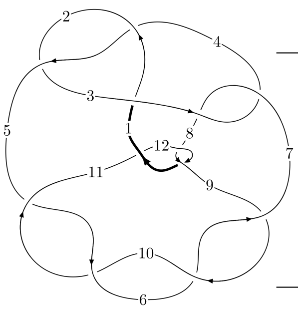
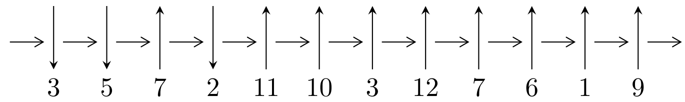
$12n_{0216}$ $(K12n_{0216})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -4.21983 \times 10^{23} u^{45} - 8.41658 \times 10^{23} u^{44} + \cdots + 1.74819 \times 10^{25} b + 1.68172 \times 10^{25},$$
$$5.61193 \times 10^{25} u^{45} + 9.57494 \times 10^{25} u^{44} + \cdots + 5.24457 \times 10^{25} a - 1.61715 \times 10^{26},\ u^{46} + 2u^{45} + \cdots - 2u - 1$$
$$I_2^u = \langle b + 1,\ -4u^4 - 3u^3 - 16u^2 + 3a - 8u - 10,\ u^5 + u^4 + 4u^3 + 3u^2 + 3u + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 51 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.

$$\boldsymbol{I_1^u = \langle -4.22\times 10^{23}u^{45} - 8.42\times 10^{23}u^{44} + \cdots + 1.75\times 10^{25}b + 1.68\times 10^{25},\ 5.61\times 10^{25}u^{45} + 9.57\times 10^{25}u^{44} + \cdots + 5.24\times 10^{25}a - 1.62\times 10^{26},\ u^{46} + 2u^{45} + \cdots - 2u - 1\rangle}$$

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} -1.07005u^{45} - 1.82569u^{44} + \cdots + 0.723738u + 3.08347 \\ 0.0241383u^{45} + 0.0481445u^{44} + \cdots + 0.143640u - 0.961979 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -1.04591u^{45} - 1.77754u^{44} + \cdots + 0.867378u + 2.12149 \\ 0.0241383u^{45} + 0.0481445u^{44} + \cdots + 0.143640u - 0.961979 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.0994285u^{45} + 0.221105u^{44} + \cdots + 1.08052u - 0.717471 \\ -0.00754267u^{45} - 0.0219064u^{44} + \cdots - 0.248343u - 0.0694190 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -1.07052u^{45} - 1.81843u^{44} + \cdots + 0.520366u + 3.00463 \\ 0.0354011u^{45} + 0.0802965u^{44} + \cdots + 0.198435u - 0.928318 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.165056u^{45} + 0.387185u^{44} + \cdots + 0.706572u - 0.840882 \\ -0.0901646u^{45} - 0.201814u^{44} + \cdots - 0.153596u - 0.00307950 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^3 - 2u \\ u^5 + 3u^3 + u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.0405799u^{45} + 0.0527587u^{44} + \cdots + 0.527814u - 0.594467 \\ 0.0262559u^{45} + 0.0868893u^{44} + \cdots + 0.292290u - 0.0473460 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{1370318465142904033958445549}{5244566690211026152701909 9}u^{45} - \frac{18786395268836299324473694}{524456669021102615270190 99}u^{44} + \cdots - \frac{33906075828265986778746236 6}{524456669021102615270190 99}u + \frac{58812649637857441022716634 0}{524456669021102615270190 99}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{46} + 18u^{45} + \cdots + 7846u + 81$
c_2, c_4	$u^{46} - 6u^{45} + \cdots + 130u - 9$
c_3, c_7	$u^{46} - 3u^{45} + \cdots - 1536u + 288$
c_5, c_6, c_9 c_{10}	$u^{46} + 2u^{45} + \cdots - 2u - 1$
c_8, c_{12}	$u^{46} - 2u^{45} + \cdots - 2u + 1$
c_{11}	$u^{46} - 26u^{45} + \cdots + 12u^2 + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{46} + 26y^{45} + \cdots - 38928154y + 6561$
c_2, c_4	$y^{46} - 18y^{45} + \cdots - 7846y + 81$
c_3, c_7	$y^{46} - 33y^{45} + \cdots - 1930752y + 82944$
c_5, c_6, c_9 c_{10}	$y^{46} + 50y^{45} + \cdots - 32y^2 + 1$
c_8, c_{12}	$y^{46} - 26y^{45} + \cdots + 12y^2 + 1$
c_{11}	$y^{46} - 10y^{45} + \cdots + 24y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.259312 + 1.012880I$ $a = 0.498291 + 0.227894I$ $b = 0.517237 - 0.014608I$	$-2.49534 + 2.30202I$	$6.60083 - 3.93064I$
$u = 0.259312 - 1.012880I$ $a = 0.498291 - 0.227894I$ $b = 0.517237 + 0.014608I$	$-2.49534 - 2.30202I$	$6.60083 + 3.93064I$
$u = -0.710586 + 0.602137I$ $a = 0.01222 - 1.76555I$ $b = 1.154920 + 0.784082I$	$4.96953 - 10.55700I$	$6.43149 + 8.05936I$
$u = -0.710586 - 0.602137I$ $a = 0.01222 + 1.76555I$ $b = 1.154920 - 0.784082I$	$4.96953 + 10.55700I$	$6.43149 - 8.05936I$
$u = 0.675679 + 0.631174I$ $a = 0.24305 + 1.51831I$ $b = 0.978521 - 0.692213I$	$1.56779 + 5.03517I$	$4.14094 - 5.54867I$
$u = 0.675679 - 0.631174I$ $a = 0.24305 - 1.51831I$ $b = 0.978521 + 0.692213I$	$1.56779 - 5.03517I$	$4.14094 + 5.54867I$
$u = -0.758697 + 0.431488I$ $a = -1.026110 + 0.552682I$ $b = 1.013380 - 0.770093I$	$5.47973 + 5.67003I$	$7.65149 - 3.29521I$
$u = -0.758697 - 0.431488I$ $a = -1.026110 - 0.552682I$ $b = 1.013380 + 0.770093I$	$5.47973 - 5.67003I$	$7.65149 + 3.29521I$
$u = -0.622930 + 0.576977I$ $a = 0.72635 - 1.68752I$ $b = 0.746113 + 0.878089I$	$6.32199 - 0.44657I$	$8.55736 + 2.63861I$
$u = -0.622930 - 0.576977I$ $a = 0.72635 + 1.68752I$ $b = 0.746113 - 0.878089I$	$6.32199 + 0.44657I$	$8.55736 - 2.63861I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.715782 + 0.374629I$ $a = -0.681475 - 0.671267I$ $b = 0.733462 + 0.712339I$	$2.32069 - 0.37269I$	$6.25841 - 0.23771I$
$u = 0.715782 - 0.374629I$ $a = -0.681475 + 0.671267I$ $b = 0.733462 - 0.712339I$	$2.32069 + 0.37269I$	$6.25841 + 0.23771I$
$u = -0.655218 + 0.438720I$ $a = -0.759960 + 1.146150I$ $b = 0.597845 - 1.070520I$	$6.73467 - 3.88264I$	$9.37340 + 4.32110I$
$u = -0.655218 - 0.438720I$ $a = -0.759960 - 1.146150I$ $b = 0.597845 + 1.070520I$	$6.73467 + 3.88264I$	$9.37340 - 4.32110I$
$u = 0.368893 + 0.464171I$ $a = 0.53754 - 1.74308I$ $b = -0.708048 + 0.784129I$	$0.40598 + 3.67404I$	$5.21749 - 9.21180I$
$u = 0.368893 - 0.464171I$ $a = 0.53754 + 1.74308I$ $b = -0.708048 - 0.784129I$	$0.40598 - 3.67404I$	$5.21749 + 9.21180I$
$u = 0.05290 + 1.42813I$ $a = 0.72501 - 2.48091I$ $b = -0.789579 + 0.086473I$	$-4.45315 + 0.20583I$	0
$u = 0.05290 - 1.42813I$ $a = 0.72501 + 2.48091I$ $b = -0.789579 - 0.086473I$	$-4.45315 - 0.20583I$	0
$u = 0.19161 + 1.43230I$ $a = -0.062200 - 0.309987I$ $b = 0.325781 + 0.842227I$	$-3.38050 + 2.83012I$	0
$u = 0.19161 - 1.43230I$ $a = -0.062200 + 0.309987I$ $b = 0.325781 - 0.842227I$	$-3.38050 - 2.83012I$	0

Solutions to I^u_1	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.27356 + 1.44035I$ $a = -0.140805 - 0.034476I$ $b = 0.811531 - 0.701279I$	$-0.51754 + 1.93209I$	0
$u = -0.27356 - 1.44035I$ $a = -0.140805 + 0.034476I$ $b = 0.811531 + 0.701279I$	$-0.51754 - 1.93209I$	0
$u = -0.05653 + 1.48759I$ $a = -0.480692 + 0.975143I$ $b = -1.162780 - 0.588341I$	$-7.90348 - 1.78350I$	0
$u = -0.05653 - 1.48759I$ $a = -0.480692 - 0.975143I$ $b = -1.162780 + 0.588341I$	$-7.90348 + 1.78350I$	0
$u = -0.105822 + 0.496599I$ $a = 0.191381 + 0.934900I$ $b = -1.291070 - 0.220220I$	$-2.01082 - 1.28906I$	$-0.35608 + 4.03643I$
$u = -0.105822 - 0.496599I$ $a = 0.191381 - 0.934900I$ $b = -1.291070 + 0.220220I$	$-2.01082 + 1.28906I$	$-0.35608 - 4.03643I$
$u = -0.20014 + 1.48162I$ $a = -0.340642 + 0.355766I$ $b = 0.448756 - 1.274480I$	$0.49598 - 6.93601I$	0
$u = -0.20014 - 1.48162I$ $a = -0.340642 - 0.355766I$ $b = 0.448756 + 1.274480I$	$0.49598 + 6.93601I$	0
$u = 0.09377 + 1.49931I$ $a = -0.230681 - 0.883359I$ $b = -0.93270 + 1.07583I$	$-6.07967 + 5.26868I$	0
$u = 0.09377 - 1.49931I$ $a = -0.230681 + 0.883359I$ $b = -0.93270 - 1.07583I$	$-6.07967 - 5.26868I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.01965 + 1.50818I$ $a = -0.640464 + 0.357070I$ $b = -1.60059 - 0.26485I$	$-8.66214 - 1.68025I$	0
$u = -0.01965 - 1.50818I$ $a = -0.640464 - 0.357070I$ $b = -1.60059 + 0.26485I$	$-8.66214 + 1.68025I$	0
$u = 0.379690 + 0.276434I$ $a = 2.90356 - 0.73348I$ $b = -0.621326 - 0.321322I$	$0.91598 - 1.09390I$	$7.82328 - 2.45521I$
$u = 0.379690 - 0.276434I$ $a = 2.90356 + 0.73348I$ $b = -0.621326 + 0.321322I$	$0.91598 + 1.09390I$	$7.82328 + 2.45521I$
$u = -0.234347 + 0.374492I$ $a = 0.49536 + 2.14693I$ $b = -0.906115 - 0.270833I$	$-1.68679 - 0.81939I$	$-2.39555 + 2.24421I$
$u = -0.234347 - 0.374492I$ $a = 0.49536 - 2.14693I$ $b = -0.906115 + 0.270833I$	$-1.68679 + 0.81939I$	$-2.39555 - 2.24421I$
$u = -0.19365 + 1.56498I$ $a = 1.042400 - 0.850177I$ $b = 0.909015 + 0.693734I$	$-0.81497 - 3.43039I$	0
$u = -0.19365 - 1.56498I$ $a = 1.042400 + 0.850177I$ $b = 0.909015 - 0.693734I$	$-0.81497 + 3.43039I$	0
$u = -0.23754 + 1.56315I$ $a = 0.772267 - 1.161680I$ $b = 1.27662 + 0.76890I$	$-2.1712 - 14.0664I$	0
$u = -0.23754 - 1.56315I$ $a = 0.772267 + 1.161680I$ $b = 1.27662 - 0.76890I$	$-2.1712 + 14.0664I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.417366$ $a = 0.532293$ $b = 0.114066$	0.754477	13.4070
$u = 0.22595 + 1.57656I$ $a = 0.789787 + 0.982198I$ $b = 1.160360 - 0.650256I$	$-5.75587 + 8.40053I$	0
$u = 0.22595 - 1.57656I$ $a = 0.789787 - 0.982198I$ $b = 1.160360 + 0.650256I$	$-5.75587 - 8.40053I$	0
$u = -0.314185$ $a = 7.82390$ $b = -1.08256$	-0.443184	35.5340
$u = 0.05348 + 1.71450I$ $a = 0.747709 + 0.114247I$ $b = 0.822911 - 0.071773I$	$-12.22280 + 3.49084I$	0
$u = 0.05348 - 1.71450I$ $a = 0.747709 - 0.114247I$ $b = 0.822911 + 0.071773I$	$-12.22280 - 3.49084I$	0

II.

$$I_2^u = \langle b+1,\ -4u^4-3u^3-16u^2+3a-8u-10,\ u^5+u^4+4u^3+3u^2+3u+1\rangle$$

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} \frac{4}{3}u^4+u^3+\frac{16}{3}u^2+\frac{8}{3}u+\frac{10}{3} \\ -1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{4}{3}u^4+u^3+\frac{16}{3}u^2+\frac{8}{3}u+\frac{7}{3} \\ -1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} \frac{4}{3}u^4+u^3+\frac{16}{3}u^2+\frac{8}{3}u+\frac{10}{3} \\ -1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u^2+1 \\ -u^4-2u^2 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -u^3-2u \\ -u^4-u^3-3u^2-2u-1 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{14}{9}u^4+\frac{11}{3}u^3+\frac{77}{9}u^2+\frac{88}{9}u+\frac{29}{9}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^5$
c_3, c_7	y^5
c_5, c_6, c_9 c_{10}, c_{11}	$y^5+7y^4+16y^3+13y^2+3y-1$
c_8, c_{12}	$y^5-y^4+4y^3-3y^2+3y-1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.233677+0.885557I$ $a=-0.162657+0.410020I$ $b=-1.00000$	$-3.46474-2.21397I$	$-2.77420+4.04289I$
$u=-0.233677-0.885557I$ $a=-0.162657-0.410020I$ $b=-1.00000$	$-3.46474+2.21397I$	$-2.77420-4.04289I$
$u=-0.416284$ $a=\ \ 3.11537$ $b=-1.00000$	-0.762751	0.416710
$u=-0.05818+1.69128I$ $a=-0.728361+0.139255I$ $b=-1.00000$	$-12.60320-3.33174I$	$-7.32304-1.07305I$
$u=-0.05818-1.69128I$ $a=-0.728361-0.139255I$ $b=-1.00000$	$-12.60320+3.33174I$	$-7.32304+1.07305I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^5)(u^{46}+18u^{45}+\cdots+7846u+81)$
c_2	$((u-1)^5)(u^{46}-6u^{45}+\cdots+130u-9)$
c_3, c_7	$u^5(u^{46}-3u^{45}+\cdots-1536u+288)$
c_4	$((u+1)^5)(u^{46}-6u^{45}+\cdots+130u-9)$
c_5, c_6	$(u^5+u^4+4u^3+3u^2+3u+1)(u^{46}+2u^{45}+\cdots-2u-1)$
c_8	$(u^5+u^4-u^2+u+1)(u^{46}-2u^{45}+\cdots-2u+1)$
c_9, c_{10}	$(u^5-u^4+4u^3-3u^2+3u-1)(u^{46}+2u^{45}+\cdots-2u-1)$
c_{11}	$(u^5+u^4+4u^3+3u^2+3u+1)(u^{46}-26u^{45}+\cdots+12u^2+1)$
c_{12}	$(u^5-u^4+u^2+u-1)(u^{46}-2u^{45}+\cdots-2u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^5)(y^{46}+26y^{45}+\cdots-38928154y+6561)$
c_2, c_4	$((y-1)^5)(y^{46}-18y^{45}+\cdots-7846y+81)$
c_3, c_7	$y^5(y^{46}-33y^{45}+\cdots-1930752y+82944)$
c_5, c_6, c_9 c_{10}	$(y^5+7y^4+16y^3+13y^2+3y-1)(y^{46}+50y^{45}+\cdots-32y^2+1)$
c_8, c_{12}	$(y^5-y^4+4y^3-3y^2+3y-1)(y^{46}-26y^{45}+\cdots+12y^2+1)$
c_{11}	$(y^5+7y^4+16y^3+13y^2+3y-1)(y^{46}-10y^{45}+\cdots+24y+1)$