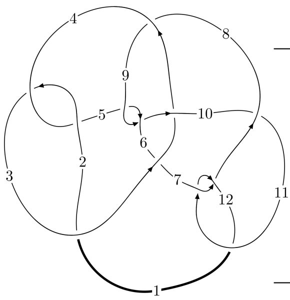
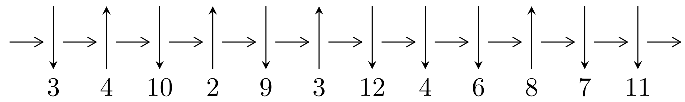
$12n_{0143}$ ($K12n_{0143}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -5018882u^{19} - 3159071u^{18} + \cdots + 355428844b - 8946208,$$
$$4030002u^{19} + 3341564u^{18} + \cdots + 35542844a + 3081004,\ u^{20} - u^{19} + \cdots + 4u - 4\rangle$$
$$I_2^u = \langle -3u^3a + 4u^2a - 8u^3 + 5au + 2u^2 + 13b + 2a + 9u + 1,\ 3u^3a - 2u^2a + 2a^2 - u^2 + 4a + 6u - 2,$$
$$u^4 - 2u^2 + 2\rangle$$

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

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 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.

$\boldsymbol{I_1^u = \langle -5.02\times 10^6 u^{19} - 3.16\times 10^6 u^{18} + \cdots + 3.55\times 10^7 b - 8.95\times 10^6,\ 4.03\times 10^6 u^{19} + 3.34\times 10^6 u^{18} + \cdots + 3.55\times 10^7 a + 3.08\times 10^6,\ u^{20} - u^{19} + \cdots + 4u - 4\rangle}$

(i) Arc colorings

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

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.113384u^{19} - 0.0940151u^{18} + \cdots + 0.649600u - 0.0866842 \\ 0.141207u^{19} + 0.0888806u^{18} + \cdots + 0.434285u + 0.251702 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 0.334897u^{19} - 0.0768593u^{18} + \cdots + 0.470869u + 2.67956 \\ -0.0397535u^{19} + 0.166369u^{18} + \cdots - 0.371958u - 0.816791 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -0.254108u^{19} - 0.153593u^{18} + \cdots + 0.947053u - 0.825468 \\ 0.171597u^{19} + 0.0740954u^{18} + \cdots + 0.128017u + 0.521714 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.199337u^{19} + 0.0822480u^{18} + \cdots + 0.449295u - 0.850726 \\ 0.0288459u^{19} + 0.0324049u^{18} + \cdots + 1.28582u + 0.0973546 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.0739774u^{19} - 0.140245u^{18} + \cdots + 0.662127u - 0.407213 \\ 0.137706u^{19} - 0.0252866u^{18} + \cdots + 0.141019u + 0.447024 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.455718u^{19} + 0.276225u^{18} + \cdots + 0.309258u - 2.11593 \\ -0.200598u^{19} - 0.0655987u^{18} + \cdots + 0.985773u - 0.419904 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{16163108}{8885711}u^{19} + \frac{7616138}{8885711}u^{18} + \cdots - \frac{81238406}{8885711}u - \frac{119525194}{8885711}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{20} + 48u^{19} + \cdots - 52526u + 625$
c_2, c_4	$u^{20} + 24u^{18} + \cdots + 74u + 25$
c_3	$u^{20} + 2u^{19} + \cdots + 12u + 5$
c_5, c_9	$u^{20} + 3u^{19} + \cdots + u - 1$
c_6	$u^{20} + 4u^{19} + \cdots - 51528u - 13061$
c_7, c_{11}	$u^{20} + u^{19} + \cdots - 4u - 4$
c_8	$u^{20} - 16u^{19} + \cdots - 18622u - 15107$
c_{10}	$u^{20} + 3u^{19} + \cdots + 116u + 76$
c_{12}	$u^{20} + 15u^{19} + \cdots + 80u + 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{20} - 400y^{19} + \cdots - 3308161926y + 390625$
c_2, c_4	$y^{20} + 48y^{19} + \cdots - 52526y + 625$
c_3	$y^{20} + 24y^{18} + \cdots - 74y + 25$
c_5, c_9	$y^{20} - 45y^{19} + \cdots + 77y + 1$
c_6	$y^{20} + 60y^{19} + \cdots - 809328142y + 170589721$
c_7, c_{11}	$y^{20} - 15y^{19} + \cdots - 80y + 16$
c_8	$y^{20} - 120y^{19} + \cdots - 367173334y + 228221449$
c_{10}	$y^{20} + 45y^{19} + \cdots - 68176y + 5776$
c_{12}	$y^{20} - 15y^{19} + \cdots + 768y + 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.027210 + 0.343771I$ $a = 0.25199 - 2.64585I$ $b = -0.766725 + 1.006540I$	$-2.86803 - 3.80264I$	$-6.48723 + 4.67286I$
$u = 1.027210 - 0.343771I$ $a = 0.25199 + 2.64585I$ $b = -0.766725 - 1.006540I$	$-2.86803 + 3.80264I$	$-6.48723 - 4.67286I$
$u = -1.095930 + 0.435073I$ $a = 1.163710 - 0.763492I$ $b = 0.458140 + 0.989102I$	$-2.45038 + 5.65982I$	$-4.21302 - 7.24292I$
$u = -1.095930 - 0.435073I$ $a = 1.163710 + 0.763492I$ $b = 0.458140 - 0.989102I$	$-2.45038 - 5.65982I$	$-4.21302 + 7.24292I$
$u = -0.722942 + 0.357669I$ $a = -0.128326 - 1.009150I$ $b = -0.238239 - 0.123051I$	$0.99363 + 1.64776I$	$1.20276 - 5.62384I$
$u = -0.722942 - 0.357669I$ $a = -0.128326 + 1.009150I$ $b = -0.238239 + 0.123051I$	$0.99363 - 1.64776I$	$1.20276 + 5.62384I$
$u = 0.106031 + 1.190120I$ $a = -0.299156 + 0.869186I$ $b = 0.09465 - 2.29475I$	$19.2969 + 4.5215I$	$-5.96688 - 1.69232I$
$u = 0.106031 - 1.190120I$ $a = -0.299156 - 0.869186I$ $b = 0.09465 + 2.29475I$	$19.2969 - 4.5215I$	$-5.96688 + 1.69232I$
$u = 0.634751 + 0.432509I$ $a = 0.196432 - 0.368569I$ $b = 0.643286 + 0.493353I$	$-1.74557 + 0.63892I$	$-5.74453 + 1.51352I$
$u = 0.634751 - 0.432509I$ $a = 0.196432 + 0.368569I$ $b = 0.643286 - 0.493353I$	$-1.74557 - 0.63892I$	$-5.74453 - 1.51352I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.739383$ $a = -0.350220$ $b = 0.508808$	-0.989681	-10.9360
$u = 1.350830 + 0.261047I$ $a = -1.05824 - 1.16450I$ $b = 0.045773 + 1.216250I$	$-4.75007 - 0.87462I$	$-9.06700 + 0.37407I$
$u = 1.350830 - 0.261047I$ $a = -1.05824 + 1.16450I$ $b = 0.045773 - 1.216250I$	$-4.75007 + 0.87462I$	$-9.06700 - 0.37407I$
$u = -0.255829 + 0.544433I$ $a = -0.156916 + 1.044260I$ $b = -0.341861 + 0.731952I$	$-0.11659 - 1.77179I$	$-0.89537 + 3.37821I$
$u = -0.255829 - 0.544433I$ $a = -0.156916 - 1.044260I$ $b = -0.341861 - 0.731952I$	$-0.11659 + 1.77179I$	$-0.89537 - 3.37821I$
$u = 1.35494 + 0.64126I$ $a = 1.91114 + 2.01731I$ $b = -0.21695 - 2.30777I$	$15.4383 - 10.9552I$	$-7.83113 + 4.63988I$
$u = 1.35494 - 0.64126I$ $a = 1.91114 - 2.01731I$ $b = -0.21695 + 2.30777I$	$15.4383 + 10.9552I$	$-7.83113 - 4.63988I$
$u = -1.52619$ $a = -1.06989$ $b = 0.168676$	-9.28250	-9.91420
$u = -1.50565 + 0.55625I$ $a = -0.67058 + 2.22111I$ $b = -0.01682 - 2.17499I$	$14.2365 + 1.7524I$	$-8.57238 - 0.70411I$
$u = -1.50565 - 0.55625I$ $a = -0.67058 - 2.22111I$ $b = -0.01682 + 2.17499I$	$14.2365 - 1.7524I$	$-8.57238 + 0.70411I$

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

(i) Arc colorings

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} a \\ 0.230769au^3 + 0.615385u^3 + \cdots - 0.153846a - 0.0769231 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1.61538au^3 - 1.80769u^3 + \cdots - 0.923077a + 1.53846 \\ 0.769231au^3 + 1.38462u^3 + \cdots + 0.153846a + 1.07692 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3 \\ u^3 - u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^3 \\ -u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.769231au^3 + 1.38462u^3 + \cdots + 1.15385a - 0.923077 \\ -0.230769au^3 - 0.615385u^3 + \cdots + 0.153846a + 0.0769231 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.384615au^3 - 2.19231u^3 + \cdots - 0.0769231a - 1.53846 \\ 0.461538au^3 + 2.23077u^3 + \cdots - 0.307692a + 0.846154 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^3 \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1.61538au^3 + 2.80769u^3 + \cdots + 0.923077a - 1.53846 \\ -0.769231au^3 - 2.38462u^3 + \cdots - 0.153846a - 1.07692 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{12}{13}u^3a + \frac{16}{13}u^2a + \frac{20}{13}u^3 + \frac{20}{13}au + \frac{60}{13}u^2 + \frac{8}{13}a - \frac{16}{13}u - \frac{152}{13}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_3, c_4	$(u^2 - u + 1)^4$
c_2	$(u^2 + u + 1)^4$
c_5	$(u + 1)^8$
c_6	$u^8 + 4u^7 + 8u^6 + 16u^5 + 27u^4 + 24u^3 + 24u^2 + 40u + 25$
c_7, c_{11}	$(u^4 - 2u^2 + 2)^2$
c_8	$u^8 - 4u^7 + 8u^6 - 16u^5 + 27u^4 - 24u^3 + 24u^2 - 40u + 25$
c_9	$(u - 1)^8$
c_{10}	$(u^4 + 2u^2 + 2)^2$
c_{12}	$(u^2 + 2u + 2)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_4	$(y^2+y+1)^4$
c_5, c_9	$(y-1)^8$
c_6, c_8	$y^8 - 10y^6 + 32y^5 + 75y^4 - 160y^3 + 6y^2 - 400y + 625$
c_7, c_{11}	$(y^2-2y+2)^4$
c_{10}	$(y^2+2y+2)^4$
c_{12}	$(y^2+4)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.098680 + 0.455090I$ $a = -0.789474 + 0.479379I$ $b = 0.044910 + 0.232659I$	$-4.11234 - 5.69375I$	$-10.00000 + 7.46410I$
$u = 1.098680 + 0.455090I$ $a = -1.17592 - 1.81004I$ $b = 0.04491 + 1.96471I$	$-4.11234 - 1.63398I$	$-10.00000 + 0.53590I$
$u = 1.098680 - 0.455090I$ $a = -0.789474 - 0.479379I$ $b = 0.044910 - 0.232659I$	$-4.11234 + 5.69375I$	$-10.00000 - 7.46410I$
$u = 1.098680 - 0.455090I$ $a = -1.17592 + 1.81004I$ $b = 0.04491 - 1.96471I$	$-4.11234 + 1.63398I$	$-10.00000 - 0.53590I$
$u = -1.098680 + 0.455090I$ $a = -1.55613 - 1.07799I$ $b = 0.955090 + 0.232659I$	$-4.11234 + 1.63398I$	$-10.00000 - 0.53590I$
$u = -1.098680 + 0.455090I$ $a = 1.52152 - 2.25267I$ $b = 0.95509 + 1.96471I$	$-4.11234 + 5.69375I$	$-10.00000 - 7.46410I$
$u = -1.098680 - 0.455090I$ $a = -1.55613 + 1.07799I$ $b = 0.955090 - 0.232659I$	$-4.11234 - 1.63398I$	$-10.00000 + 0.53590I$
$u = -1.098680 - 0.455090I$ $a = 1.52152 + 2.25267I$ $b = 0.95509 - 1.96471I$	$-4.11234 - 5.69375I$	$-10.00000 + 7.46410I$

III. $I^v_1 = \langle a,\ b+v,\ v^2 - v + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4v - 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 0.500000 + 0.866025I$ $a = 0$ $b = -0.500000 - 0.866025I$	$-1.64493 + 2.02988I$	$-6.00000 - 3.46410I$
$v = 0.500000 - 0.866025I$ $a = 0$ $b = -0.500000 + 0.866025I$	$-1.64493 - 2.02988I$	$-6.00000 + 3.46410I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^5)(u^{20}+48u^{19}+\cdots-52526u+625)$
c_2	$((u^2+u+1)^5)(u^{20}+24u^{18}+\cdots+74u+25)$
c_3	$((u^2-u+1)^4)(u^2+u+1)(u^{20}+2u^{19}+\cdots+12u+5)$
c_4	$((u^2-u+1)^5)(u^{20}+24u^{18}+\cdots+74u+25)$
c_5	$((u-1)^2)(u+1)^8(u^{20}+3u^{19}+\cdots+u-1)$
c_6	$(u^2+u+1)(u^8+4u^7+\cdots+40u+25)$ $\cdot(u^{20}+4u^{19}+\cdots-51528u-13061)$
c_7, c_{11}	$u^2(u^4-2u^2+2)^2(u^{20}+u^{19}+\cdots-4u-4)$
c_8	$(u^2+u+1)(u^8-4u^7+\cdots-40u+25)$ $\cdot(u^{20}-16u^{19}+\cdots-18622u-15107)$
c_9	$((u-1)^8)(u+1)^2(u^{20}+3u^{19}+\cdots+u-1)$
c_{10}	$u^2(u^4+2u^2+2)^2(u^{20}+3u^{19}+\cdots+116u+76)$
c_{12}	$u^2(u^2+2u+2)^4(u^{20}+15u^{19}+\cdots+80u+16)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^2+y+1)^5)(y^{20}-400y^{19}+\cdots-3.30816\times10^9y+390625)$
c_2, c_4	$((y^2+y+1)^5)(y^{20}+48y^{19}+\cdots-52526y+625)$
c_3	$((y^2+y+1)^5)(y^{20}+24y^{18}+\cdots-74y+25)$
c_5, c_9	$((y-1)^{10})(y^{20}-45y^{19}+\cdots+77y+1)$
c_6	$(y^2+y+1)(y^8-10y^6+\cdots-400y+625)$ $\cdot(y^{20}+60y^{19}+\cdots-809328142y+170589721)$
c_7, c_{11}	$y^2(y^2-2y+2)^4(y^{20}-15y^{19}+\cdots-80y+16)$
c_8	$(y^2+y+1)(y^8-10y^6+\cdots-400y+625)$ $\cdot(y^{20}-120y^{19}+\cdots-367173334y+228221449)$
c_{10}	$y^2(y^2+2y+2)^4(y^{20}+45y^{19}+\cdots-68176y+5776)$
c_{12}	$y^2(y^2+4)^4(y^{20}-15y^{19}+\cdots+768y+256)$