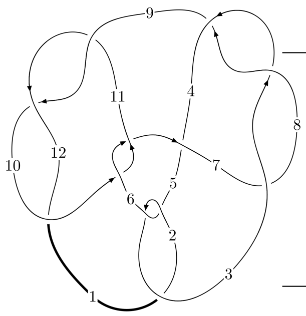
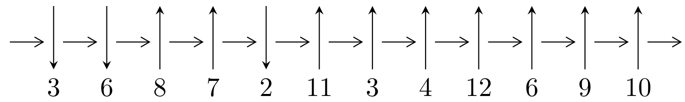
$12n_{0344}$ ($K12n_{0344}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -1.57884 \times 10^{37} u^{43} + 4.19415 \times 10^{37} u^{42} + \cdots + 3.14492 \times 10^{36} b + 2.00463 \times 10^{38},$$
$$5.51340 \times 10^{37} u^{43} - 1.47280 \times 10^{38} u^{42} + \cdots + 3.14492 \times 10^{36} a - 7.82161 \times 10^{38},\ u^{44} - 3u^{43} + \cdots - 36u +$$

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

$$I_1^v = \langle a,\ b + v - 2,\ v^2 - 3v + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 50 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. $\boldsymbol{I^u_1 = \langle -1.58\times 10^{37}u^{43} + 4.19\times 10^{37}u^{42} + \cdots + 3.14\times 10^{36}b + 2.00\times 10^{38},\ 5.51\times 10^{37}u^{43} - 1.47\times 10^{38}u^{42} + \cdots + 3.14\times 10^{36}a - 7.82\times 10^{38},\ u^{44} - 3u^{43} + \cdots - 36u + 4\rangle}$

(i) Arc colorings

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

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

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

$$a_4 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$

$$a_9 = \begin{pmatrix}-u^2+1\\u^4-2u^2\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}-17.5312u^{43} + 46.8311u^{42} + \cdots - 1316.37u + 248.706\\5.02029u^{43} - 13.3363u^{42} + \cdots + 367.657u - 63.7420\end{pmatrix}$$

$$a_6 = \begin{pmatrix}3.47461u^{43} - 10.7515u^{42} + \cdots + 355.136u - 74.5401\\-1.68885u^{43} + 5.62072u^{42} + \cdots - 173.747u + 30.1506\end{pmatrix}$$

$$a_2 = \begin{pmatrix}-9.86564u^{43} + 26.8155u^{42} + \cdots - 755.031u + 138.369\\-4.70217u^{43} + 10.4432u^{42} + \cdots - 226.148u + 33.6781\end{pmatrix}$$

$$a_1 = \begin{pmatrix}-9.86564u^{43} + 26.8155u^{42} + \cdots - 755.031u + 138.369\\-4.03012u^{43} + 8.38511u^{42} + \cdots - 165.479u + 22.5523\end{pmatrix}$$

$$a_5 = \begin{pmatrix}-u^3+2u\\-u^3+u\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}-19.4067u^{43} + 52.8978u^{42} + \cdots - 1495.34u + 274.133\\-4.36737u^{43} + 8.86394u^{42} + \cdots - 164.017u + 21.4464\end{pmatrix}$$

$$a_{12} = \begin{pmatrix}-15.0159u^{43} + 40.6500u^{42} + \cdots - 1164.20u + 225.930\\5.45610u^{43} - 13.6789u^{42} + \cdots + 357.423u - 61.0333\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -58.5401u^{43} + 159.424u^{42} + \cdots - 4534.07u + 846.150$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{44} + 45u^{43} + \cdots + 4203u + 81$
c_2, c_5	$u^{44} + 3u^{43} + \cdots + 21u - 9$
c_3, c_7, c_8	$u^{44} - 3u^{43} + \cdots - 36u + 4$
c_4	$u^{44} + 9u^{43} + \cdots + 1500u - 964$
c_6, c_{10}	$u^{44} + 2u^{43} + \cdots + 10u + 1$
c_9, c_{11}, c_{12}	$u^{44} + 4u^{43} + \cdots - 18u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{44} - 85y^{43} + \cdots - 6110883y + 6561$
c_2, c_5	$y^{44} - 45y^{43} + \cdots - 4203y + 81$
c_3, c_7, c_8	$y^{44} - 39y^{43} + \cdots - 368y + 16$
c_4	$y^{44} + 21y^{43} + \cdots - 41187888y + 929296$
c_6, c_{10}	$y^{44} - 12y^{43} + \cdots - 58y + 1$
c_9, c_{11}, c_{12}	$y^{44} - 36y^{43} + \cdots - 242y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.361562 + 0.932667I$ $a = 0.23727 - 1.40400I$ $b = 0.961486 - 1.024300I$	$-4.54866 - 9.17617I$	$5.81808 + 6.48451I$
$u = -0.361562 - 0.932667I$ $a = 0.23727 + 1.40400I$ $b = 0.961486 + 1.024300I$	$-4.54866 + 9.17617I$	$5.81808 - 6.48451I$
$u = 0.242419 + 0.963914I$ $a = 0.542404 + 0.771039I$ $b = 0.650253 + 0.479584I$	$2.03227 + 3.85207I$	$10.41827 - 8.61488I$
$u = 0.242419 - 0.963914I$ $a = 0.542404 - 0.771039I$ $b = 0.650253 - 0.479584I$	$2.03227 - 3.85207I$	$10.41827 + 8.61488I$
$u = -0.155342 + 0.896950I$ $a = -0.31935 + 1.38694I$ $b = -0.99704 + 1.03670I$	$-8.52514 - 3.75610I$	$2.09209 + 2.89832I$
$u = -0.155342 - 0.896950I$ $a = -0.31935 - 1.38694I$ $b = -0.99704 - 1.03670I$	$-8.52514 + 3.75610I$	$2.09209 - 2.89832I$
$u = 1.125730 + 0.043899I$ $a = 0.058942 + 0.745233I$ $b = 0.556341 + 0.553872I$	$1.99922 - 0.04818I$	$6.00000 + 0.I$
$u = 1.125730 - 0.043899I$ $a = 0.058942 - 0.745233I$ $b = 0.556341 - 0.553872I$	$1.99922 + 0.04818I$	$6.00000 + 0.I$
$u = -0.851420 + 0.746270I$ $a = -0.677609 - 0.190566I$ $b = -0.609425 - 0.874938I$	$-3.05540 + 3.53185I$	$6.00000 + 0.I$
$u = -0.851420 - 0.746270I$ $a = -0.677609 + 0.190566I$ $b = -0.609425 + 0.874938I$	$-3.05540 - 3.53185I$	$6.00000 + 0.I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.060206 + 0.789681I$ $a = 0.420124 - 1.337940I$ $b = 1.05150 - 1.02729I$	$-4.31168 + 1.72166I$	$4.04968 - 1.22187I$
$u = 0.060206 - 0.789681I$ $a = 0.420124 + 1.337940I$ $b = 1.05150 + 1.02729I$	$-4.31168 - 1.72166I$	$4.04968 + 1.22187I$
$u = -1.104880 + 0.498321I$ $a = 0.424315 + 0.083138I$ $b = 0.625620 + 1.104260I$	$-5.61992 - 1.18304I$	0
$u = -1.104880 - 0.498321I$ $a = 0.424315 - 0.083138I$ $b = 0.625620 - 1.104260I$	$-5.61992 + 1.18304I$	0
$u = 1.22068$ $a = -1.07819$ $b = 1.88874$	10.3320	0
$u = 1.218830 + 0.333934I$ $a = 1.13833 - 0.87054I$ $b = -1.31850 - 0.66505I$	$-0.76043 + 2.33473I$	0
$u = 1.218830 - 0.333934I$ $a = 1.13833 + 0.87054I$ $b = -1.31850 + 0.66505I$	$-0.76043 - 2.33473I$	0
$u = -1.271900 + 0.268067I$ $a = -0.553133 - 1.124420I$ $b = 0.895901 - 0.644934I$	$2.75377 - 4.58010I$	0
$u = -1.271900 - 0.268067I$ $a = -0.553133 + 1.124420I$ $b = 0.895901 + 0.644934I$	$2.75377 + 4.58010I$	0
$u = -1.305420 + 0.064505I$ $a = 1.20456 + 0.91583I$ $b = -0.813618 + 0.359887I$	$5.20530 - 0.47373I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.305420 - 0.064505I$ $a = 1.20456 - 0.91583I$ $b = -0.813618 - 0.359887I$	$5.20530 + 0.47373I$	0
$u = 1.310900 + 0.166284I$ $a = -0.028578 + 0.886239I$ $b = -0.526233 + 0.907268I$	$5.87917 + 2.87968I$	0
$u = 1.310900 - 0.166284I$ $a = -0.028578 - 0.886239I$ $b = -0.526233 - 0.907268I$	$5.87917 - 2.87968I$	0
$u = -1.310400 + 0.345353I$ $a = -0.233101 - 0.138958I$ $b = -0.79762 - 1.32164I$	$-0.02123 - 5.81626I$	0
$u = -1.310400 - 0.345353I$ $a = -0.233101 + 0.138958I$ $b = -0.79762 + 1.32164I$	$-0.02123 + 5.81626I$	0
$u = -1.39785$ $a = 8.91764$ $b = -0.188474$	4.90257	0
$u = -0.006322 + 0.581193I$ $a = -0.89655 - 1.33079I$ $b = -0.503249 - 0.484782I$	$-1.17226 + 1.37524I$	$0.82630 - 4.37313I$
$u = -0.006322 - 0.581193I$ $a = -0.89655 + 1.33079I$ $b = -0.503249 + 0.484782I$	$-1.17226 - 1.37524I$	$0.82630 + 4.37313I$
$u = 1.37514 + 0.39616I$ $a = -0.881677 + 1.000200I$ $b = 1.24438 + 0.87011I$	$-3.70647 + 8.39508I$	0
$u = 1.37514 - 0.39616I$ $a = -0.881677 - 1.000200I$ $b = 1.24438 - 0.87011I$	$-3.70647 - 8.39508I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.33260 + 0.53021I$ $a = -0.126765 - 0.487206I$ $b = -0.626528 - 0.301390I$	$5.26881 + 2.02524I$	0
$u = 1.33260 - 0.53021I$ $a = -0.126765 + 0.487206I$ $b = -0.626528 + 0.301390I$	$5.26881 - 2.02524I$	0
$u = 1.45079$ $a = 0.972042$ $b = -0.251576$	3.37301	0
$u = -1.45928$ $a = -0.521642$ $b = 1.51795$	13.6404	0
$u = -1.41359 + 0.38694I$ $a = 0.320048 + 0.993129I$ $b = -0.997773 + 0.724464I$	$7.26218 - 8.61162I$	0
$u = -1.41359 - 0.38694I$ $a = 0.320048 - 0.993129I$ $b = -0.997773 - 0.724464I$	$7.26218 + 8.61162I$	0
$u = 1.48503 + 0.37724I$ $a = 0.730260 - 1.019420I$ $b = -1.20624 - 0.98697I$	$1.34332 + 13.91980I$	0
$u = 1.48503 - 0.37724I$ $a = 0.730260 + 1.019420I$ $b = -1.20624 + 0.98697I$	$1.34332 - 13.91980I$	0
$u = -0.115716 + 0.402697I$ $a = -0.38670 + 2.62883I$ $b = 0.377022 + 0.479190I$	$1.42746 - 0.71018I$	$6.25077 - 1.25816I$
$u = -0.115716 - 0.402697I$ $a = -0.38670 - 2.62883I$ $b = 0.377022 - 0.479190I$	$1.42746 + 0.71018I$	$6.25077 + 1.25816I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.339286$ $a = -1.00783$ $b = -1.53932$	7.49147	26.0080
$u = 0.302786$ $a = -0.689575$ $b = 0.583905$	0.759214	14.0520
$u = 0.266557$ $a = 9.48986$ $b = -0.525421$	−0.455563	39.4620
$u = 1.76844$ $a = -0.0279231$ $b = 0.581616$	6.40427	0

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

(i) Arc colorings

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

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

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

$$a_4 = \begin{pmatrix} u \\ -u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} a \\ -au - 2a - 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{2}u \\ au + 2a + 2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u \\ au + 2a + u + 2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u \\ au + 2a + 2 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} au + 2a + \frac{1}{2}u \\ au + 2a + 2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -au - a - 1 \\ -au - 2a - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.41421$ $a = -0.473911$ $b = 0.618034$	4.27683	12.0000
$u = 1.41421$ $a = 0.181018$ $b = -1.61803$	12.1725	12.0000
$u = -1.41421$ $a = 1.05505$ $b = -1.61803$	12.1725	12.0000
$u = -1.41421$ $a = -2.76216$ $b = 0.618034$	4.27683	12.0000

III. $I_1^v = \langle a,\ b + v - 2,\ v^2 - 3v + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 0.381966$ $a = 0$ $b = 1.61803$	7.23771	−6.00000
$v = 2.61803$ $a = 0$ $b = -0.618034$	−0.657974	−6.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^6)(u^{44}+45u^{43}+\cdots+4203u+81)$
c_2	$((u-1)^2)(u+1)^4(u^{44}+3u^{43}+\cdots+21u-9)$
c_3, c_7, c_8	$u^2(u^2-2)^2(u^{44}-3u^{43}+\cdots-36u+4)$
c_4	$u^2(u^2-2)^2(u^{44}+9u^{43}+\cdots+1500u-964)$
c_5	$((u-1)^4)(u+1)^2(u^{44}+3u^{43}+\cdots+21u-9)$
c_6	$(u^2-u-1)(u^2+u-1)^2(u^{44}+2u^{43}+\cdots+10u+1)$
c_9	$((u^2-u-1)^3)(u^{44}+4u^{43}+\cdots-18u+1)$
c_{10}	$((u^2-u-1)^2)(u^2+u-1)(u^{44}+2u^{43}+\cdots+10u+1)$
c_{11}, c_{12}	$((u^2+u-1)^3)(u^{44}+4u^{43}+\cdots-18u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^6)(y^{44}-85y^{43}+\cdots-6110883y+6561)$
c_2, c_5	$((y-1)^6)(y^{44}-45y^{43}+\cdots-4203y+81)$
c_3, c_7, c_8	$y^2(y-2)^4(y^{44}-39y^{43}+\cdots-368y+16)$
c_4	$y^2(y-2)^4(y^{44}+21y^{43}+\cdots-4.11879\times10^7y+929296)$
c_6, c_{10}	$((y^2-3y+1)^3)(y^{44}-12y^{43}+\cdots-58y+1)$
c_9, c_{11}, c_{12}	$((y^2-3y+1)^3)(y^{44}-36y^{43}+\cdots-242y+1)$