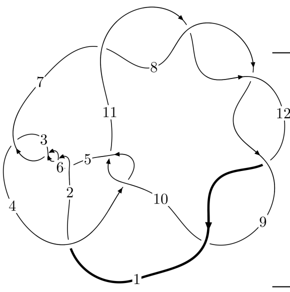
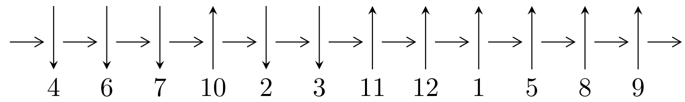
$12a_{0878}$ ($K12a_{0878}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 5u^{35} + 7u^{34} + \cdots + b - 4,\ -2u^{35} - u^{34} + \cdots + 2a + 13,\ u^{36} + 3u^{35} + \cdots + 6u - 1\rangle$$
$$I_2^u = \langle b,\ a - u + 2,\ u^2 - u - 1\rangle$$
$$I_3^u = \langle b - 1,\ -u^3 + a + 2u + 1,\ u^4 - u^3 - 2u^2 + 2u - 1\rangle$$
$$I_4^u = \langle b - 1,\ a,\ u + 1\rangle$$
$$I_5^u = \langle b,\ a - 1,\ u^2 - u - 1\rangle$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 45 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.

$$\boldsymbol{I^u_1 = \langle 5u^{35}+7u^{34}+\cdots+b-4,\ -2u^{35}-u^{34}+\cdots+2a+13,\ u^{36}+3u^{35}+\cdots+6u-1\rangle}$$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u \\ -u^3+u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^2+1 \\ -u^4+2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^{35}+\frac{1}{2}u^{34}+\cdots+\frac{27}{2}u-\frac{13}{2} \\ -5u^{35}-7u^{34}+\cdots-23u+4 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -4u^{35}-\frac{13}{2}u^{34}+\cdots-\frac{19}{2}u-\frac{5}{2} \\ -5u^{35}-7u^{34}+\cdots-23u+4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -\frac{1}{2}u^{34}-u^{33}+\cdots+\frac{11}{2}u+\frac{3}{2} \\ -u^9+5u^7-7u^5+2u^3-u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^3-2u \\ u^5-3u^3+u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^7-4u^5+4u^3 \\ u^9-5u^7+7u^5-2u^3+u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{2}u^{35}-u^{34}+\cdots+\frac{21}{2}u-6 \\ -\frac{1}{2}u^{35}-\frac{1}{2}u^{34}+\cdots-u+\frac{1}{2} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.500000u^{35}+10.5000u^{33}+\cdots-16.5000u^2-9.50000u \\ -\frac{1}{2}u^{35}-\frac{1}{2}u^{34}+\cdots-u+\frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{15}{2}u^{35}+13u^{34}+\cdots+\frac{137}{2}u+4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{36} - 7u^{35} + \cdots - 204u - 7$
c_2, c_3, c_5 c_6	$u^{36} + 3u^{35} + \cdots + 6u - 1$
c_4, c_{10}	$u^{36} + 4u^{35} + \cdots + 80u + 16$
c_7, c_8, c_9 c_{11}, c_{12}	$u^{36} - 3u^{35} + \cdots - 12u^2 - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{36} + 19y^{35} + \cdots - 24116y + 49$
c_2, c_3, c_5 c_6	$y^{36} - 41y^{35} + \cdots - 56y + 1$
c_4, c_{10}	$y^{36} - 20y^{35} + \cdots - 3200y + 256$
c_7, c_8, c_9 c_{11}, c_{12}	$y^{36} - 49y^{35} + \cdots + 24y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.680450 + 0.624888I$ $a = 1.58464 + 1.12498I$ $b = -1.37928 + 0.58427I$	$15.3018 - 8.1184I$	$7.62644 + 5.89402I$
$u = 0.680450 - 0.624888I$ $a = 1.58464 - 1.12498I$ $b = -1.37928 - 0.58427I$	$15.3018 + 8.1184I$	$7.62644 - 5.89402I$
$u = 0.634805 + 0.572486I$ $a = -1.68198 - 1.14140I$ $b = 1.250780 - 0.467984I$	$5.35265 - 6.44473I$	$7.06333 + 7.49999I$
$u = 0.634805 - 0.572486I$ $a = -1.68198 + 1.14140I$ $b = 1.250780 + 0.467984I$	$5.35265 + 6.44473I$	$7.06333 - 7.49999I$
$u = 0.286743 + 0.718481I$ $a = -1.61383 - 0.66499I$ $b = 1.41214 + 0.42853I$	$16.4706 + 3.6258I$	$9.89093 - 0.70806I$
$u = 0.286743 - 0.718481I$ $a = -1.61383 + 0.66499I$ $b = 1.41214 - 0.42853I$	$16.4706 - 3.6258I$	$9.89093 + 0.70806I$
$u = -1.216880 + 0.225154I$ $a = 0.176584 - 0.371182I$ $b = -1.374430 + 0.160487I$	$11.69880 - 0.20082I$	$6.33515 + 0.I$
$u = -1.216880 - 0.225154I$ $a = 0.176584 + 0.371182I$ $b = -1.374430 - 0.160487I$	$11.69880 + 0.20082I$	$6.33515 + 0.I$
$u = 0.556839 + 0.497955I$ $a = 1.87783 + 1.11937I$ $b = -1.079090 + 0.293810I$	$1.19518 - 3.43864I$	$3.32627 + 7.55199I$
$u = 0.556839 - 0.497955I$ $a = 1.87783 - 1.11937I$ $b = -1.079090 - 0.293810I$	$1.19518 + 3.43864I$	$3.32627 - 7.55199I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.488097 + 0.539433I$ $a = -0.755389 - 0.156628I$ $b = -0.139231 + 1.154510I$	$11.32400 + 1.86563I$	$6.84113 - 3.39356I$
$u = -0.488097 - 0.539433I$ $a = -0.755389 + 0.156628I$ $b = -0.139231 - 1.154510I$	$11.32400 - 1.86563I$	$6.84113 + 3.39356I$
$u = 0.302987 + 0.626688I$ $a = 1.73596 + 0.65197I$ $b = -1.228520 - 0.302969I$	$6.32076 + 2.37657I$	$9.77017 - 1.34852I$
$u = 0.302987 - 0.626688I$ $a = 1.73596 - 0.65197I$ $b = -1.228520 + 0.302969I$	$6.32076 - 2.37657I$	$9.77017 + 1.34852I$
$u = -0.482616 + 0.407041I$ $a = 0.667048 - 0.013183I$ $b = 0.156607 - 0.892042I$	$1.87081 + 1.46712I$	$6.30394 - 4.92073I$
$u = -0.482616 - 0.407041I$ $a = 0.667048 + 0.013183I$ $b = 0.156607 + 0.892042I$	$1.87081 - 1.46712I$	$6.30394 + 4.92073I$
$u = -0.603920 + 0.151230I$ $a = -0.257154 + 0.105987I$ $b = -0.288863 + 0.427112I$	$-1.107760 + 0.363241I$	$-6.95847 - 1.67967I$
$u = -0.603920 - 0.151230I$ $a = -0.257154 - 0.105987I$ $b = -0.288863 - 0.427112I$	$-1.107760 - 0.363241I$	$-6.95847 + 1.67967I$
$u = -1.38180$ $a = -0.715291$ $b = 1.22298$	1.39348	6.13670
$u = -1.52012 + 0.10884I$ $a = 1.040470 - 0.777211I$ $b = -1.121760 - 0.323243I$	$-4.81513 + 1.90456I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.52012 - 0.10884I$ $a = 1.040470 + 0.777211I$ $b = -1.121760 + 0.323243I$	$-4.81513 - 1.90456I$	0
$u = 1.52376 + 0.14580I$ $a = 0.388481 + 0.623220I$ $b = 0.395969 + 1.220420I$	$4.64948 - 4.27120I$	0
$u = 1.52376 - 0.14580I$ $a = 0.388481 - 0.623220I$ $b = 0.395969 - 1.220420I$	$4.64948 + 4.27120I$	0
$u = 1.54036 + 0.09785I$ $a = -0.291616 - 0.548274I$ $b = -0.355163 - 1.046370I$	$-4.96649 - 3.17823I$	0
$u = 1.54036 - 0.09785I$ $a = -0.291616 + 0.548274I$ $b = -0.355163 + 1.046370I$	$-4.96649 + 3.17823I$	0
$u = -1.55388 + 0.14251I$ $a = -0.903024 + 1.018170I$ $b = 1.164680 + 0.488851I$	$-5.88929 + 5.74406I$	0
$u = -1.55388 - 0.14251I$ $a = -0.903024 - 1.018170I$ $b = 1.164680 - 0.488851I$	$-5.88929 - 5.74406I$	0
$u = 0.439340$ $a = 3.99822$ $b = -0.448670$	8.22478	19.8310
$u = 1.57896 + 0.04089I$ $a = 0.168039 + 0.376790I$ $b = 0.269429 + 0.728694I$	$-8.61991 - 1.07838I$	0
$u = 1.57896 - 0.04089I$ $a = 0.168039 - 0.376790I$ $b = 0.269429 - 0.728694I$	$-8.61991 + 1.07838I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.57622 + 0.17454I$ $a = 0.742839 - 1.118400I$ $b = -1.254650 - 0.614758I$	$-2.04882 + 9.20350I$	0
$u = -1.57622 - 0.17454I$ $a = 0.742839 + 1.118400I$ $b = -1.254650 + 0.614758I$	$-2.04882 - 9.20350I$	0
$u = -1.59552 + 0.19703I$ $a = -0.638410 + 1.172730I$ $b = 1.32886 + 0.71326I$	$7.68400 + 11.19530I$	0
$u = -1.59552 - 0.19703I$ $a = -0.638410 - 1.172730I$ $b = 1.32886 - 0.71326I$	$7.68400 - 11.19530I$	0
$u = 1.65310$ $a = -0.316454$ $b = -0.667605$	-7.37086	0
$u = 0.154049$ $a = -3.44747$ $b = 0.378377$	0.766693	13.5400

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

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ u + 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u \\ -u - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u - 2 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u - 2 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -3u + 3 \\ -u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u - 3 \\ -1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -2u + 4 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = -2.61803$ $b = 0$	7.89568	−5.00000
$u = 1.61803$ $a = -0.381966$ $b = 0$	−7.89568	−5.00000

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.407392 + 0.476565I$ $a = -2.02474 - 0.82408I$ $b = 1.00000$	1.64493	6.00000
$u = 0.407392 - 0.476565I$ $a = -2.02474 + 0.82408I$ $b = 1.00000$	1.64493	6.00000
$u = -1.50507$ $a = -1.39919$ $b = 1.00000$	1.64493	6.00000
$u = 1.69028$ $a = 0.448678$ $b = 1.00000$	1.64493	6.00000

IV. $I_4^u = \langle b-1,\ a,\ u+1 \rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

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

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

$$a_7 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

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

$$a_8 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} -1 \\ -2 \end{pmatrix}$$

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

$$a_{12} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

(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_3 c_5, c_6, c_7 c_8, c_9, c_{11} c_{12}	$u + 1$
c_4, 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_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = 0$ $b = 1.00000$	1.64493	6.00000

V. $I^u_5 = \langle b,\ a-1,\ u^2-u-1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = 1.00000$ $b = 0$	0	0
$u = 1.61803$ $a = 1.00000$ $b = 0$	0	0

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u+1)(u^2+u-1)^2(u^4-3u^3+2u^2-2u+1)$ $\cdot\,(u^{36}-7u^{35}+\cdots-204u-7)$
c_2, c_3	$(u+1)(u^2+u-1)^2(u^4-u^3+\cdots+2u-1)(u^{36}+3u^{35}+\cdots+6u-1)$
c_4, c_{10}	$u^4(u-1)^5(u^{36}+4u^{35}+\cdots+80u+16)$
c_5, c_6	$(u+1)(u^2-u-1)^2(u^4-u^3+\cdots+2u-1)(u^{36}+3u^{35}+\cdots+6u-1)$
c_7, c_8, c_9	$(u+1)(u^2-u-1)^2(u^4-u^3+\cdots+2u-1)(u^{36}-3u^{35}+\cdots-12u^2-1)$
c_{11}, c_{12}	$(u+1)(u^2+u-1)^2(u^4-u^3+\cdots+2u-1)(u^{36}-3u^{35}+\cdots-12u^2-1)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)(y^2-3y+1)^2(y^4-5y^3-6y^2+1)$ $\cdot\,(y^{36}+19y^{35}+\cdots-24116y+49)$
c_2, c_3, c_5 c_6	$(y-1)(y^2-3y+1)^2(y^4-5y^3+6y^2+1)(y^{36}-41y^{35}+\cdots-56y+1)$
c_4, c_{10}	$y^4(y-1)^5(y^{36}-20y^{35}+\cdots-3200y+256)$
c_7, c_8, c_9 c_{11}, c_{12}	$(y-1)(y^2-3y+1)^2(y^4-5y^3+6y^2+1)(y^{36}-49y^{35}+\cdots+24y+1)$