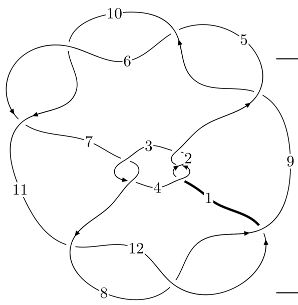
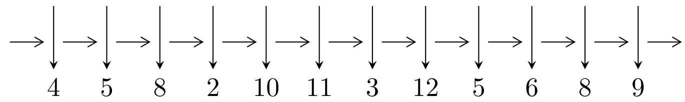
$12n_{0688}$ ($K12n_{0688}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & -1.45733 \times 10^{20} u^{26} - 2.14063 \times 10^{20} u^{25} + \cdots + 3.64969 \times 10^{20} b + 1.19460 \times 10^{21}, \\
& -4.51116 \times 10^{20} u^{26} - 7.95319 \times 10^{20} u^{25} + \cdots + 3.64969 \times 10^{20} a + 5.99946 \times 10^{21}, \\
& u^{27} + 2u^{26} + \cdots - 12u - 4 \rangle \\
I_2^u = \langle & b - u + 1,\ -u^2 + a + 3,\ u^3 - u^2 - 2u + 1 \rangle \\
I_3^u = \langle & -au + b + 1,\ 2a^2 + au + 2a - 2u - 3,\ u^2 - 2 \rangle
\end{aligned}$$

$$I_1^v = \langle a,\ b - v - 2,\ v^2 + 3v + 1 \rangle$$

* 4 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. $\boldsymbol{I_1^u = \langle -1.46\times 10^{20}u^{26} - 2.14\times 10^{20}u^{25} + \cdots + 3.65\times 10^{20}b + 1.19\times 10^{21},\ -4.51\times 10^{20}u^{26} - 7.95\times 10^{20}u^{25} + \cdots + 3.65\times 10^{20}a + 6.00\times 10^{21},\ u^{27} + 2u^{26} + \cdots - 12u - 4\rangle}$

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} 1.23604u^{26} + 2.17914u^{25} + \cdots + 8.25237u - 16.4383 \\ 0.399304u^{26} + 0.586525u^{25} + \cdots - 3.39246u - 3.27317 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0.738918u^{26} + 1.22294u^{25} + \cdots + 2.14974u - 8.57454 \\ 0.353041u^{26} + 0.631631u^{25} + \cdots - 2.16585u - 3.44416 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.175121u^{26} + 0.148966u^{25} + \cdots - 7.10327u + 0.964438 \\ 0.560998u^{26} + 0.740275u^{25} + \cdots - 2.78768u - 4.16594 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1.66235u^{26} + 2.73772u^{25} + \cdots + 6.10273u - 20.0632 \\ 0.563386u^{26} + 0.613561u^{25} + \cdots - 4.52635u - 3.30149 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.670706u^{26} + 1.16883u^{25} + \cdots + 9.64782u - 9.46907 \\ -0.635285u^{26} - 0.677229u^{25} + \cdots + 4.25702u + 3.47590 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.0973141u^{26} + 0.0651568u^{25} + \cdots + 7.52379u - 2.64979 \\ -0.591878u^{26} - 0.655073u^{25} + \cdots + 3.31129u + 3.50017 \end{pmatrix}$$

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{237495891437804361646}{91242178035245717881}u^{26} + \frac{405928781365325849828}{91242178035245717881}u^{25} + \cdots + \frac{408427437937305877365\,8}{91242178035245717881}u - \frac{538856021525291917304\,8}{91242178035245717881}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{27} - 7u^{26} + \cdots - 9u - 1$
c_3, c_7	$u^{27} - 2u^{26} + \cdots - 52u + 8$
c_5, c_6, c_9 c_{10}	$u^{27} - 2u^{26} + \cdots - 12u + 4$
c_8, c_{11}, c_{12}	$u^{27} + 4u^{26} + \cdots - 57u - 9$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{27} - 15y^{26} + \cdots + 103y - 1$
c_3, c_7	$y^{27} + 12y^{26} + \cdots + 3920y - 64$
c_5, c_6, c_9 c_{10}	$y^{27} - 24y^{26} + \cdots + 432y - 16$
c_8, c_{11}, c_{12}	$y^{27} - 10y^{26} + \cdots + 1179y - 81$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.103210 + 1.061510I$ $a = 0.243591 + 1.283730I$ $b = 0.314942 + 0.159811I$	$5.33632 - 0.36665I$	$-12.32525 - 0.05039I$
$u = -0.103210 - 1.061510I$ $a = 0.243591 - 1.283730I$ $b = 0.314942 - 0.159811I$	$5.33632 + 0.36665I$	$-12.32525 + 0.05039I$
$u = -0.903239 + 0.167691I$ $a = -1.45135 - 0.68497I$ $b = -0.485625 - 0.865359I$	$-3.12027 + 0.78467I$	$-18.4367 - 3.3729I$
$u = -0.903239 - 0.167691I$ $a = -1.45135 + 0.68497I$ $b = -0.485625 + 0.865359I$	$-3.12027 - 0.78467I$	$-18.4367 + 3.3729I$
$u = 0.337221 + 1.048840I$ $a = 0.052763 - 1.351640I$ $b = 0.215415 - 0.194118I$	$3.59374 - 7.31725I$	$-14.7365 + 5.0472I$
$u = 0.337221 - 1.048840I$ $a = 0.052763 + 1.351640I$ $b = 0.215415 + 0.194118I$	$3.59374 + 7.31725I$	$-14.7365 - 5.0472I$
$u = 1.104930 + 0.368271I$ $a = -0.268980 + 0.135914I$ $b = 0.714285 - 1.043610I$	$-3.05220 - 3.96537I$	$-17.7910 + 4.2991I$
$u = 1.104930 - 0.368271I$ $a = -0.268980 - 0.135914I$ $b = 0.714285 + 1.043610I$	$-3.05220 + 3.96537I$	$-17.7910 - 4.2991I$
$u = 1.020210 + 0.720557I$ $a = 0.780740 - 0.476181I$ $b = 1.045480 - 0.589623I$	$1.52420 + 1.21028I$	$-14.6857 - 1.0471I$
$u = 1.020210 - 0.720557I$ $a = 0.780740 + 0.476181I$ $b = 1.045480 + 0.589623I$	$1.52420 - 1.21028I$	$-14.6857 + 1.0471I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.33719$ $a=\ \ 0.790731$ $b=-0.340332$	-14.1221	-16.5250
$u=-1.374500+0.240422I$ $a=-0.496066-0.228689I$ $b=-1.169080-0.741326I$	$-6.49373+0.53770I$	$-14.7868-0.8041I$
$u=-1.374500-0.240422I$ $a=-0.496066+0.228689I$ $b=-1.169080+0.741326I$	$-6.49373-0.53770I$	$-14.7868+0.8041I$
$u=\ \ 1.40105$ $a=-11.6087$ $b=-22.6375$	-8.19904	-208.640
$u=-1.295330+0.551421I$ $a=\ \ 0.862994+0.773421I$ $b=\ \ 1.25669+1.17478I$	$1.64132+6.06050I$	$-15.3648-4.1353I$
$u=-1.295330-0.551421I$ $a=\ \ 0.862994-0.773421I$ $b=\ \ 1.25669-1.17478I$	$1.64132-6.06050I$	$-15.3648+4.1353I$
$u=\ \ 0.279491+0.475963I$ $a=\ \ 0.278696-0.748546I$ $b=-0.794845+0.094176I$	$-0.648673+0.468512I$	$-12.96489+0.08688I$
$u=\ \ 0.279491-0.475963I$ $a=\ \ 0.278696+0.748546I$ $b=-0.794845-0.094176I$	$-0.648673-0.468512I$	$-12.96489-0.08688I$
$u=-1.45969$ $a=-1.05208$ $b=-1.81866$	-6.73578	-12.1710
$u=\ \ 1.44790+0.52184I$ $a=-0.710802+0.417384I$ $b=-1.42465+1.21712I$	$0.46040-5.31882I$	$-15.6377+3.3723I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.44790 - 0.52184I$ $a = -0.710802 - 0.417384I$ $b = -1.42465 - 1.21712I$	$0.46040 + 5.31882I$	$-15.6377 - 3.3723I$
$u = -0.459185$ $a = 1.01896$ $b = 1.69587$	-10.8656	-30.2970
$u = -1.51780 + 0.43184I$ $a = -0.849204 - 0.755740I$ $b = -1.65455 - 1.79207I$	$-2.32586 + 12.67780I$	$-18.7053 - 6.5054I$
$u = -1.51780 - 0.43184I$ $a = -0.849204 + 0.755740I$ $b = -1.65455 + 1.79207I$	$-2.32586 - 12.67780I$	$-18.7053 + 6.5054I$
$u = 0.379857$ $a = 0.653894$ $b = -0.255787$	-0.575852	-17.0320
$u = -0.278308$ $a = -8.72003$ $b = -0.183695$	-2.85525	-50.3790
$u = 1.76214$ $a = 0.0324794$ $b = -0.496020$	-19.5641	-33.0880

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.24698$ $a = -1.44504$ $b = -2.24698$	-7.98968	-19.4330
$u = 0.445042$ $a = -2.80194$ $b = -0.554958$	-2.34991	-14.0220
$u = 1.80194$ $a = 0.246980$ $b = 0.801938$	-19.2692	-5.54530

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

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} a \\ au - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{1}{2}u \\ -au + 2a - u + 2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -\frac{1}{2}u \\ -au + 2a + 2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -1 \\ -2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} au - a - 1 \\ 3au - 4a - 3 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -au + 2a - \frac{1}{2}u \\ -3au + 6a - u + 2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -\frac{1}{2}u \\ -au + 2a - u + 2 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -24$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.41421$ $a = 1.05505$ $b = 0.492066$	-15.4624	-24.0000
$u = 1.41421$ $a = -2.76216$ $b = -4.90628$	-7.56670	-24.0000
$u = -1.41421$ $a = -0.473911$ $b = -0.329788$	-7.56670	-24.0000
$u = -1.41421$ $a = 0.181018$ $b = -1.25600$	-15.4624	-24.0000

IV. $I_1^v = \langle a,\ b - v - 2,\ v^2 + 3v + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = -0.381966$ $a = 0$ $b = 1.61803$	-10.5276	-6.00000
$v = -2.61803$ $a = 0$ $b = -0.618034$	-2.63189	-6.00000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^3)(u^2+u-1)^3(u^{27}-7u^{26}+\cdots-9u-1)$
c_3	$u^3(u^2-u-1)^2(u^2+u-1)(u^{27}-2u^{26}+\cdots-52u+8)$
c_4	$((u+1)^3)(u^2-u-1)^3(u^{27}-7u^{26}+\cdots-9u-1)$
c_5, c_6	$u^2(u^2-2)^2(u^3-u^2-2u+1)(u^{27}-2u^{26}+\cdots-12u+4)$
c_7	$u^3(u^2-u-1)(u^2+u-1)^2(u^{27}-2u^{26}+\cdots-52u+8)$
c_8	$((u-1)^2)(u+1)^4(u^3-u^2-2u+1)(u^{27}+4u^{26}+\cdots-57u-9)$
c_9, c_{10}	$u^2(u^2-2)^2(u^3+u^2-2u-1)(u^{27}-2u^{26}+\cdots-12u+4)$
c_{11}, c_{12}	$((u-1)^4)(u+1)^2(u^3+u^2-2u-1)(u^{27}+4u^{26}+\cdots-57u-9)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y-1)^3)(y^2-3y+1)^3(y^{27}-15y^{26}+\cdots+103y-1)$
c_3, c_7	$y^3(y^2-3y+1)^3(y^{27}+12y^{26}+\cdots+3920y-64)$
c_5, c_6, c_9 c_{10}	$y^2(y-2)^4(y^3-5y^2+6y-1)(y^{27}-24y^{26}+\cdots+432y-16)$
c_8, c_{11}, c_{12}	$((y-1)^6)(y^3-5y^2+6y-1)(y^{27}-10y^{26}+\cdots+1179y-81)$