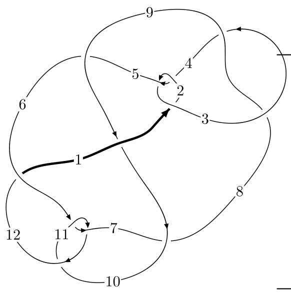
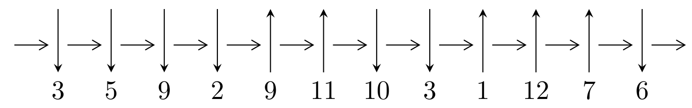
$12n_{0164}$ ($K12n_{0164}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{50} - u^{49} + \cdots - 4u^2 + b,\ -3u^{50} - 3u^{49} + \cdots + a + 4,\ u^{51} + 2u^{50} + \cdots + 6u^2 - 1 \rangle$$
$$I_2^u = \langle b + 1,\ u^7 - 2u^5 + u^4 + 2u^3 - u^2 + a + u,\ u^9 - u^8 - 2u^7 + 3u^6 + u^5 - 3u^4 + 2u^3 - u + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 60 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. $I_1^u =$ $\langle -u^{50}-u^{49}+\cdots-4u^2+b,\ -3u^{50}-3u^{49}+\cdots+a+4,\ u^{51}+2u^{50}+\cdots+6u^2-1\rangle$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^3\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u^3\\u^5-u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^6-u^4+1\\-u^8+2u^6-2u^4\end{pmatrix}$$
$$a_3 = \begin{pmatrix}3u^{50}+3u^{49}+\cdots+15u^2-4\\u^{50}+u^{49}+\cdots+5u^3+4u^2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^{11}+2u^9-2u^7-u^3\\u^{11}-3u^9+4u^7-u^5-u^3+u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}5u^{50}+5u^{49}+\cdots+22u^2-5\\u^{50}+u^{49}+\cdots+5u^2-u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^{22}+5u^{20}-12u^{18}+15u^{16}-10u^{14}+2u^{12}-u^8+u^6-u^4+1\\u^{22}-6u^{20}+17u^{18}-26u^{16}+20u^{14}-13u^{10}+10u^8-u^6-2u^4+u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}2u^{50}+2u^{49}+\cdots+u-3\\u^{50}+u^{49}+\cdots+2u^2+u\end{pmatrix}$$

(ii) Obstruction class $=-1$

(iii) Cusp Shapes $=-10u^{50}-13u^{49}+\cdots-22u+5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{51} + 12u^{50} + \cdots + 8u + 1$
c_2, c_4	$u^{51} - 10u^{50} + \cdots - 8u + 1$
c_3, c_8	$u^{51} + u^{50} + \cdots + 512u + 512$
c_5	$u^{51} - 2u^{50} + \cdots + 2u + 1$
c_6, c_{11}	$u^{51} - 2u^{50} + \cdots - 6u^2 + 1$
c_7, c_{12}	$u^{51} - 6u^{50} + \cdots - 64u + 5$
c_9	$u^{51} + 8u^{50} + \cdots + 20174u - 565$
c_{10}	$u^{51} - 28u^{50} + \cdots + 12u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{51} + 64y^{50} + \cdots + 108y - 1$
c_2, c_4	$y^{51} - 12y^{50} + \cdots + 8y - 1$
c_3, c_8	$y^{51} + 57y^{50} + \cdots - 4194304y - 262144$
c_5	$y^{51} - 60y^{50} + \cdots + 12y - 1$
c_6, c_{11}	$y^{51} - 28y^{50} + \cdots + 12y - 1$
c_7, c_{12}	$y^{51} + 44y^{50} + \cdots + 1176y - 25$
c_9	$y^{51} - 24y^{50} + \cdots + 384067096y - 319225$
c_{10}	$y^{51} - 8y^{50} + \cdots + 72y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.870347 + 0.438821I$ $a = 0.015315 + 0.902084I$ $b = 0.136807 - 0.606788I$	$-0.59383 + 3.47183I$	$-2.57465 - 7.94209I$
$u = 0.870347 - 0.438821I$ $a = 0.015315 - 0.902084I$ $b = 0.136807 + 0.606788I$	$-0.59383 - 3.47183I$	$-2.57465 + 7.94209I$
$u = 0.769432 + 0.540134I$ $a = -0.334413 + 0.181071I$ $b = 0.262412 - 0.045879I$	$-2.41085 + 2.18056I$	$-0.89273 - 4.14337I$
$u = 0.769432 - 0.540134I$ $a = -0.334413 - 0.181071I$ $b = 0.262412 + 0.045879I$	$-2.41085 - 2.18056I$	$-0.89273 + 4.14337I$
$u = -0.918255 + 0.555689I$ $a = 2.35354 - 0.32507I$ $b = 0.33439 + 1.82533I$	$4.75622 - 8.70313I$	$-1.30654 + 7.99573I$
$u = -0.918255 - 0.555689I$ $a = 2.35354 + 0.32507I$ $b = 0.33439 - 1.82533I$	$4.75622 + 8.70313I$	$-1.30654 - 7.99573I$
$u = -0.961040 + 0.526565I$ $a = -2.26543 + 0.37900I$ $b = -0.19641 - 1.57019I$	$5.41584 - 1.98677I$	$0. + 3.17688I$
$u = -0.961040 - 0.526565I$ $a = -2.26543 - 0.37900I$ $b = -0.19641 + 1.57019I$	$5.41584 + 1.98677I$	$0. - 3.17688I$
$u = -0.892007 + 0.102900I$ $a = -0.782404 + 0.397432I$ $b = -0.1264520 - 0.0345198I$	$1.50518 - 0.26567I$	$6.00026 + 0.27915I$
$u = -0.892007 - 0.102900I$ $a = -0.782404 - 0.397432I$ $b = -0.1264520 + 0.0345198I$	$1.50518 + 0.26567I$	$6.00026 - 0.27915I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.103930 + 0.029028I$ $a = 0.03014 + 2.74289I$ $b = 0.00205 - 1.91806I$	$8.92371 + 3.58327I$	$4.99152 - 2.55707I$
$u = 1.103930 - 0.029028I$ $a = 0.03014 - 2.74289I$ $b = 0.00205 + 1.91806I$	$8.92371 - 3.58327I$	$4.99152 + 2.55707I$
$u = -0.784529 + 0.412156I$ $a = 1.58952 - 1.83215I$ $b = 1.41941 + 0.12823I$	$-2.37641 - 1.79904I$	$-1.57784 + 3.21479I$
$u = -0.784529 - 0.412156I$ $a = 1.58952 + 1.83215I$ $b = 1.41941 - 0.12823I$	$-2.37641 + 1.79904I$	$-1.57784 - 3.21479I$
$u = -0.128537 + 0.840120I$ $a = 1.129030 + 0.709012I$ $b = 0.40430 - 2.07036I$	$8.84070 + 9.07061I$	$-0.40037 - 4.94351I$
$u = -0.128537 - 0.840120I$ $a = 1.129030 - 0.709012I$ $b = 0.40430 + 2.07036I$	$8.84070 - 9.07061I$	$-0.40037 + 4.94351I$
$u = -0.098639 + 0.843425I$ $a = -0.991418 - 0.802908I$ $b = -0.49696 + 1.82819I$	$9.77996 + 1.74437I$	$0.869817 - 0.468289I$
$u = -0.098639 - 0.843425I$ $a = -0.991418 + 0.802908I$ $b = -0.49696 - 1.82819I$	$9.77996 - 1.74437I$	$0.869817 + 0.468289I$
$u = -0.562511 + 0.604780I$ $a = -0.207632 - 1.106740I$ $b = 0.22739 - 1.74075I$	$3.75359 + 4.13544I$	$-3.29521 - 2.12817I$
$u = -0.562511 - 0.604780I$ $a = -0.207632 + 1.106740I$ $b = 0.22739 + 1.74075I$	$3.75359 - 4.13544I$	$-3.29521 + 2.12817I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.071264 + 0.783310I$ $a = -0.318627 - 0.574074I$ $b = -0.332760 + 0.593277I$	$2.40985 - 2.75947I$	$0.20281 + 3.78069I$
$u = 0.071264 - 0.783310I$ $a = -0.318627 + 0.574074I$ $b = -0.332760 - 0.593277I$	$2.40985 + 2.75947I$	$0.20281 - 3.78069I$
$u = -1.159840 + 0.371143I$ $a = -0.819557 + 0.084078I$ $b = 0.146793 - 0.318351I$	$3.81880 - 0.72340I$	0
$u = -1.159840 - 0.371143I$ $a = -0.819557 - 0.084078I$ $b = 0.146793 + 0.318351I$	$3.81880 + 0.72340I$	0
$u = -0.481732 + 0.609553I$ $a = -0.101202 + 0.987549I$ $b = -0.01229 + 1.62632I$	$4.06039 - 2.47774I$	$-2.81595 + 2.59394I$
$u = -0.481732 - 0.609553I$ $a = -0.101202 - 0.987549I$ $b = -0.01229 - 1.62632I$	$4.06039 + 2.47774I$	$-2.81595 - 2.59394I$
$u = 0.173693 + 0.738661I$ $a = -0.367593 + 0.052677I$ $b = 0.234475 + 0.228624I$	$-0.01361 - 2.88077I$	$0.72874 + 4.09182I$
$u = 0.173693 - 0.738661I$ $a = -0.367593 - 0.052677I$ $b = 0.234475 - 0.228624I$	$-0.01361 + 2.88077I$	$0.72874 - 4.09182I$
$u = 1.182480 + 0.442140I$ $a = -1.75563 - 0.72377I$ $b = 1.24222 + 0.73561I$	$3.09283 + 3.04460I$	0
$u = 1.182480 - 0.442140I$ $a = -1.75563 + 0.72377I$ $b = 1.24222 - 0.73561I$	$3.09283 - 3.04460I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.654402 + 0.333690I$ $a = -1.061450 - 0.491092I$ $b = 0.509880 + 0.457534I$	$-1.277320 + 0.104972I$	$-6.49712 - 0.81478I$
$u = 0.654402 - 0.333690I$ $a = -1.061450 + 0.491092I$ $b = 0.509880 - 0.457534I$	$-1.277320 - 0.104972I$	$-6.49712 + 0.81478I$
$u = 1.164800 + 0.508279I$ $a = -0.311275 + 0.409745I$ $b = 0.287422 - 0.271809I$	$2.86161 + 7.55446I$	0
$u = 1.164800 - 0.508279I$ $a = -0.311275 - 0.409745I$ $b = 0.287422 + 0.271809I$	$2.86161 - 7.55446I$	0
$u = -1.183710 + 0.466863I$ $a = -0.43063 - 2.86734I$ $b = 1.42604 + 0.63435I$	$2.91319 - 5.51229I$	0
$u = -1.183710 - 0.466863I$ $a = -0.43063 + 2.86734I$ $b = 1.42604 - 0.63435I$	$2.91319 + 5.51229I$	0
$u = -0.040008 + 0.724234I$ $a = 0.167745 + 1.283370I$ $b = 1.29438 - 0.57599I$	$-0.344586 + 1.125350I$	$-2.18776 + 0.36560I$
$u = -0.040008 - 0.724234I$ $a = 0.167745 - 1.283370I$ $b = 1.29438 + 0.57599I$	$-0.344586 - 1.125350I$	$-2.18776 - 0.36560I$
$u = -1.205000 + 0.421939I$ $a = -0.336159 + 1.363990I$ $b = -0.446127 - 0.523396I$	$6.14415 - 1.44415I$	0
$u = -1.205000 - 0.421939I$ $a = -0.336159 - 1.363990I$ $b = -0.446127 + 0.523396I$	$6.14415 + 1.44415I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.199230 + 0.483275I$ $a = 0.623123 + 0.813683I$ $b = -0.381068 - 0.691428I$	$5.70689 + 7.38464I$	0
$u = 1.199230 - 0.483275I$ $a = 0.623123 - 0.813683I$ $b = -0.381068 + 0.691428I$	$5.70689 - 7.38464I$	0
$u = 1.236290 + 0.382809I$ $a = -0.78559 - 2.71496I$ $b = 0.35139 + 2.12412I$	$13.00930 - 4.90240I$	0
$u = 1.236290 - 0.382809I$ $a = -0.78559 + 2.71496I$ $b = 0.35139 - 2.12412I$	$13.00930 + 4.90240I$	0
$u = 1.238740 + 0.402230I$ $a = 0.91998 + 2.41477I$ $b = -0.47327 - 1.91914I$	$13.84570 + 2.55616I$	0
$u = 1.238740 - 0.402230I$ $a = 0.91998 - 2.41477I$ $b = -0.47327 + 1.91914I$	$13.84570 - 2.55616I$	0
$u = -1.209920 + 0.515926I$ $a = 2.42150 - 2.66691I$ $b = 0.45186 + 2.09789I$	$12.0604 - 14.0151I$	0
$u = -1.209920 - 0.515926I$ $a = 2.42150 + 2.66691I$ $b = 0.45186 - 2.09789I$	$12.0604 + 14.0151I$	0
$u = -1.217650 + 0.504060I$ $a = -1.94270 + 2.65801I$ $b = -0.57244 - 1.82873I$	$13.1170 - 6.6351I$	0
$u = -1.217650 - 0.504060I$ $a = -1.94270 - 2.65801I$ $b = -0.57244 + 1.82873I$	$13.1170 + 6.6351I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.357516$ $a = -1.87639$ $b = \quad 0.613111$	-1.12692	-9.48630

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle b+1,\ u^7-2u^5+u^4+2u^3-u^2+a+u,\ u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^3\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u^3\\u^5-u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^6-u^4+1\\-u^8+2u^6-2u^4\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^7+2u^5-u^4-2u^3+u^2-u\\-1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u^6-u^4+1\\-u^8+2u^6-2u^4\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^7+2u^5-u^4-2u^3+u^2-u\\-1\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^3\\u^3-u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-u^7+2u^5-u^4-u^3+u^2-u\\-u^3+u-1\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= u^8-6u^7-u^6+12u^5-5u^4-10u^3+7u^2-7u-6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^9$
c_3, c_8	u^9
c_4	$(u+1)^9$
c_5, c_9	$u^9 - u^8 + 2u^7 - u^6 + 3u^5 - u^4 + 2u^3 + u + 1$
c_6	$u^9 - u^8 - 2u^7 + 3u^6 + u^5 - 3u^4 + 2u^3 - u + 1$
c_7	$u^9 - 3u^8 + 8u^7 - 13u^6 + 17u^5 - 17u^4 + 12u^3 - 6u^2 + u + 1$
c_{10}	$u^9 + 5u^8 + 12u^7 + 15u^6 + 9u^5 - u^4 - 4u^3 - 2u^2 + u + 1$
c_{11}	$u^9 + u^8 - 2u^7 - 3u^6 + u^5 + 3u^4 + 2u^3 - u - 1$
c_{12}	$u^9 + 3u^8 + 8u^7 + 13u^6 + 17u^5 + 17u^4 + 12u^3 + 6u^2 + u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^9$
c_3, c_8	y^9
c_5, c_9	$y^9+3y^8+8y^7+13y^6+17y^5+17y^4+12y^3+6y^2+y-1$
c_6, c_{11}	$y^9-5y^8+12y^7-15y^6+9y^5+y^4-4y^3+2y^2+y-1$
c_7, c_{12}	$y^9+7y^8+20y^7+25y^6+5y^5-15y^4+22y^2+13y-1$
c_{10}	$y^9-y^8+12y^7-7y^6+37y^5+y^4-10y^2+5y-1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=\ \ 0.772920+0.510351I$ $a=-0.628748-1.040710I$ $b=-1.00000$	$-3.42837+2.09337I$	$-10.43453-4.18932I$
$u=\ \ 0.772920-0.510351I$ $a=-0.628748+1.040710I$ $b=-1.00000$	$-3.42837-2.09337I$	$-10.43453+4.18932I$
$u=-0.825933$ $a=\ \ 1.66309$ $b=-1.00000$	-0.446489	4.72420
$u=-1.173910+0.391555I$ $a=\ \ 1.321020+0.175437I$ $b=-1.00000$	$2.72642-1.33617I$	$-0.549708+1.017936I$
$u=-1.173910-0.391555I$ $a=\ \ 1.321020-0.175437I$ $b=-1.00000$	$2.72642+1.33617I$	$-0.549708-1.017936I$
$u=\ \ 0.141484+0.739668I$ $a=\ \ 0.081981+0.728244I$ $b=-1.00000$	$-1.02799-2.45442I$	$-6.31821+2.62939I$
$u=\ \ 0.141484-0.739668I$ $a=\ \ 0.081981-0.728244I$ $b=-1.00000$	$-1.02799+2.45442I$	$-6.31821-2.62939I$
$u=\ \ 1.172470+0.500383I$ $a=\ \ 0.89420-1.47834I$ $b=-1.00000$	$1.95319+7.08493I$	$-3.05967-5.11095I$
$u=\ \ 1.172470-0.500383I$ $a=\ \ 0.89420+1.47834I$ $b=-1.00000$	$1.95319-7.08493I$	$-3.05967+5.11095I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^{51}+12u^{50}+\cdots+8u+1)$
c_2	$((u-1)^9)(u^{51}-10u^{50}+\cdots-8u+1)$
c_3, c_8	$u^9(u^{51}+u^{50}+\cdots+512u+512)$
c_4	$((u+1)^9)(u^{51}-10u^{50}+\cdots-8u+1)$
c_5	$(u^9-u^8+\cdots+u+1)(u^{51}-2u^{50}+\cdots+2u+1)$
c_6	$(u^9-u^8+\cdots-u+1)(u^{51}-2u^{50}+\cdots-6u^2+1)$
c_7	$(u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1)$ $\cdot(u^{51}-6u^{50}+\cdots-64u+5)$
c_9	$(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)$ $\cdot(u^{51}+8u^{50}+\cdots+20174u-565)$
c_{10}	$(u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1)$ $\cdot(u^{51}-28u^{50}+\cdots+12u-1)$
c_{11}	$(u^9+u^8+\cdots-u-1)(u^{51}-2u^{50}+\cdots-6u^2+1)$
c_{12}	$(u^9+3u^8+8u^7+13u^6+17u^5+17u^4+12u^3+6u^2+u-1)$ $\cdot(u^{51}-6u^{50}+\cdots-64u+5)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^{51}+64y^{50}+\cdots+108y-1)$
c_2, c_4	$((y-1)^9)(y^{51}-12y^{50}+\cdots+8y-1)$
c_3, c_8	$y^9(y^{51}+57y^{50}+\cdots-4194304y-262144)$
c_5	$(y^9+3y^8+8y^7+13y^6+17y^5+17y^4+12y^3+6y^2+y-1)$ $\cdot(y^{51}-60y^{50}+\cdots+12y-1)$
c_6, c_{11}	$(y^9-5y^8+12y^7-15y^6+9y^5+y^4-4y^3+2y^2+y-1)$ $\cdot(y^{51}-28y^{50}+\cdots+12y-1)$
c_7, c_{12}	$(y^9+7y^8+20y^7+25y^6+5y^5-15y^4+22y^2+13y-1)$ $\cdot(y^{51}+44y^{50}+\cdots+1176y-25)$
c_9	$(y^9+3y^8+8y^7+13y^6+17y^5+17y^4+12y^3+6y^2+y-1)$ $\cdot(y^{51}-24y^{50}+\cdots+384067096y-319225)$
c_{10}	$(y^9-y^8+12y^7-7y^6+37y^5+y^4-10y^2+5y-1)$ $\cdot(y^{51}-8y^{50}+\cdots+72y-1)$