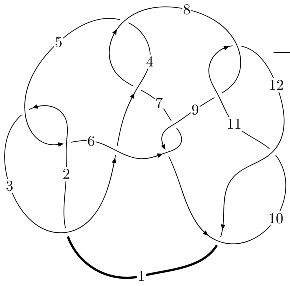
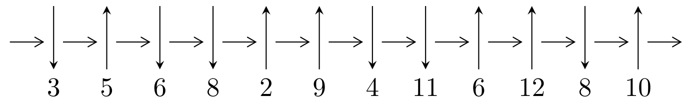
$12n_{0019}$ ($K12n_{0019}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 222u^{17} + 1807u^{16} + \cdots + 536b - 1177,\ -19u^{17} - 156u^{16} + \cdots + 8a + 89,\ u^{18} + 8u^{17} + \cdots - 8u + 1\rangle$$
$$I_2^u = \langle b,\ -u^4a - 2u^3a + u^4 - 3u^2a - u^3 + a^2 - 2au - 2u^2 - a - 5u - 3,\ u^5 + u^4 + 2u^3 + u^2 + u + 1\rangle$$
$$I_3^u = \langle -a^3u - a^3 - 3a^2 - au + 3b + 2a + u + 4,\ a^4 - a^3u + 3a^3 - a^2u + a^2 - 4a - u - 3,\ u^2 - u + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 36 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. $I^u_1 = \langle 222u^{17} + 1807u^{16} + \cdots + 536b - 1177,\ -19u^{17} - 156u^{16} + \cdots + 8a + 89,\ u^{18} + 8u^{17} + \cdots - 8u + 1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

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

$$a_{10} = \begin{pmatrix} \frac{19}{8}u^{17} + \frac{39}{2}u^{16} + \cdots + \frac{79}{2}u - \frac{89}{8} \\ -0.414179u^{17} - 3.37127u^{16} + \cdots - 6.08769u + 2.19590 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 2.78918u^{17} + 22.8713u^{16} + \cdots + 45.5877u - 13.3209 \\ -0.414179u^{17} - 3.37127u^{16} + \cdots - 6.08769u + 2.19590 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1.65112u^{17} - 13.6642u^{16} + \cdots - 27.3918u + 7.50560 \\ 0.430970u^{17} + 3.58396u^{16} + \cdots + 6.21455u - 1.77985 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -1.69590u^{17} - 13.9813u^{16} + \cdots - 27.3134u + 7.47948 \\ 0.345149u^{17} + 2.83022u^{16} + \cdots + 4.67724u - 1.35075 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.447761u^{17} + 3.79664u^{16} + \cdots + 7.84142u - 0.613806 \\ -0.345149u^{17} - 2.83022u^{16} + \cdots - 4.67724u + 1.35075 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1.43657u^{17} + 11.9049u^{16} + \cdots + 24.4235u - 6.30784 \\ -0.468284u^{17} - 3.88993u^{16} + \cdots - 6.77425u + 2.21642 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{1867}{536}u^{17} + \frac{15631}{536}u^{16} + \cdots + \frac{28407}{536}u - \frac{3763}{268}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{18} + 2u^{17} + \cdots - 34u + 1$
c_2, c_5	$u^{18} + 8u^{17} + \cdots - 8u + 1$
c_3	$u^{18} - 8u^{17} + \cdots - 16496u + 1921$
c_4, c_7	$u^{18} + 2u^{17} + \cdots - 384u + 256$
c_6, c_9	$u^{18} + 2u^{17} + \cdots + 1024u^2 + 1024$
c_8, c_{11}	$u^{18} - 9u^{17} + \cdots + 5u + 1$
c_{10}, c_{12}	$u^{18} + u^{17} + \cdots + 7u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{18} + 34y^{17} + \cdots - 706y + 1$
c_2, c_5	$y^{18} + 2y^{17} + \cdots - 34y + 1$
c_3	$y^{18} + 42y^{17} + \cdots - 77040466y + 3690241$
c_4, c_7	$y^{18} + 30y^{17} + \cdots + 409600y + 65536$
c_6, c_9	$y^{18} + 50y^{17} + \cdots + 2097152y + 1048576$
c_8, c_{11}	$y^{18} - y^{17} + \cdots - 7y + 1$
c_{10}, c_{12}	$y^{18} + 47y^{17} + \cdots - 199y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.489678 + 0.809386I$ $a = -3.46446 + 1.37116I$ $b = -0.367948 - 0.217959I$	$-0.02354 + 3.71255I$	$2.6622 - 33.9545I$
$u = 0.489678 - 0.809386I$ $a = -3.46446 - 1.37116I$ $b = -0.367948 + 0.217959I$	$-0.02354 - 3.71255I$	$2.6622 + 33.9545I$
$u = -0.528473 + 1.113200I$ $a = 0.884253 - 0.149684I$ $b = -0.293472 - 1.150100I$	$-6.98798 - 6.29888I$	$-7.63956 + 6.18005I$
$u = -0.528473 - 1.113200I$ $a = 0.884253 + 0.149684I$ $b = -0.293472 + 1.150100I$	$-6.98798 + 6.29888I$	$-7.63956 - 6.18005I$
$u = 0.402685 + 0.640215I$ $a = -0.600704 - 0.110262I$ $b = 0.079711 + 0.564353I$	$-0.176698 + 1.378410I$	$-2.62845 - 4.45652I$
$u = 0.402685 - 0.640215I$ $a = -0.600704 + 0.110262I$ $b = 0.079711 - 0.564353I$	$-0.176698 - 1.378410I$	$-2.62845 + 4.45652I$
$u = 0.166779 + 0.714203I$ $a = -0.576482 + 0.150196I$ $b = 0.406152 + 0.438776I$	$-0.194005 + 1.320020I$	$-1.40154 - 3.97468I$
$u = 0.166779 - 0.714203I$ $a = -0.576482 - 0.150196I$ $b = 0.406152 - 0.438776I$	$-0.194005 - 1.320020I$	$-1.40154 + 3.97468I$
$u = -0.79804 + 1.31718I$ $a = -1.30880 - 1.44991I$ $b = -1.88686 + 2.04182I$	$14.5520 - 13.1732I$	$-2.14093 + 5.47150I$
$u = -0.79804 - 1.31718I$ $a = -1.30880 + 1.44991I$ $b = -1.88686 - 2.04182I$	$14.5520 + 13.1732I$	$-2.14093 - 5.47150I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.48576 + 0.43889I$ $a = -0.636632 - 0.933823I$ $b = -2.70328 - 3.24263I$	$17.4544 + 5.4859I$	$-0.93598 - 1.55559I$
$u = -1.48576 - 0.43889I$ $a = -0.636632 + 0.933823I$ $b = -2.70328 + 3.24263I$	$17.4544 - 5.4859I$	$-0.93598 + 1.55559I$
$u = -1.39001 + 1.00947I$ $a = -1.31713 + 0.69280I$ $b = -0.33733 + 5.04758I$	$-5.22275 + 0.41218I$	$-1.70669 + 0.I$
$u = -1.39001 - 1.00947I$ $a = -1.31713 - 0.69280I$ $b = -0.33733 - 5.04758I$	$-5.22275 - 0.41218I$	$-1.70669 + 0.I$
$u = -1.06945 + 1.38280I$ $a = 1.27493 + 1.39729I$ $b = 3.58701 - 2.69224I$	$11.82800 - 4.92111I$	$-2.64479 + 1.56009I$
$u = -1.06945 - 1.38280I$ $a = 1.27493 - 1.39729I$ $b = 3.58701 + 2.69224I$	$11.82800 + 4.92111I$	$-2.64479 - 1.56009I$
$u = 0.212586 + 0.037327I$ $a = -0.25498 + 2.94572I$ $b = 0.516021 - 0.465095I$	$0.024368 - 1.375910I$	$0.93572 + 4.18536I$
$u = 0.212586 - 0.037327I$ $a = -0.25498 - 2.94572I$ $b = 0.516021 + 0.465095I$	$0.024368 + 1.375910I$	$0.93572 - 4.18536I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u^4a - 3u^3a + u^4 - 4u^2a - 5u^3 - 6u^2 - 2a - 9u - 5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.339110 + 0.822375I$ $a = 1.20942 + 2.19910I$ $b = 0$	$-0.329100 - 0.499304I$	$2.94328 - 6.15174I$
$u = 0.339110 + 0.822375I$ $a = -2.50919 - 0.05217I$ $b = 0$	$-0.32910 + 3.56046I$	$-6.96704 - 8.14994I$
$u = 0.339110 - 0.822375I$ $a = 1.20942 - 2.19910I$ $b = 0$	$-0.329100 + 0.499304I$	$2.94328 + 6.15174I$
$u = 0.339110 - 0.822375I$ $a = -2.50919 + 0.05217I$ $b = 0$	$-0.32910 - 3.56046I$	$-6.96704 + 8.14994I$
$u = -0.766826$ $a = 0.337181 + 0.584015I$ $b = 0$	$-2.40108 + 2.02988I$	$-0.15429 - 1.95361I$
$u = -0.766826$ $a = 0.337181 - 0.584015I$ $b = 0$	$-2.40108 - 2.02988I$	$-0.15429 + 1.95361I$
$u = -0.455697 + 1.200150I$ $a = 0.358089 + 0.327409I$ $b = 0$	$-5.87256 - 2.37095I$	$-5.14480 + 4.03066I$
$u = -0.455697 + 1.200150I$ $a = 0.104500 - 0.473819I$ $b = 0$	$-5.87256 - 6.43072I$	$-0.67715 + 5.27500I$
$u = -0.455697 - 1.200150I$ $a = 0.358089 - 0.327409I$ $b = 0$	$-5.87256 + 2.37095I$	$-5.14480 - 4.03066I$
$u = -0.455697 - 1.200150I$ $a = 0.104500 + 0.473819I$ $b = 0$	$-5.87256 + 6.43072I$	$-0.67715 - 5.27500I$

III. $\boldsymbol{I^u_3 = \langle -a^3u - a^3 - 3a^2 - au + 3b + 2a + u + 4,\ a^4 - a^3u + 3a^3 - a^2u + a^2 - 4a - u - 3,\ u^2 - u + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{7}{3}a^3u + \frac{11}{3}a^3 - 5a^2u + 4a^2 + \frac{11}{3}au - \frac{25}{3}a + \frac{25}{3}u - \frac{44}{3}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_5	$(y^2 + y + 1)^4$
c_4, c_7	y^8
c_6, c_9, c_{10} c_{12}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^2$
c_8, c_{11}	$(y^4 + y^3 + 3y^2 + 2y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.500000 + 0.866025I$ $a = -0.715307 - 0.631577I$ $b = -0.395123 + 0.506844I$	$0.211005 + 0.614778I$	$0.01166 + 7.13374I$
$u = 0.500000 + 0.866025I$ $a = 1.248740 + 0.225872I$ $b = -0.10488 + 1.55249I$	$-6.79074 - 1.13408I$	$-8.12668 + 3.09304I$
$u = 0.500000 + 0.866025I$ $a = -1.44025 - 0.04422I$ $b = -0.10488 - 1.55249I$	$-6.79074 + 5.19385I$	$-5.34148 - 0.51945I$
$u = 0.500000 + 0.866025I$ $a = -1.59319 + 1.31595I$ $b = -0.395123 - 0.506844I$	$0.21101 + 3.44499I$	$4.95650 - 5.37720I$
$u = 0.500000 - 0.866025I$ $a = -0.715307 + 0.631577I$ $b = -0.395123 - 0.506844I$	$0.211005 - 0.614778I$	$0.01166 - 7.13374I$
$u = 0.500000 - 0.866025I$ $a = 1.248740 - 0.225872I$ $b = -0.10488 - 1.55249I$	$-6.79074 + 1.13408I$	$-8.12668 - 3.09304I$
$u = 0.500000 - 0.866025I$ $a = -1.44025 + 0.04422I$ $b = -0.10488 + 1.55249I$	$-6.79074 - 5.19385I$	$-5.34148 + 0.51945I$
$u = 0.500000 - 0.866025I$ $a = -1.59319 - 1.31595I$ $b = -0.395123 + 0.506844I$	$0.21101 - 3.44499I$	$4.95650 + 5.37720I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)^4(u^5-3u^4+4u^3-u^2-u+1)^2$ $\cdot(u^{18}+2u^{17}+\cdots-34u+1)$
c_2	$((u^2+u+1)^4)(u^5-u^4+\cdots+u-1)^2(u^{18}+8u^{17}+\cdots-8u+1)$
c_3	$(u^2-u+1)^4(u^5+u^4-2u^3-u^2+u-1)^2$ $\cdot(u^{18}-8u^{17}+\cdots-16496u+1921)$
c_4	$u^8(u^5+u^4+\cdots+u-1)^2(u^{18}+2u^{17}+\cdots-384u+256)$
c_5	$((u^2-u+1)^4)(u^5+u^4+\cdots+u+1)^2(u^{18}+8u^{17}+\cdots-8u+1)$
c_6	$u^{10}(u^4+u^3+3u^2+2u+1)^2(u^{18}+2u^{17}+\cdots+1024u^2+1024)$
c_7	$u^8(u^5-u^4+\cdots+u+1)^2(u^{18}+2u^{17}+\cdots-384u+256)$
c_8	$((u^2-u+1)^5)(u^4+u^3+u^2+1)^2(u^{18}-9u^{17}+\cdots+5u+1)$
c_9	$u^{10}(u^4-u^3+3u^2-2u+1)^2(u^{18}+2u^{17}+\cdots+1024u^2+1024)$
c_{10}	$((u^2+u+1)^5)(u^4+u^3+3u^2+2u+1)^2(u^{18}+u^{17}+\cdots+7u+1)$
c_{11}	$((u^2+u+1)^5)(u^4-u^3+u^2+1)^2(u^{18}-9u^{17}+\cdots+5u+1)$
c_{12}	$((u^2-u+1)^5)(u^4-u^3+3u^2-2u+1)^2(u^{18}+u^{17}+\cdots+7u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^2+y+1)^4(y^5-y^4+8y^3-3y^2+3y-1)^2$ $\cdot(y^{18}+34y^{17}+\cdots-706y+1)$
c_2, c_5	$(y^2+y+1)^4(y^5+3y^4+4y^3+y^2-y-1)^2$ $\cdot(y^{18}+2y^{17}+\cdots-34y+1)$
c_3	$(y^2+y+1)^4(y^5-5y^4+8y^3-3y^2-y-1)^2$ $\cdot(y^{18}+42y^{17}+\cdots-77040466y+3690241)$
c_4, c_7	$y^8(y^5-5y^4+8y^3-3y^2-y-1)^2$ $\cdot(y^{18}+30y^{17}+\cdots+409600y+65536)$
c_6, c_9	$y^{10}(y^4+5y^3+7y^2+2y+1)^2$ $\cdot(y^{18}+50y^{17}+\cdots+2097152y+1048576)$
c_8, c_{11}	$((y^2+y+1)^5)(y^4+y^3+3y^2+2y+1)^2(y^{18}-y^{17}+\cdots-7y+1)$
c_{10}, c_{12}	$(y^2+y+1)^5(y^4+5y^3+7y^2+2y+1)^2$ $\cdot(y^{18}+47y^{17}+\cdots-199y+1)$