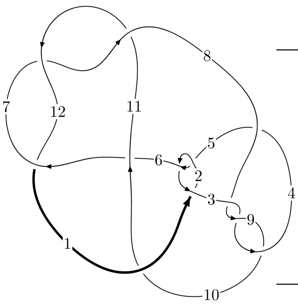
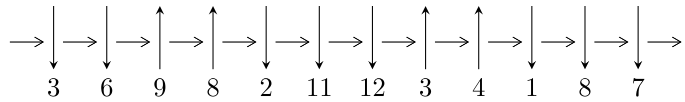
$12n_{0470}$ $(K12n_{0470})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -8.56090\times 10^{18}u^{28} + 1.26946\times 10^{19}u^{27} + \cdots + 3.30205\times 10^{19}b - 1.17890\times 10^{20},$$
$$4.24911\times 10^{17}u^{28} + 8.00391\times 10^{17}u^{27} + \cdots + 6.60410\times 10^{19}a - 1.61646\times 10^{20},\ u^{29} - u^{28} + \cdots + 8u + 8\rangle$$
$$I_2^u = \langle -8a^2u - 6a^2 - 10au + 23b + 4a - 4u + 20,\ 4a^3 + 2a^2u + 8a^2 - 2au + 12a - 5u + 6,\ u^2 - 2\rangle$$

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

* 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.

$$I^u_1 = \langle -8.56\times10^{18}u^{28}+1.27\times10^{19}u^{27}+\cdots+3.30\times10^{19}b-1.18\times10^{20},\ 4.25\times10^{17}u^{28}+8.00\times10^{17}u^{27}+\cdots+6.60\times10^{19}a-1.62\times10^{20},\ u^{29}-u^{28}+\cdots+8u+8\rangle$$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ -u^3+u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^3+2u \\ -u^3+u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.00643404u^{28}-0.0121196u^{27}+\cdots+4.90122u+2.44766 \\ 0.259260u^{28}-0.384445u^{27}+\cdots-6.62002u+3.57020 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.271117u^{28}+0.334733u^{27}+\cdots+9.14412u-1.45670 \\ -0.128384u^{28}+0.179238u^{27}+\cdots-0.404961u-0.978316 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.236109u^{28}+0.260834u^{27}+\cdots+13.1337u+0.125839 \\ -0.0574151u^{28}+0.133423u^{27}+\cdots+0.0596710u-3.33291 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.252826u^{28}-0.396565u^{27}+\cdots-1.71880u+6.01786 \\ 0.259260u^{28}-0.384445u^{27}+\cdots-6.62002u+3.57020 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0314186u^{28}-0.160388u^{27}+\cdots+8.16809u+6.71091 \\ 0.154889u^{28}-0.224315u^{27}+\cdots-3.21485u+3.05436 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.236109u^{28}+0.260834u^{27}+\cdots+13.1337u+0.125839 \\ -0.112639u^{28}+0.196907u^{27}+\cdots+1.75075u-3.53071 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2+1 \\ u^4-2u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{39228839356043585039}{33020514644217504884}u^{28} - \frac{61355544613566956791}{33020514644217504884}u^{27} + \cdots - \frac{58856639661756517532}{8255128661054376221}u + \frac{22553030914999202147 4}{8255128661054376221}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{29}+4u^{28}+\cdots+107u+49$
c_2, c_5	$u^{29}+4u^{28}+\cdots-11u+7$
c_3, c_8, c_9	$u^{29}+u^{28}+\cdots+8u-8$
c_4	$u^{29}-3u^{28}+\cdots-15272u+10856$
c_6	$u^{29}-2u^{28}+\cdots-1632u+289$
c_7, c_{11}, c_{12}	$u^{29}+2u^{28}+\cdots-4u+1$
c_{10}	$u^{29}-2u^{28}+\cdots+16u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{29} + 52y^{28} + \cdots - 12561y - 2401$
c_2, c_5	$y^{29} - 4y^{28} + \cdots + 107y - 49$
c_3, c_8, c_9	$y^{29} - 43y^{28} + \cdots + 1344y - 64$
c_4	$y^{29} - 127y^{28} + \cdots + 3814324416y - 117852736$
c_6	$y^{29} + 22y^{28} + \cdots + 1534012y - 83521$
c_7, c_{11}, c_{12}	$y^{29} + 30y^{28} + \cdots + 28y - 1$
c_{10}	$y^{29} + 46y^{28} + \cdots + 124y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.316769 + 0.789145I$ $a = 0.904647 + 0.546825I$ $b = 0.08467 - 1.45881I$	$5.67795 + 2.38900I$	$1.37819 - 3.19465I$
$u = 0.316769 - 0.789145I$ $a = 0.904647 - 0.546825I$ $b = 0.08467 + 1.45881I$	$5.67795 - 2.38900I$	$1.37819 + 3.19465I$
$u = 1.097700 + 0.412064I$ $a = -0.595170 - 0.691055I$ $b = -0.599694 + 0.489209I$	$3.55184 + 4.25255I$	$-0.45867 - 6.46134I$
$u = 1.097700 - 0.412064I$ $a = -0.595170 + 0.691055I$ $b = -0.599694 - 0.489209I$	$3.55184 - 4.25255I$	$-0.45867 + 6.46134I$
$u = -1.204910 + 0.143277I$ $a = -0.293068 - 0.232714I$ $b = -0.549997 + 0.336152I$	$3.28345 - 0.44058I$	$-60.10 - 0.545557I$
$u = -1.204910 - 0.143277I$ $a = -0.293068 + 0.232714I$ $b = -0.549997 - 0.336152I$	$3.28345 + 0.44058I$	$-60.10 + 0.545557I$
$u = -1.160470 + 0.608867I$ $a = -1.27126 + 1.44803I$ $b = -0.20515 - 1.50770I$	$10.09380 - 7.21117I$	$2.41941 + 5.24025I$
$u = -1.160470 - 0.608867I$ $a = -1.27126 - 1.44803I$ $b = -0.20515 + 1.50770I$	$10.09380 + 7.21117I$	$2.41941 - 5.24025I$
$u = -0.505279 + 0.361091I$ $a = 2.34984 - 1.72007I$ $b = -0.110424 + 1.342560I$	$1.94298 + 1.80277I$	$-0.49805 + 1.45271I$
$u = -0.505279 - 0.361091I$ $a = 2.34984 + 1.72007I$ $b = -0.110424 - 1.342560I$	$1.94298 - 1.80277I$	$-0.49805 - 1.45271I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.37914$ $a=-0.746430$ $b=-0.204561$	3.21988	2.48730
$u=\ 1.43955+0.14926I$ $a=-0.504031+1.268030I$ $b=-0.275994-1.361500I$	$8.43378-2.66043I$	$4.12391+2.05291I$
$u=\ 1.43955-0.14926I$ $a=-0.504031-1.268030I$ $b=-0.275994+1.361500I$	$8.43378+2.66043I$	$4.12391-2.05291I$
$u=-0.114786+0.495278I$ $a=\ 0.919138+0.026052I$ $b=\ 0.313764+0.344047I$	$-0.229419-1.001340I$	$-3.84178+6.77489I$
$u=-0.114786-0.495278I$ $a=\ 0.919138-0.026052I$ $b=\ 0.313764-0.344047I$	$-0.229419+1.001340I$	$-3.84178-6.77489I$
$u=\ 1.47083+0.27563I$ $a=-1.01428-1.86721I$ $b=-0.03771+1.45349I$	$8.55001+0.76591I$	$2.60710+0.I$
$u=\ 1.47083-0.27563I$ $a=-1.01428+1.86721I$ $b=-0.03771-1.45349I$	$8.55001-0.76591I$	$2.60710+0.I$
$u=-0.493739+0.068040I$ $a=\ 1.050210+0.145523I$ $b=\ 0.245555+1.259730I$	$2.00232-3.30872I$	$2.94068+6.38072I$
$u=-0.493739-0.068040I$ $a=\ 1.050210-0.145523I$ $b=\ 0.245555-1.259730I$	$2.00232+3.30872I$	$2.94068-6.38072I$
$u=\ 0.460911$ $a=\ 1.05971$ $b=\ 0.666711$	-1.88534	-1.71060

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.352362$ $a = 2.57874$ $b = -0.415198$	-2.30685	3.93900
$u = -1.78867 + 0.13031I$ $a = 0.165694 - 0.713641I$ $b = 0.825140 + 0.480483I$	$13.9627 - 6.7087I$	0
$u = -1.78867 - 0.13031I$ $a = 0.165694 + 0.713641I$ $b = 0.825140 - 0.480483I$	$13.9627 + 6.7087I$	0
$u = 1.80898 + 0.05309I$ $a = -0.009185 - 0.570290I$ $b = 0.750595 + 0.635424I$	$14.4546 + 1.4510I$	0
$u = 1.80898 - 0.05309I$ $a = -0.009185 + 0.570290I$ $b = 0.750595 - 0.635424I$	$14.4546 - 1.4510I$	0
$u = 1.79922 + 0.20085I$ $a = 0.94548 + 1.76730I$ $b = 0.30618 - 1.52419I$	$-19.0200 + 10.8571I$	0
$u = 1.79922 - 0.20085I$ $a = 0.94548 - 1.76730I$ $b = 0.30618 + 1.52419I$	$-19.0200 - 10.8571I$	0
$u = -1.88226 + 0.01785I$ $a = 0.40598 - 1.84877I$ $b = 0.22960 + 1.57941I$	$-17.6742 - 2.1522I$	0
$u = -1.88226 - 0.01785I$ $a = 0.40598 + 1.84877I$ $b = 0.22960 - 1.57941I$	$-17.6742 + 2.1522I$	0

II. $I_2^u = \langle -8a^2u - 6a^2 - 10au + 23b + 4a - 4u + 20,\ 4a^3 + 2a^2u + 8a^2 - 2au + 12a - 5u + 6,\ u^2 - 2\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ -2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ -u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} a \\ 0.347826a^2u + 0.434783au + \cdots - 0.173913a - 0.869565 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.391304a^2u + 0.739130au + \cdots + 1.30435a + 0.521739 \\ 0.0869565a^2u - 0.391304au + \cdots - 1.04348a - 0.217391 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} \frac{1}{2}u \\ -0.260870a^2u - 0.826087au + \cdots - 0.869565a - 0.347826 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.347826a^2u + 0.434783au + \cdots + 0.826087a - 0.869565 \\ 0.347826a^2u + 0.434783au + \cdots - 0.173913a - 0.869565 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} \frac{1}{2}u \\ -0.260870a^2u - 0.826087au + \cdots - 0.869565a - 0.347826 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} \frac{1}{2}u \\ -0.260870a^2u - 0.826087au + \cdots - 0.869565a - 0.347826 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{24}{23}a^2u - \frac{64}{23}a^2 - \frac{76}{23}au - \frac{80}{23}a - \frac{12}{23}u - \frac{124}{23}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.41421$ $a = -1.40536 + 0.78044I$ $b = -0.215080 - 1.307140I$	$6.31400 - 2.82812I$	$-0.49024 + 2.97945I$
$u = 1.41421$ $a = -1.40536 - 0.78044I$ $b = -0.215080 + 1.307140I$	$6.31400 + 2.82812I$	$-0.49024 - 2.97945I$
$u = 1.41421$ $a = 0.103619$ $b = -0.569840$	2.17641	-7.01950
$u = -1.41421$ $a = -0.963939$ $b = -0.569840$	2.17641	-7.01950
$u = -1.41421$ $a = -0.16448 + 1.83384I$ $b = -0.215080 - 1.307140I$	$6.31400 - 2.82812I$	$-0.49024 + 2.97945I$
$u = -1.41421$ $a = -0.16448 - 1.83384I$ $b = -0.215080 + 1.307140I$	$6.31400 + 2.82812I$	$-0.49024 - 2.97945I$

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

(i) Arc colorings

$$a_3 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ -v^2 - v + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ v + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} v^2 + v - 1 \\ v^2 - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -v^2 - v + 1 \\ -v^2 - v + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -v^2 - v + 1 \\ -v^2 + 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} v^2 + 2v - 1 \\ v^2 - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4v^2 + 2v - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^3$
c_3, c_4, c_8 c_9	u^3
c_5	$(u+1)^3$
c_6, c_{10}	u^3+u^2-1
c_7	u^3-u^2+2u-1
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_5	$(y-1)^3$
c_3, c_4, c_8 c_9	y^3
c_6, c_{10}	$y^3 - y^2 + 2y - 1$
c_7, c_{11}, c_{12}	$y^3 + 3y^2 + 2y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 0.662359 + 0.562280I$ $a = 0$ $b = 0.215080 - 1.307140I$	$1.37919 + 2.82812I$	$-5.16553 - 1.85489I$
$v = 0.662359 - 0.562280I$ $a = 0$ $b = 0.215080 + 1.307140I$	$1.37919 - 2.82812I$	$-5.16553 + 1.85489I$
$v = -1.32472$ $a = 0$ $b = 0.569840$	-2.75839	-15.6690

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^{29}+4u^{28}+\cdots+107u+49)$
c_2	$((u-1)^3)(u+1)^6(u^{29}+4u^{28}+\cdots-11u+7)$
c_3, c_8, c_9	$u^3(u^2-2)^3(u^{29}+u^{28}+\cdots+8u-8)$
c_4	$u^3(u^2-2)^3(u^{29}-3u^{28}+\cdots-15272u+10856)$
c_5	$((u-1)^6)(u+1)^3(u^{29}+4u^{28}+\cdots-11u+7)$
c_6	$((u^3-u^2+1)^2)(u^3+u^2-1)(u^{29}-2u^{28}+\cdots-1632u+289)$
c_7	$(u^3-u^2+2u-1)(u^3+u^2+2u+1)^2(u^{29}+2u^{28}+\cdots-4u+1)$
c_{10}	$((u^3+u^2-1)^3)(u^{29}-2u^{28}+\cdots+16u+1)$
c_{11}, c_{12}	$((u^3-u^2+2u-1)^2)(u^3+u^2+2u+1)(u^{29}+2u^{28}+\cdots-4u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^{29}+52y^{28}+\cdots-12561y-2401)$
c_2, c_5	$((y-1)^9)(y^{29}-4y^{28}+\cdots+107y-49)$
c_3, c_8, c_9	$y^3(y-2)^6(y^{29}-43y^{28}+\cdots+1344y-64)$
c_4	$y^3(y-2)^6(y^{29}-127y^{28}+\cdots+3.81432\times10^9y-1.17853\times10^8)$
c_6	$((y^3-y^2+2y-1)^3)(y^{29}+22y^{28}+\cdots+1534012y-83521)$
c_7, c_{11}, c_{12}	$((y^3+3y^2+2y-1)^3)(y^{29}+30y^{28}+\cdots+28y-1)$
c_{10}	$((y^3-y^2+2y-1)^3)(y^{29}+46y^{28}+\cdots+124y-1)$