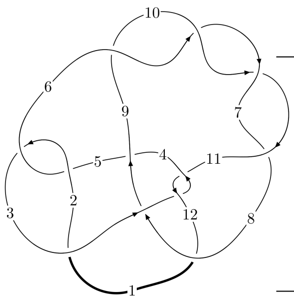
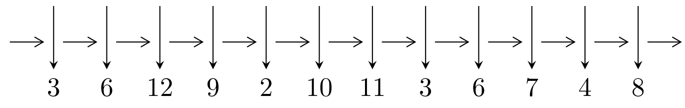
$12n_{0502}$ ($K12n_{0502}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle &-u^9 - 2u^8 + 5u^7 + 11u^6 - 2u^5 - 14u^4 - 15u^3 - 6u^2 + 2b - u - 1, \\ &- u^9 - 2u^8 + 7u^7 + 15u^6 - 14u^5 - 38u^4 + u^3 + 32u^2 + 4a + 11u - 3, \\ &u^{10} + 4u^9 - 2u^8 - 24u^7 - 16u^6 + 35u^5 + 44u^4 + 11u^3 - u^2 + 3u + 1\rangle \\ I_2^u = \langle &b,\ a^3 + a^2u - a^2 - 2u + 3,\ u^2 - u - 1\rangle \end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 16 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.

$$I_1^u = \langle -u^9-2u^8+\cdots+2b-1,\ -u^9-2u^8+\cdots+4a-3,\ u^{10}+4u^9+\cdots+3u+1\rangle$$

(i) Arc colorings

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

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

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

$$a_7 = \begin{pmatrix} -u \\ -u^3+u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{1}{4}u^9+\frac{1}{2}u^8+\cdots-\frac{11}{4}u+\frac{3}{4} \\ \frac{1}{2}u^9+u^8+\cdots+\frac{1}{2}u+\frac{1}{2} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^2+1 \\ -u^4+2u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{4}u^9+\frac{1}{2}u^8+\cdots-\frac{11}{4}u+\frac{3}{4} \\ -\frac{1}{4}u^9-\frac{1}{4}u^8+\cdots+\frac{7}{2}u^2-\frac{3}{4}u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -\frac{7}{4}u^9-\frac{13}{4}u^8+\cdots-\frac{7}{4}u+\frac{1}{2} \\ -\frac{25}{4}u^9-\frac{45}{4}u^8+\cdots-\frac{35}{4}u-3 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{4}u^8-\frac{3}{4}u^7+\cdots-3u-\frac{3}{4} \\ -\frac{1}{4}u^9-\frac{1}{2}u^8+\cdots+\frac{5}{4}u-\frac{1}{4} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{4}u^9-\frac{3}{4}u^8+\cdots-\frac{7}{4}u-1 \\ -\frac{1}{4}u^9-\frac{1}{2}u^8+\cdots+\frac{5}{4}u-\frac{1}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^3-2u \\ u^5-3u^3+u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -\frac{1}{2}u^8-u^7+\cdots+\frac{1}{2}u+\frac{3}{2} \\ \frac{3}{4}u^9+\frac{7}{4}u^8+\cdots+\frac{5}{2}u^2-\frac{3}{4}u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -u^9-5u^8+\frac{61}{2}u^6+29u^5-\frac{91}{2}u^4-68u^3-15u^2+\frac{15}{2}u-\frac{29}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{10}+29u^9+\cdots-19u+4$
c_2, c_5	$u^{10}+3u^9-10u^8-34u^7-17u^6+7u^5+59u^4-55u^3-11u^2-5u-2$
c_3, c_{11}	$u^{10}-3u^9+8u^8-13u^7+18u^6-20u^5+16u^4-11u^3+3u^2-2u-1$
c_4	$u^{10}-25u^9+\cdots-1689u-389$
c_6, c_7, c_9 c_{10}	$u^{10}+4u^9-2u^8-24u^7-16u^6+35u^5+44u^4+11u^3-u^2+3u+1$
c_8	$u^{10}+u^9+\cdots-160u-64$
c_{12}	$u^{10}-2u^9-11u^8+16u^7+23u^6+10u^5-u^4+5u^3+6u^2+4u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{10} - 301y^9 + \cdots - 5681y + 16$
c_2, c_5	$y^{10} - 29y^9 + \cdots + 19y + 4$
c_3, c_{11}	$y^{10} + 7y^9 + 22y^8 + 31y^7 - 76y^5 - 144y^4 - 141y^3 - 67y^2 - 10y + 1$
c_4	$y^{10} - 169y^9 + \cdots - 1357405y + 151321$
c_6, c_7, c_9 c_{10}	$y^{10} - 20y^9 + \cdots - 11y + 1$
c_8	$y^{10} - 35y^9 + \cdots - 5120y + 4096$
c_{12}	$y^{10} - 26y^9 + \cdots - 4y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.770282 + 0.350441I$ $a = -0.175699 + 0.338848I$ $b = 0.722401 + 0.709455I$	$-0.295773 + 0.495817I$	$-13.91306 - 1.36095I$
$u = -0.770282 - 0.350441I$ $a = -0.175699 - 0.338848I$ $b = 0.722401 - 0.709455I$	$-0.295773 - 0.495817I$	$-13.91306 + 1.36095I$
$u = 0.238689 + 0.328179I$ $a = 0.29003 - 2.34120I$ $b = -0.187083 + 0.681344I$	$2.64731 + 2.28565I$	$-6.52151 - 0.97940I$
$u = 0.238689 - 0.328179I$ $a = 0.29003 + 2.34120I$ $b = -0.187083 - 0.681344I$	$2.64731 - 2.28565I$	$-6.52151 + 0.97940I$
$u = -0.293390$ $a = 0.935254$ $b = 0.468829$	-0.595897	-16.6550
$u = 1.78423 + 0.22622I$ $a = -0.335255 + 0.782997I$ $b = -1.44386 + 1.68806I$	$-9.27245 - 2.54510I$	$-15.8897 + 2.0711I$
$u = 1.78423 - 0.22622I$ $a = -0.335255 - 0.782997I$ $b = -1.44386 - 1.68806I$	$-9.27245 + 2.54510I$	$-15.8897 - 2.0711I$
$u = -2.03029 + 0.17685I$ $a = 1.52970 + 0.03504I$ $b = 3.31663 - 1.27082I$	$15.1518 + 6.6636I$	$-15.1690 - 2.5369I$
$u = -2.03029 - 0.17685I$ $a = 1.52970 - 0.03504I$ $b = 3.31663 + 1.27082I$	$15.1518 - 6.6636I$	$-15.1690 + 2.5369I$
$u = -2.15130$ $a = -1.55281$ $b = -4.28499$	10.4531	-17.3580

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= a^2 - 2au + a + u - 17$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_{11}	$(y^3 + 3y^2 + 2y - 1)^2$
c_2, c_5	$(y^3 - y^2 + 2y - 1)^2$
c_4	$y^6 + 6y^5 + 39y^4 + 12y^3 + 11y^2 - 15y + 1$
c_6, c_7, c_9 c_{10}	$(y^2 - 3y + 1)^3$
c_8	y^6
c_{12}	$y^6 - 3y^5 + 15y^4 - 24y^3 + 11y^2 - 6y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.618034$ $a=-1.22142$ $b=0$	-2.10041	-18.8570
$u=-0.618034$ $a=1.41973+1.20521I$ $b=0$	$2.03717-2.82812I$	$-13.8803+6.1171I$
$u=-0.618034$ $a=1.41973-1.20521I$ $b=0$	$2.03717+2.82812I$	$-13.8803-6.1171I$
$u=1.61803$ $a=-0.542287+0.460350I$ $b=0$	$-5.85852+2.82812I$	$-14.0872-1.5287I$
$u=1.61803$ $a=-0.542287-0.460350I$ $b=0$	$-5.85852-2.82812I$	$-14.0872+1.5287I$
$u=1.61803$ $a=0.466540$ $b=0$	-9.99610	-16.2080

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^3-u^2+2u-1)^2)(u^{10}+29u^9+\cdots-19u+4)$
c_2	$(u^3+u^2-1)^2$ $\cdot(u^{10}+3u^9-10u^8-34u^7-17u^6+7u^5+59u^4-55u^3-11u^2-5u-2)$
c_3	$(u^3+u^2+2u+1)^2$ $\cdot(u^{10}-3u^9+8u^8-13u^7+18u^6-20u^5+16u^4-11u^3+3u^2-2u-1)$
c_4	$(u^6+2u^5+\cdots+3u-1)(u^{10}-25u^9+\cdots-1689u-389)$
c_5	$(u^3-u^2+1)^2$ $\cdot(u^{10}+3u^9-10u^8-34u^7-17u^6+7u^5+59u^4-55u^3-11u^2-5u-2)$
c_6, c_7	$(u^2+u-1)^3$ $\cdot(u^{10}+4u^9-2u^8-24u^7-16u^6+35u^5+44u^4+11u^3-u^2+3u+1)$
c_8	$u^6(u^{10}+u^9+\cdots-160u-64)$
c_9, c_{10}	$(u^2-u-1)^3$ $\cdot(u^{10}+4u^9-2u^8-24u^7-16u^6+35u^5+44u^4+11u^3-u^2+3u+1)$
c_{11}	$(u^3-u^2+2u-1)^2$ $\cdot(u^{10}-3u^9+8u^8-13u^7+18u^6-20u^5+16u^4-11u^3+3u^2-2u-1)$
c_{12}	$(u^6+u^5-u^4-4u^3+3u^2-1)$ $\cdot(u^{10}-2u^9-11u^8+16u^7+23u^6+10u^5-u^4+5u^3+6u^2+4u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^3+3y^2+2y-1)^2)(y^{10}-301y^9+\cdots-5681y+16)$
c_2, c_5	$((y^3-y^2+2y-1)^2)(y^{10}-29y^9+\cdots+19y+4)$
c_3, c_{11}	$(y^3+3y^2+2y-1)^2$ $\cdot(y^{10}+7y^9+22y^8+31y^7-76y^5-144y^4-141y^3-67y^2-10y+1)$
c_4	$(y^6+6y^5+39y^4+12y^3+11y^2-15y+1)$ $\cdot(y^{10}-169y^9+\cdots-1357405y+151321)$
c_6, c_7, c_9 c_{10}	$((y^2-3y+1)^3)(y^{10}-20y^9+\cdots-11y+1)$
c_8	$y^6(y^{10}-35y^9+\cdots-5120y+4096)$
c_{12}	$(y^6-3y^5+\cdots-6y+1)(y^{10}-26y^9+\cdots-4y+1)$