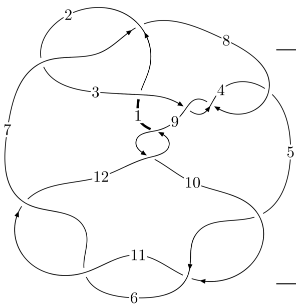
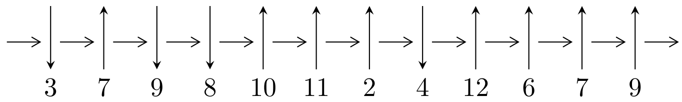
$12n_{0565}$ ($K12n_{0565}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 5u^{23} - 65u^{21} + \cdots + 4b + 8,\ -u^{23} + 14u^{21} + \cdots + 4a - 4,\ u^{24} + 2u^{23} + \cdots - u + 2\rangle$$
$$I_2^u = \langle -u^6 + u^5 + 3u^4 - 3u^3 - 2u^2 + b + u,\ u^6 - 4u^4 + 4u^2 + a,\ u^8 - 5u^6 + 7u^4 - 2u^2 + 1\rangle$$
$$I_3^u = \langle a^2u + a^2 + 2au + b + 2a,\ a^3 - au + 2a + u - 2,\ u^2 - u - 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 38 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. $I^u_1 =$ $\langle 5u^{23} - 65u^{21} + \cdots + 4b + 8,\ -u^{23} + 14u^{21} + \cdots + 4a - 4,\ u^{24} + 2u^{23} + \cdots - u + 2 \rangle$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{1}{4}u^{23} - \frac{7}{2}u^{21} + \cdots + \frac{1}{4}u + 1 \\ -\frac{5}{4}u^{23} + \frac{65}{4}u^{21} + \cdots + \frac{5}{2}u - 2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{4}u^{23} - \frac{7}{2}u^{21} + \cdots + \frac{1}{4}u + 1 \\ -\frac{3}{4}u^{23} + \frac{39}{4}u^{21} + \cdots + \frac{3}{2}u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{1}{4}u^{19} - \frac{11}{4}u^{17} + \cdots + \frac{3}{4}u - 1 \\ -\frac{1}{4}u^{21} + \frac{11}{4}u^{19} + \cdots - \frac{1}{2}u^2 + \frac{1}{2}u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^8 - 5u^6 + 7u^4 - 2u^2 + 1 \\ -u^{10} + 4u^8 - 3u^6 - 2u^4 - u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} \frac{1}{2}u^{13} - 4u^{11} + \cdots - \frac{3}{2}u + \frac{1}{2} \\ -\frac{1}{4}u^{20} + \frac{11}{4}u^{18} + \cdots - \frac{5}{4}u^2 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^4 - 3u^2 + 1 \\ -u^6 + 2u^4 + u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= 2u^{23} - 28u^{21} + 164u^{19} + 2u^{18} - 520u^{17} - 22u^{16} + 968u^{15} + 96u^{14} - 1076u^{13} - 210u^{12} + 672u^{11} + 242u^{10} - 116u^9 - 148u^8 - 170u^7 + 50u^6 + 116u^5 - 2u^4 - 38u^3 - 2u^2 + 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{24} + u^{23} + \cdots - 61u + 4$
c_2, c_7	$u^{24} + u^{23} + \cdots + 3u + 2$
c_3, c_4, c_8	$u^{24} + u^{23} + \cdots + 9u + 2$
c_5, c_6, c_{10} c_{11}	$u^{24} - 2u^{23} + \cdots + u + 2$
c_9, c_{12}	$u^{24} + 8u^{23} + \cdots + 5111u + 1016$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{24} + 53y^{23} + \cdots - 1345y + 16$
c_2, c_7	$y^{24} + y^{23} + \cdots - 61y + 4$
c_3, c_4, c_8	$y^{24} + 37y^{23} + \cdots - 77y + 4$
c_5, c_6, c_{10} c_{11}	$y^{24} - 28y^{23} + \cdots + 19y + 4$
c_9, c_{12}	$y^{24} - 16y^{23} + \cdots - 9677345y + 1032256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.831943 + 0.541956I$ $a = 1.49407 - 0.41444I$ $b = -2.17525 + 1.60820I$	$11.55510 - 8.08338I$	$8.69208 + 5.77253I$
$u = -0.831943 - 0.541956I$ $a = 1.49407 + 0.41444I$ $b = -2.17525 - 1.60820I$	$11.55510 + 8.08338I$	$8.69208 - 5.77253I$
$u = 0.922316 + 0.467245I$ $a = -0.58520 + 1.32150I$ $b = 2.12119 - 1.04366I$	$12.25690 + 0.16906I$	$9.76193 - 1.32433I$
$u = 0.922316 - 0.467245I$ $a = -0.58520 - 1.32150I$ $b = 2.12119 + 1.04366I$	$12.25690 - 0.16906I$	$9.76193 + 1.32433I$
$u = 0.792849 + 0.338620I$ $a = 1.099400 + 0.306166I$ $b = -1.77343 - 1.20094I$	$2.74098 + 4.13108I$	$9.27324 - 6.99625I$
$u = 0.792849 - 0.338620I$ $a = 1.099400 - 0.306166I$ $b = -1.77343 + 1.20094I$	$2.74098 - 4.13108I$	$9.27324 + 6.99625I$
$u = -0.061235 + 0.729145I$ $a = 1.29723 - 1.54591I$ $b = 0.134722 - 0.625129I$	$9.24115 + 3.84022I$	$5.77183 - 1.94083I$
$u = -0.061235 - 0.729145I$ $a = 1.29723 + 1.54591I$ $b = 0.134722 + 0.625129I$	$9.24115 - 3.84022I$	$5.77183 + 1.94083I$
$u = -0.576976 + 0.440713I$ $a = -0.357196 - 0.355358I$ $b = 0.897638 + 0.531756I$	$1.59762 - 1.32160I$	$9.98992 + 3.60168I$
$u = -0.576976 - 0.440713I$ $a = -0.357196 + 0.355358I$ $b = 0.897638 - 0.531756I$	$1.59762 + 1.32160I$	$9.98992 - 3.60168I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.463900 + 0.410678I$ $a = -1.09909 - 1.07076I$ $b = 0.643004 + 0.398425I$	$-1.88644 + 1.49317I$	$-2.47681 - 5.21553I$
$u = 0.463900 - 0.410678I$ $a = -1.09909 + 1.07076I$ $b = 0.643004 - 0.398425I$	$-1.88644 - 1.49317I$	$-2.47681 + 5.21553I$
$u = -1.54266 + 0.08137I$ $a = -0.146402 + 0.665748I$ $b = 1.51464 - 1.48863I$	$4.87581 - 3.07258I$	$2.46496 + 3.31099I$
$u = -1.54266 - 0.08137I$ $a = -0.146402 - 0.665748I$ $b = 1.51464 + 1.48863I$	$4.87581 + 3.07258I$	$2.46496 - 3.31099I$
$u = 1.54979 + 0.13776I$ $a = -0.331233 - 0.120821I$ $b = 1.82744 - 0.86788I$	$8.73438 + 3.47321I$	$12.37420 - 2.64740I$
$u = 1.54979 - 0.13776I$ $a = -0.331233 + 0.120821I$ $b = 1.82744 + 0.86788I$	$8.73438 - 3.47321I$	$12.37420 + 2.64740I$
$u = -0.043929 + 0.434651I$ $a = 1.31585 + 0.89975I$ $b = 0.193330 + 0.366457I$	$0.33398 - 1.43694I$	$3.82594 + 4.60037I$
$u = -0.043929 - 0.434651I$ $a = 1.31585 - 0.89975I$ $b = 0.193330 - 0.366457I$	$0.33398 + 1.43694I$	$3.82594 - 4.60037I$
$u = -1.64402 + 0.09119I$ $a = 0.613245 - 0.374905I$ $b = -4.52678 + 1.79716I$	$11.18040 - 5.75443I$	$10.48816 + 4.61050I$
$u = -1.64402 - 0.09119I$ $a = 0.613245 + 0.374905I$ $b = -4.52678 - 1.79716I$	$11.18040 + 5.75443I$	$10.48816 - 4.61050I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.65555 + 0.16059I$ $a = 0.679203 + 0.691735I$ $b = -4.69788 - 2.45987I$	$-19.4184 + 10.7998I$	$10.40821 - 4.70031I$
$u = 1.65555 - 0.16059I$ $a = 0.679203 - 0.691735I$ $b = -4.69788 + 2.45987I$	$-19.4184 - 10.7998I$	$10.40821 + 4.70031I$
$u = -1.68364 + 0.12349I$ $a = -0.729891 - 0.590434I$ $b = 4.34137 + 2.97651I$	$-18.1825 - 2.4647I$	$11.42634 + 0.60606I$
$u = -1.68364 - 0.12349I$ $a = -0.729891 + 0.590434I$ $b = 4.34137 - 2.97651I$	$-18.1825 + 2.4647I$	$11.42634 - 0.60606I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u^6 + 16u^4 - 16u^2 + 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.506844 + 0.395123I$ $a = -0.95668 - 1.22719I$ $b = -0.115465 + 0.858652I$	$-0.21101 + 1.41510I$	$4.17326 - 4.90874I$
$u = 0.506844 - 0.395123I$ $a = -0.95668 + 1.22719I$ $b = -0.115465 - 0.858652I$	$-0.21101 - 1.41510I$	$4.17326 + 4.90874I$
$u = -0.506844 + 0.395123I$ $a = -0.95668 + 1.22719I$ $b = 1.325220 - 0.155036I$	$-0.21101 - 1.41510I$	$4.17326 + 4.90874I$
$u = -0.506844 - 0.395123I$ $a = -0.95668 - 1.22719I$ $b = 1.325220 + 0.155036I$	$-0.21101 + 1.41510I$	$4.17326 - 4.90874I$
$u = 1.55249 + 0.10488I$ $a = -0.043315 - 0.641200I$ $b = 1.80642 + 0.70068I$	$6.79074 + 3.16396I$	$7.82674 - 2.56480I$
$u = 1.55249 - 0.10488I$ $a = -0.043315 + 0.641200I$ $b = 1.80642 - 0.70068I$	$6.79074 - 3.16396I$	$7.82674 + 2.56480I$
$u = -1.55249 + 0.10488I$ $a = -0.043315 + 0.641200I$ $b = -0.01617 - 2.40430I$	$6.79074 - 3.16396I$	$7.82674 + 2.56480I$
$u = -1.55249 - 0.10488I$ $a = -0.043315 - 0.641200I$ $b = -0.01617 + 2.40430I$	$6.79074 + 3.16396I$	$7.82674 - 2.56480I$

III. $\boldsymbol{I_3^u = \langle a^2u + a^2 + 2au + b + 2a,\ a^3 - au + 2a + u - 2,\ u^2 - u - 1\rangle}$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} a \\ -a^2u - a^2 - 2au - 2a \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ -u - 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} a \\ -a^2u - a^2 - au - a \end{pmatrix}$$

$$a_8 = \begin{pmatrix} a^2u \\ -2a^2u - a^2 + au \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ -2u - 2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u \\ u + 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ -u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} a \\ -a^2u - a^2 - au - a \end{pmatrix}$$

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^6 - 4y^5 + 18y^4 - 35y^3 + 43y^2 - 19y + 1$
c_2, c_3, c_4 c_7, c_8	$y^6 + 4y^5 + 6y^4 + y^3 - 5y^2 - 3y + 1$
c_5, c_6, c_9 c_{10}, c_{11}, c_{12}	$(y^2 - 3y + 1)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = \ \ 0.802554$ $b = -0.859119$	0.986960	10.0000
$u = -0.618034$ $a = -0.40128 + 1.76100I$ $b = \ \ 1.42956 - 0.80545I$	0.986960	10.0000
$u = -0.618034$ $a = -0.40128 - 1.76100I$ $b = \ \ 1.42956 + 0.80545I$	0.986960	10.0000
$u = \ \ 1.61803$ $a = -0.277125 + 0.782535I$ $b = \ \ 2.85317 - 2.96191I$	8.88264	10.0000
$u = \ \ 1.61803$ $a = -0.277125 - 0.782535I$ $b = \ \ 2.85317 + 2.96191I$	8.88264	10.0000
$u = \ \ 1.61803$ $a = \ \ 0.554250$ $b = -3.70633$	8.88264	10.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^8)(u^6+4u^5+\cdots-3u+1)(u^{24}+u^{23}+\cdots-61u+4)$
c_2, c_7	$((u^2+1)^4)(u^6+2u^4+\cdots+u-1)(u^{24}+u^{23}+\cdots+3u+2)$
c_3, c_4, c_8	$((u^2+1)^4)(u^6+2u^4+\cdots+u-1)(u^{24}+u^{23}+\cdots+9u+2)$
c_5, c_6, c_{10} c_{11}	$((u^2+u-1)^3)(u^8-5u^6+\cdots-2u^2+1)(u^{24}-2u^{23}+\cdots+u+2)$
c_9	$((u^2+u-1)^3)(u^4-u^3+u^2+1)^2(u^{24}+8u^{23}+\cdots+5111u+1016)$
c_{12}	$((u^2+u-1)^3)(u^4+u^3+u^2+1)^2(u^{24}+8u^{23}+\cdots+5111u+1016)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)^8(y^6-4y^5+18y^4-35y^3+43y^2-19y+1)$ $\cdot(y^{24}+53y^{23}+\cdots-1345y+16)$
c_2, c_7	$((y+1)^8)(y^6+4y^5+\cdots-3y+1)(y^{24}+y^{23}+\cdots-61y+4)$
c_3, c_4, c_8	$(y+1)^8(y^6+4y^5+6y^4+y^3-5y^2-3y+1)$ $\cdot(y^{24}+37y^{23}+\cdots-77y+4)$
c_5, c_6, c_{10} c_{11}	$(y^2-3y+1)^3(y^4-5y^3+7y^2-2y+1)^2$ $\cdot(y^{24}-28y^{23}+\cdots+19y+4)$
c_9, c_{12}	$(y^2-3y+1)^3(y^4+y^3+3y^2+2y+1)^2$ $\cdot(y^{24}-16y^{23}+\cdots-9677345y+1032256)$