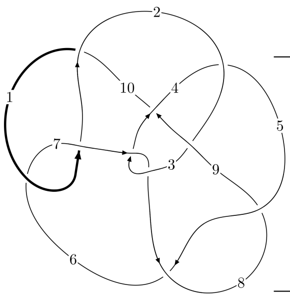
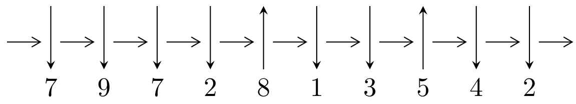
10_{160} $(K10n_{33})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^6 - 2u^5 + 3u^4 - 2u^3 + 3u^2 + b - 1,\ -u^8 + 3u^7 - 5u^6 + 4u^5 - 4u^4 + 2u^3 + u^2 + 2a - 4u - 1,$$
$$u^9 - 5u^8 + 13u^7 - 20u^6 + 22u^5 - 18u^4 + 11u^3 - 5u + 2\rangle$$
$$I_2^u = \langle u^2 + b + u + 1,\ u^3 + 2u^2 + a + 2u + 2,\ u^5 + 2u^4 + 3u^3 + 2u^2 - 1\rangle$$
$$I_3^u = \langle -u^2a + b - 1,\ a^2 + 2au - 2u^2 + 3a - 3u - 2,\ u^3 + u^2 - 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 20 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. $I_1^u = \langle u^6-2u^5+3u^4-2u^3+3u^2+b-1,\ -u^8+3u^7+\cdots+2a-1,\ u^9-5u^8+\cdots-5u+2\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_7 = \begin{pmatrix} \frac{1}{2}u^8 - \frac{3}{2}u^7 + \cdots + 2u + \frac{1}{2} \\ -u^6 + 2u^5 - 3u^4 + 2u^3 - 3u^2 + 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{5}{2}u^8 + \frac{21}{2}u^7 + \cdots - 8u + \frac{13}{2} \\ u^6 - 2u^5 + 3u^4 - 2u^3 + 3u^2 - 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{5}{2}u^8 + \frac{21}{2}u^7 + \cdots - 8u + \frac{15}{2} \\ u^6 - 2u^5 + 3u^4 - 2u^3 + 3u^2 - 1 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -u^8 + 4u^7 - 9u^6 + 12u^5 - 12u^4 + 9u^3 - 4u^2 - u + 3 \\ -2u^8 + 9u^7 - 19u^6 + 24u^5 - 22u^4 + 17u^3 - 6u^2 - 6u + 4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{3}{2}u^8 - \frac{13}{2}u^7 + \cdots + 6u - \frac{5}{2} \\ -u^8 + 4u^7 - 8u^6 + 9u^5 - 8u^4 + 6u^3 - u^2 - 2u + 1 \end{pmatrix}$$

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= u^8 - 5u^7 + 12u^6 - 15u^5 + 12u^4 - 4u^3 + 8u - 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6	$u^9 - u^8 - 7u^7 + 7u^6 + 13u^5 - 13u^4 + 2u^3 + u^2 + 1$
c_2	$u^9 - 5u^8 + 13u^7 - 20u^6 + 22u^5 - 18u^4 + 11u^3 - 5u + 2$
c_3, c_7	$u^9 + 7u^8 + 26u^7 + 61u^6 + 103u^5 + 129u^4 + 125u^3 + 86u^2 + 40u + 8$
c_5, c_8	$u^9 + 6u^7 - 3u^6 + 14u^5 - 10u^4 + 13u^3 - 7u^2 - u + 1$
c_9	$u^9 - 11u^7 + 2u^6 + 35u^5 - 32u^4 + 47u^3 + 8u^2 + u + 13$
c_{10}	$u^9 + 15u^8 + 89u^7 + 253u^6 + 325u^5 + 129u^4 + 16u^3 - 25u^2 - 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6	$y^9 - 15y^8 + 89y^7 - 253y^6 + 325y^5 - 129y^4 + 16y^3 + 25y^2 - 2y - 1$
c_2	$y^9 + y^8 + 13y^7 + 14y^6 + 40y^5 + 50y^4 - 19y^3 - 38y^2 + 25y - 4$
c_3, c_7	$y^9 + 3y^8 + \cdots + 224y - 64$
c_5, c_8	$y^9 + 12y^8 + 64y^7 + 185y^6 + 290y^5 + 210y^4 + 7y^3 - 55y^2 + 15y - 1$
c_9	$y^9 - 22y^8 + \cdots - 207y - 169$
c_{10}	$y^9 - 47y^8 + \cdots + 54y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.204797 + 1.087900I$ $a = -0.055258 + 1.397040I$ $b = 0.689596 - 0.376245I$	$2.64060 + 1.65275I$	$-0.59079 - 4.28210I$
$u = -0.204797 - 1.087900I$ $a = -0.055258 - 1.397040I$ $b = 0.689596 + 0.376245I$	$2.64060 - 1.65275I$	$-0.59079 + 4.28210I$
$u = 0.647333 + 0.135453I$ $a = 1.54477 + 0.21297I$ $b = -0.017613 - 0.474078I$	$-0.87559 - 2.35950I$	$-4.89060 + 1.18144I$
$u = 0.647333 - 0.135453I$ $a = 1.54477 - 0.21297I$ $b = -0.017613 + 0.474078I$	$-0.87559 + 2.35950I$	$-4.89060 - 1.18144I$
$u = -0.531326$ $a = -0.232368$ $b = -0.493195$	-0.846327	-11.7230
$u = 1.20035 + 1.05816I$ $a = 0.77288 - 1.22009I$ $b = 1.96815 + 0.34791I$	$-14.0726 - 9.2039I$	$-9.16258 + 4.28229I$
$u = 1.20035 - 1.05816I$ $a = 0.77288 + 1.22009I$ $b = 1.96815 - 0.34791I$	$-14.0726 + 9.2039I$	$-9.16258 - 4.28229I$
$u = 1.12278 + 1.21739I$ $a = -0.396214 + 0.245006I$ $b = -1.89353 + 0.26305I$	$-13.58820 + 0.68871I$	$-9.49454 - 0.10018I$
$u = 1.12278 - 1.21739I$ $a = -0.396214 - 0.245006I$ $b = -1.89353 - 0.26305I$	$-13.58820 - 0.68871I$	$-9.49454 + 0.10018I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^4 + 3u^3 + 7u^2 + u - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6	$y^5 - 5y^4 + 8y^3 - 7y^2 + 3y - 1$
c_2	$y^5 + 2y^4 + y^3 + 4y - 1$
c_3, c_7	$y^5 + 4y^4 + 4y^3 - y^2 - 2y - 1$
c_5, c_8	$y^5 + 2y^4 + y^3 - 4y^2 - 4y - 1$
c_9	$y^5 - 4y^4 - y^2 - 2y - 1$
c_{10}	$y^5 - 9y^4 - 11y^2 - 5y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.885210 + 0.546617I$ $a = -1.299020 - 0.279409I$ $b = -0.599596 + 0.421125I$	$-1.44657 + 3.45949I$	$-7.29654 - 5.67761I$
$u = -0.885210 - 0.546617I$ $a = -1.299020 + 0.279409I$ $b = -0.599596 - 0.421125I$	$-1.44657 - 3.45949I$	$-7.29654 + 5.67761I$
$u = -0.361950 + 1.318330I$ $a = 0.098088 + 1.045130I$ $b = 0.968932 - 0.363992I$	$1.57933 + 1.42206I$	$-9.07660 - 1.47974I$
$u = -0.361950 - 1.318330I$ $a = 0.098088 - 1.045130I$ $b = 0.968932 + 0.363992I$	$1.57933 - 1.42206I$	$-9.07660 + 1.47974I$
$u = 0.494320$ $a = -3.59813$ $b = -1.73867$	-6.84525	-5.25370

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u - 14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6	$u^6 + u^5 - 4u^4 - 4u^3 + 4u^2 + 8u - 7$
c_2	$(u^3 + u^2 - 1)^2$
c_3, c_7	$(u - 1)^6$
c_5, c_8	$u^6 + 3u^5 + 6u^4 + 12u^3 + 10u^2 + 10u + 1$
c_9	$u^6 + u^5 - 6u^4 + 8u^3 + 2u^2 - 6u - 11$
c_{10}	$u^6 + 9u^5 + 32u^4 + 78u^3 + 136u^2 + 120u + 49$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6	$y^6 - 9y^5 + 32y^4 - 78y^3 + 136y^2 - 120y + 49$
c_2	$(y^3 - y^2 + 2y - 1)^2$
c_3, c_7	$(y-1)^6$
c_5, c_8	$y^6 + 3y^5 - 16y^4 - 82y^3 - 128y^2 - 80y + 1$
c_9	$y^6 - 13y^5 + 24y^4 - 98y^3 + 232y^2 - 80y + 121$
c_{10}	$y^6 - 17y^5 - 108y^4 + 558y^3 + 2912y^2 - 1072y + 2401$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.877439 + 0.744862I$ $a = -0.240939 - 0.027206I$ $b = 0.912616 + 0.309089I$	$-3.55561 + 2.82812I$	$-10.49024 - 2.97945I$
$u = -0.877439 + 0.744862I$ $a = -1.00418 - 1.46252I$ $b = -1.12770 + 0.99805I$	$-3.55561 + 2.82812I$	$-10.49024 - 2.97945I$
$u = -0.877439 - 0.744862I$ $a = -0.240939 + 0.027206I$ $b = 0.912616 - 0.309089I$	$-3.55561 - 2.82812I$	$-10.49024 + 2.97945I$
$u = -0.877439 - 0.744862I$ $a = -1.00418 + 1.46252I$ $b = -1.12770 - 0.99805I$	$-3.55561 - 2.82812I$	$-10.49024 + 2.97945I$
$u = 0.754878$ $a = 0.983762$ $b = 1.56059$	-7.69319	-17.0200
$u = 0.754878$ $a = -5.49352$ $b = -2.13043$	-7.69319	-17.0200

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4	$(u^5+u^4-2u^3-u^2+u+1)(u^6+u^5-4u^4-4u^3+4u^2+8u-7)$ $\cdot(u^9-u^8-7u^7+7u^6+13u^5-13u^4+2u^3+u^2+1)$
c_2	$(u^3+u^2-1)^2(u^5+2u^4+3u^3+2u^2-1)$ $\cdot(u^9-5u^8+13u^7-20u^6+22u^5-18u^4+11u^3-5u+2)$
c_3	$(u-1)^6(u^5+2u^3+u^2+1)$ $\cdot(u^9+7u^8+26u^7+61u^6+103u^5+129u^4+125u^3+86u^2+40u+8)$
c_5	$(u^5+u^3-2u^2-1)(u^6+3u^5+6u^4+12u^3+10u^2+10u+1)$ $\cdot(u^9+6u^7-3u^6+14u^5-10u^4+13u^3-7u^2-u+1)$
c_6	$(u^5-u^4-2u^3+u^2+u-1)(u^6+u^5-4u^4-4u^3+4u^2+8u-7)$ $\cdot(u^9-u^8-7u^7+7u^6+13u^5-13u^4+2u^3+u^2+1)$
c_7	$(u-1)^6(u^5+2u^3-u^2-1)$ $\cdot(u^9+7u^8+26u^7+61u^6+103u^5+129u^4+125u^3+86u^2+40u+8)$
c_8	$(u^5+u^3+2u^2+1)(u^6+3u^5+6u^4+12u^3+10u^2+10u+1)$ $\cdot(u^9+6u^7-3u^6+14u^5-10u^4+13u^3-7u^2-u+1)$
c_9	$(u^5-2u^3+3u^2-2u+1)(u^6+u^5-6u^4+8u^3+2u^2-6u-11)$ $\cdot(u^9-11u^7+2u^6+35u^5-32u^4+47u^3+8u^2+u+13)$
c_{10}	$(u^5-5u^4+8u^3-7u^2+3u-1)$ $\cdot(u^6+9u^5+32u^4+78u^3+136u^2+120u+49)$ $\cdot(u^9+15u^8+89u^7+253u^6+325u^5+129u^4+16u^3-25u^2-2u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6	$(y^5 - 5y^4 + 8y^3 - 7y^2 + 3y - 1)$ $\cdot (y^6 - 9y^5 + 32y^4 - 78y^3 + 136y^2 - 120y + 49)$ $\cdot (y^9 - 15y^8 + 89y^7 - 253y^6 + 325y^5 - 129y^4 + 16y^3 + 25y^2 - 2y - 1)$
c_2	$(y^3 - y^2 + 2y - 1)^2(y^5 + 2y^4 + y^3 + 4y - 1)$ $\cdot (y^9 + y^8 + 13y^7 + 14y^6 + 40y^5 + 50y^4 - 19y^3 - 38y^2 + 25y - 4)$
c_3, c_7	$((y-1)^6)(y^5 + 4y^4 + \cdots - 2y - 1)(y^9 + 3y^8 + \cdots + 224y - 64)$
c_5, c_8	$(y^5 + 2y^4 + y^3 - 4y^2 - 4y - 1)$ $\cdot (y^6 + 3y^5 - 16y^4 - 82y^3 - 128y^2 - 80y + 1)$ $\cdot (y^9 + 12y^8 + 64y^7 + 185y^6 + 290y^5 + 210y^4 + 7y^3 - 55y^2 + 15y - 1)$
c_9	$(y^5 - 4y^4 - y^2 - 2y - 1)(y^6 - 13y^5 + \cdots - 80y + 121)$ $\cdot (y^9 - 22y^8 + \cdots - 207y - 169)$
c_{10}	$(y^5 - 9y^4 - 11y^2 - 5y - 1)$ $\cdot (y^6 - 17y^5 - 108y^4 + 558y^3 + 2912y^2 - 1072y + 2401)$ $\cdot (y^9 - 47y^8 + \cdots + 54y - 1)$