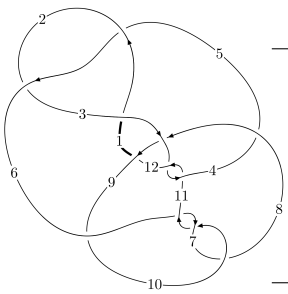
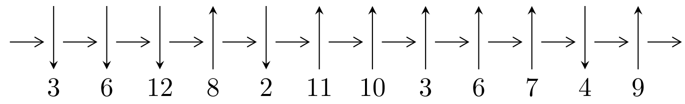
$12n_{0501}$ ($K12n_{0501}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -4u^{32} + 16u^{31} + \cdots + 4b + 5,\ 5u^{32} - 16u^{31} + \cdots + 4a + 6,\ u^{33} - 4u^{32} + \cdots - 6u + 1\rangle$$
$$I_2^u = \langle -au + b,\ 2u^2a + a^2 + au + 2u^2 + 3a + u + 4,\ u^3 + u^2 + 2u + 1\rangle$$
$$I_3^u = \langle u^2 + b + u + 1,\ -u^2 + a - 1,\ u^3 + u^2 + 2u + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 42 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. $\boldsymbol{I_1^u} =$
$\langle -4u^{32}+16u^{31}+\cdots+4b+5,\ 5u^{32}-16u^{31}+\cdots+4a+6,\ u^{33}-4u^{32}+\cdots-6u+1\rangle$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -\frac{5}{4}u^{32} + 4u^{31} + \cdots + \frac{7}{4}u - \frac{3}{2} \\ u^{32} - 4u^{31} + \cdots + 9u - \frac{5}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{32} - \frac{5}{2}u^{30} + \cdots + \frac{43}{4}u - \frac{11}{4} \\ u^{32} - 4u^{31} + \cdots + 9u - \frac{5}{4} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{11}{4}u^{32} + \frac{41}{4}u^{31} + \cdots - 23u + \frac{11}{2} \\ \frac{3}{4}u^{32} - 3u^{31} + \cdots + \frac{63}{4}u - \frac{15}{4} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -\frac{1}{4}u^{32} + \frac{3}{4}u^{31} + \cdots - 4u + \frac{1}{4} \\ \frac{1}{4}u^{32} - u^{31} + \cdots + \frac{13}{4}u - \frac{1}{2} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -\frac{1}{2}u^{32} + \frac{7}{4}u^{31} + \cdots - \frac{29}{4}u + \frac{3}{4} \\ \frac{1}{4}u^{32} - u^{31} + \cdots + \frac{17}{4}u - \frac{3}{4} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^3 - 2u \\ u^3 + u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{9}{4}u^{32} + \frac{33}{4}u^{31} + \cdots - \frac{37}{2}u + \frac{19}{4} \\ \frac{3}{4}u^{32} - \frac{11}{4}u^{31} + \cdots + 13u - \frac{13}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{9}{2}u^{32} + \frac{35}{2}u^{31} + \cdots - \frac{111}{2}u + \frac{23}{4}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{33} + 46u^{32} + \cdots + 42u + 1$
c_2, c_5	$u^{33} + 4u^{32} + \cdots + 4u - 1$
c_3, c_{11}	$u^{33} - 4u^{32} + \cdots + 10u - 1$
c_4	$u^{33} - 3u^{32} + \cdots - 31624u - 99623$
c_6, c_7, c_{10}	$u^{33} + 4u^{32} + \cdots - 6u - 1$
c_8	$u^{33} + u^{32} + \cdots + 128u^2 - 512$
c_9	$u^{33} - 4u^{32} + \cdots - 744u - 137$
c_{12}	$u^{33} + 26u^{31} + \cdots + 1410u - 2071$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{33} - 114y^{32} + \cdots + 1162y - 1$
c_2, c_5	$y^{33} - 46y^{32} + \cdots + 42y - 1$
c_3, c_{11}	$y^{33} + 26y^{32} + \cdots + 42y - 1$
c_4	$y^{33} + 39y^{32} + \cdots - 19254673246y - 9924742129$
c_6, c_7, c_{10}	$y^{33} + 34y^{32} + \cdots - 6y - 1$
c_8	$y^{33} + 49y^{32} + \cdots + 131072y - 262144$
c_9	$y^{33} + 26y^{32} + \cdots - 461086y - 18769$
c_{12}	$y^{33} + 52y^{32} + \cdots - 8631988y - 4289041$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.783955 + 0.550569I$ $a = 1.50759 - 1.19961I$ $b = -1.84235 + 0.11041I$	$-10.85950 + 2.60786I$	$-1.64483 - 2.62552I$
$u = 0.783955 - 0.550569I$ $a = 1.50759 + 1.19961I$ $b = -1.84235 - 0.11041I$	$-10.85950 - 2.60786I$	$-1.64483 + 2.62552I$
$u = 0.745301 + 0.601492I$ $a = -1.40874 + 1.23496I$ $b = 1.79275 - 0.07307I$	$-6.97586 - 2.52993I$	$1.181503 + 0.379753I$
$u = 0.745301 - 0.601492I$ $a = -1.40874 - 1.23496I$ $b = 1.79275 + 0.07307I$	$-6.97586 + 2.52993I$	$1.181503 - 0.379753I$
$u = 0.799754 + 0.494935I$ $a = -1.61442 + 1.19019I$ $b = 1.88021 - 0.15283I$	$-6.63229 + 7.68298I$	$1.86058 - 5.38110I$
$u = 0.799754 - 0.494935I$ $a = -1.61442 - 1.19019I$ $b = 1.88021 + 0.15283I$	$-6.63229 - 7.68298I$	$1.86058 + 5.38110I$
$u = -0.071136 + 1.190150I$ $a = 0.658204 - 0.211530I$ $b = -0.204931 - 0.798410I$	$1.03666 - 2.07532I$	$3.43845 + 3.26136I$
$u = -0.071136 - 1.190150I$ $a = 0.658204 + 0.211530I$ $b = -0.204931 + 0.798410I$	$1.03666 + 2.07532I$	$3.43845 - 3.26136I$
$u = -0.688247 + 0.161266I$ $a = 0.110580 + 0.396771I$ $b = 0.140092 + 0.255244I$	$3.61024 - 0.82218I$	$5.86040 + 0.81952I$
$u = -0.688247 - 0.161266I$ $a = 0.110580 - 0.396771I$ $b = 0.140092 - 0.255244I$	$3.61024 + 0.82218I$	$5.86040 - 0.81952I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.182052+1.337320I$ $a=-0.217943-0.164939I$ $b=-0.260253+0.261432I$	$-3.43336-2.41737I$	0
$u=-0.182052-1.337320I$ $a=-0.217943+0.164939I$ $b=-0.260253-0.261432I$	$-3.43336+2.41737I$	0
$u=-0.294839+1.343030I$ $a=-0.011030+0.323726I$ $b=\ \ 0.431523+0.110260I$	$-1.11961-4.40985I$	0
$u=-0.294839-1.343030I$ $a=-0.011030-0.323726I$ $b=\ \ 0.431523-0.110260I$	$-1.11961+4.40985I$	0
$u=-0.212327+0.555507I$ $a=-0.012738-0.990392I$ $b=-0.552874-0.203211I$	$1.64764-2.26500I$	$1.52805+4.62369I$
$u=-0.212327-0.555507I$ $a=-0.012738+0.990392I$ $b=-0.552874+0.203211I$	$1.64764+2.26500I$	$1.52805-4.62369I$
$u=\ \ 0.09222+1.42628I$ $a=-0.711100-0.954177I$ $b=-1.29535+1.10223I$	$-1.79243+4.81413I$	0
$u=\ \ 0.09222-1.42628I$ $a=-0.711100+0.954177I$ $b=-1.29535-1.10223I$	$-1.79243-4.81413I$	0
$u=\ \ 0.02669+1.47035I$ $a=\ \ 0.484236+0.756490I$ $b=\ \ 1.099380-0.732184I$	$-7.20920+1.09488I$	0
$u=\ \ 0.02669-1.47035I$ $a=\ \ 0.484236-0.756490I$ $b=\ \ 1.099380+0.732184I$	$-7.20920-1.09488I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.06717+1.48459I$ $a=-0.340624-0.578506I$ $b=-0.881727+0.466828I$	$-4.89325-3.34061I$	0
$u=-0.06717-1.48459I$ $a=-0.340624+0.578506I$ $b=-0.881727-0.466828I$	$-4.89325+3.34061I$	0
$u=-0.497661$ $a=-0.331095$ $b=-0.164773$	0.854180	12.3760
$u=\ \ 0.29075+1.52597I$ $a=-0.056410+1.324390I$ $b=\ \ 2.03738-0.29899I$	$-13.1973+11.6833I$	0
$u=\ \ 0.29075-1.52597I$ $a=-0.056410-1.324390I$ $b=\ \ 2.03738+0.29899I$	$-13.1973-11.6833I$	0
$u=\ \ 0.27105+1.54914I$ $a=\ \ 0.016042-1.254950I$ $b=-1.94844+0.31531I$	$-17.7298+6.4903I$	0
$u=\ \ 0.27105-1.54914I$ $a=\ \ 0.016042+1.254950I$ $b=-1.94844-0.31531I$	$-17.7298-6.4903I$	0
$u=\ \ 0.23795+1.56175I$ $a=\ \ 0.049432+1.196740I$ $b=\ \ 1.85725-0.36197I$	$-14.1120+1.0765I$	0
$u=\ \ 0.23795-1.56175I$ $a=\ \ 0.049432-1.196740I$ $b=\ \ 1.85725+0.36197I$	$-14.1120-1.0765I$	0
$u=\ \ 0.362886+0.190995I$ $a=\ \ 0.83437-3.02007I$ $b=-0.879597+0.936581I$	$3.51710+3.29019I$	$-0.48267-6.06797I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.362886 - 0.190995I$ $a = 0.83437 + 3.02007I$ $b = -0.879597 - 0.936581I$	$3.51710 - 3.29019I$	$-0.48267 + 6.06797I$
$u = 0.154044 + 0.322324I$ $a = -0.12190 + 2.14236I$ $b = 0.709313 - 0.290729I$	$-1.241050 + 0.560760I$	$-5.36805 - 2.52603I$
$u = 0.154044 - 0.322324I$ $a = -0.12190 - 2.14236I$ $b = 0.709313 + 0.290729I$	$-1.241050 - 0.560760I$	$-5.36805 + 2.52603I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 5au+5u^2+2a+5u+8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_6 c_7, c_{10}, c_{11}	$(y^3 + 3y^2 + 2y - 1)^2$
c_2, c_5, c_9	$(y^3 - y^2 + 2y - 1)^2$
c_4	$y^6 + 7y^5 + 18y^4 + 21y^3 + 16y^2 + 1$
c_8	y^6
c_{12}	$(y^3 - 2y^2 + y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.215080+1.307140I$ $a=\ \ 0.447279-0.744862I$ $b=\ \ 0.877439+0.744862I$	$-5.65624I$	$3.89456+5.95889I$
$u=-0.215080+1.307140I$ $a=\ \ 0.092519+0.562280I$ $b=-0.754878$	$-4.13758-2.82812I$	$-4.97655+4.84887I$
$u=-0.215080-1.307140I$ $a=\ \ 0.447279+0.744862I$ $b=\ \ 0.877439-0.744862I$	$5.65624I$	$3.89456-5.95889I$
$u=-0.215080-1.307140I$ $a=\ \ 0.092519-0.562280I$ $b=-0.754878$	$-4.13758+2.82812I$	$-4.97655-4.84887I$
$u=-0.569840$ $a=-1.53980+1.30714I$ $b=\ \ 0.877439-0.744862I$	$4.13758+2.82812I$	$8.08199-1.11003I$
$u=-0.569840$ $a=-1.53980-1.30714I$ $b=\ \ 0.877439+0.744862I$	$4.13758-2.82812I$	$8.08199+1.11003I$

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

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} u^2 + 1 \\ -u^2 - u - 1 \end{pmatrix}$$

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

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

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

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

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

$$a_8 = \begin{pmatrix} u^2 + 1 \\ -u^2 - u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = -0.662359 - 0.562280I$ $b = 0.877439 - 0.744862I$	0	0
$u = -0.215080 - 1.307140I$ $a = -0.662359 + 0.562280I$ $b = 0.877439 + 0.744862I$	0	0
$u = -0.569840$ $a = 1.32472$ $b = -0.754878$	0	0

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^3-u^2+2u-1)^3)(u^{33}+46u^{32}+\cdots+42u+1)$
c_2	$((u^3+u^2-1)^3)(u^{33}+4u^{32}+\cdots+4u-1)$
c_3	$((u^3+u^2+2u+1)^3)(u^{33}-4u^{32}+\cdots+10u-1)$
c_4	$(u^3-3u^2+2u+1)(u^6+u^5+4u^4+u^3+2u^2-2u+1)$ $\cdot(u^{33}-3u^{32}+\cdots-31624u-99623)$
c_5	$((u^3-u^2+1)^3)(u^{33}+4u^{32}+\cdots+4u-1)$
c_6, c_7	$((u^3+u^2+2u+1)^3)(u^{33}+4u^{32}+\cdots-6u-1)$
c_8	$u^9(u^{33}+u^{32}+\cdots+128u^2-512)$
c_9	$((u^3+u^2-1)^3)(u^{33}-4u^{32}+\cdots-744u-137)$
c_{10}	$((u^3-u^2+2u-1)^3)(u^{33}+4u^{32}+\cdots-6u-1)$
c_{11}	$((u^3-u^2+2u-1)^3)(u^{33}-4u^{32}+\cdots+10u-1)$
c_{12}	$((u^3-u-1)^2)(u^3-u^2+2u-1)(u^{33}+26u^{31}+\cdots+1410u-2071)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^3+3y^2+2y-1)^3)(y^{33}-114y^{32}+\cdots+1162y-1)$
c_2, c_5	$((y^3-y^2+2y-1)^3)(y^{33}-46y^{32}+\cdots+42y-1)$
c_3, c_{11}	$((y^3+3y^2+2y-1)^3)(y^{33}+26y^{32}+\cdots+42y-1)$
c_4	$(y^3-5y^2+10y-1)(y^6+7y^5+18y^4+21y^3+16y^2+1)$ $\cdot(y^{33}+39y^{32}+\cdots-19254673246y-9924742129)$
c_6, c_7, c_{10}	$((y^3+3y^2+2y-1)^3)(y^{33}+34y^{32}+\cdots-6y-1)$
c_8	$y^9(y^{33}+49y^{32}+\cdots+131072y-262144)$
c_9	$((y^3-y^2+2y-1)^3)(y^{33}+26y^{32}+\cdots-461086y-18769)$
c_{12}	$(y^3-2y^2+y-1)^2(y^3+3y^2+2y-1)$ $\cdot(y^{33}+52y^{32}+\cdots-8631988y-4289041)$