -0.834315 - 0.134239I$	$1.190300 + 0.320599I$	$8.01474 + 0.06231I$
$u = 0.239901 + 0.477819I$ $a = -0.049714 + 1.108090I$ $b = 0.899573 + 0.293268I$	$0.46281 + 3.25190I$	$3.30026 - 8.26387I$
$u = 0.239901 - 0.477819I$ $a = -0.049714 - 1.108090I$ $b = 0.899573 - 0.293268I$	$0.46281 - 3.25190I$	$3.30026 + 8.26387I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.487731$ $a = 0.343685$ $b = -0.408979$	0.740705	13.6330
$u = -1.59861$ $a = -0.240120$ $b = 0.465924$	8.08529	0
$u = -0.345833 + 0.036532I$ $a = 0.12571 + 3.44175I$ $b = -0.000094 + 0.479895I$	$3.55637 - 2.89653I$	$-3.84297 + 3.88300I$
$u = -0.345833 - 0.036532I$ $a = 0.12571 - 3.44175I$ $b = -0.000094 - 0.479895I$	$3.55637 + 2.89653I$	$-3.84297 - 3.88300I$
$u = -1.67511 + 0.02701I$ $a = -0.088705 - 0.412032I$ $b = 0.229021 + 0.890141I$	$10.40850 - 2.06539I$	0
$u = -1.67511 - 0.02701I$ $a = -0.088705 + 0.412032I$ $b = 0.229021 - 0.890141I$	$10.40850 + 2.06539I$	0
$u = 1.73748$ $a = -2.04429$ $b = 1.35510$	11.5719	0
$u = 1.74621 + 0.05370I$ $a = -1.91054 + 0.23326I$ $b = 1.42871 + 0.37526I$	$14.5888 + 6.7421I$	0
$u = 1.74621 - 0.05370I$ $a = -1.91054 - 0.23326I$ $b = 1.42871 - 0.37526I$	$14.5888 - 6.7421I$	0
$u = -1.76716 + 0.00715I$ $a = -0.013757 - 0.629655I$ $b = 0.04950 + 1.56385I$	$18.9593 - 3.2843I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.76716-0.00715I$ $a=-0.013757+0.629655I$ $b=\ \ 0.04950-1.56385I$	$18.9593+3.2843I$	0
$u=\ \ 1.76755+0.03169I$ $a=\ \ 1.88452-0.11380I$ $b=-1.56905-0.21871I$	$16.9501+1.9651I$	0
$u=\ \ 1.76755-0.03169I$ $a=\ \ 1.88452+0.11380I$ $b=-1.56905+0.21871I$	$16.9501-1.9651I$	0
$u=\ \ 1.77210+0.10705I$ $a=-1.71021+0.26961I$ $b=\ \ 1.61742+0.71877I$	$-15.5908+11.3747I$	0
$u=\ \ 1.77210-0.10705I$ $a=-1.71021-0.26961I$ $b=\ \ 1.61742-0.71877I$	$-15.5908-11.3747I$	0
$u=-0.042751+0.219509I$ $a=-0.63189+2.24770I$ $b=\ \ 0.311409+0.398108I$	$-1.261040-0.319837I$	$-6.08687+0.82925I$
$u=-0.042751-0.219509I$ $a=-0.63189-2.24770I$ $b=\ \ 0.311409-0.398108I$	$-1.261040+0.319837I$	$-6.08687-0.82925I$
$u=\ \ 1.78078+0.09884I$ $a=\ \ 1.71959-0.23944I$ $b=-1.67156-0.66408I$	$-15.0724+4.7212I$	0
$u=\ \ 1.78078-0.09884I$ $a=\ \ 1.71959+0.23944I$ $b=-1.67156+0.66408I$	$-15.0724-4.7212I$	0

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

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} a \\ 0 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} au \\ -au + a \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -a^2u + a^2 - u \\ 2a^2u - a^2 + u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} a \\ 0 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 10a^2u - 9a^2 + 6au - a + 3u - 1$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = 0.922021$ $b = 0$	-0.126494	0.954070
$u = 0.618034$ $a = 0.34801 + 2.11500I$ $b = 0$	$4.01109 - 2.82812I$	$14.0681 + 1.5771I$
$u = 0.618034$ $a = 0.34801 - 2.11500I$ $b = 0$	$4.01109 + 2.82812I$	$14.0681 - 1.5771I$
$u = -1.61803$ $a = -0.132927 + 0.807858I$ $b = 0$	$11.90680 + 2.82812I$	$11.55793 - 3.24268I$
$u = -1.61803$ $a = -0.132927 - 0.807858I$ $b = 0$	$11.90680 - 2.82812I$	$11.55793 + 3.24268I$
$u = -1.61803$ $a = -0.352181$ $b = 0$	7.76919	-5.20600

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

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

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

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

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

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, 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
$u = -1.00000$ $a = \quad 2.00000$ $b = -1.00000$	1.64493	6.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4	$(u+1)(u^3-u^2+2u-1)^2(u^{39}+8u^{38}+\cdots+42u+1)$
c_2	$(u+1)(u^3+u^2-1)^2(u^{39}+2u^{38}+\cdots-6u+1)$
c_3, c_{10}	$u^6(u-1)(u^{39}+2u^{38}+\cdots-160u-64)$
c_5	$(u+1)(u^3-u^2+1)^2(u^{39}+2u^{38}+\cdots-6u+1)$
c_6	$(u+1)(u^3+u^2+2u+1)^2(u^{39}+8u^{38}+\cdots+42u+1)$
c_7, c_8, c_9	$(u+1)(u^2-u-1)^3(u^{39}-5u^{38}+\cdots-u+1)$
c_{11}, c_{12}	$(u+1)(u^2+u-1)^3(u^{39}-5u^{38}+\cdots-u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6	$(y-1)(y^3+3y^2+2y-1)^2(y^{39}+48y^{38}+\cdots+978y-1)$
c_2, c_5	$(y-1)(y^3-y^2+2y-1)^2(y^{39}-8y^{38}+\cdots+42y-1)$
c_3, c_{10}	$y^6(y-1)(y^{39}-34y^{38}+\cdots+25600y-4096)$
c_7, c_8, c_9 c_{11}, c_{12}	$(y-1)(y^2-3y+1)^3(y^{39}-55y^{38}+\cdots-9y-1)$