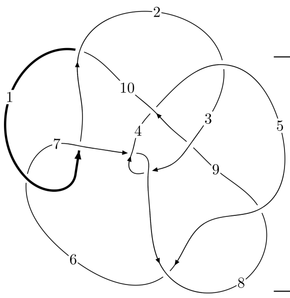
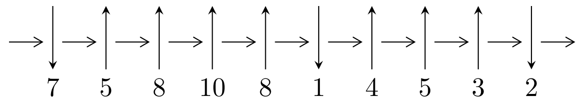
10_{156} $(K10n_{32})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -4u^9 - 2u^8 - u^7 + 9u^6 - 29u^5 - u^4 + 13u^3 + 51u^2 + 27b - 19u + 8,$$
$$- 11u^9 + 8u^8 + 4u^7 - 9u^6 - 46u^5 + 31u^4 + 29u^3 + 12u^2 + 27a - 32u - 5,\ u^{10} + u^7 + 5u^6 - u^3 + u^2 - u + 1$$
$$I_2^u = \langle u^2 + b + 1,\ u^3 + a + 2u + 1,\ u^5 + 2u^3 + u^2 + 1\rangle$$
$$I_3^u = \langle -3646u^{11} + 4692u^{10} + \cdots + 3395b + 12871,\ 24747u^{11} - 25539u^{10} + \cdots + 16975a - 130862,$$
$$u^{12} - u^{11} + 2u^{10} - 3u^9 + 6u^8 - 3u^7 + 9u^6 - 5u^5 - 2u^4 - 8u^2 - 6u - 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 27 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. $I_1^u = \langle -4u^9 - 2u^8 + \cdots + 27b + 8,\ -11u^9 + 8u^8 + \cdots + 27a - 5,\ u^{10} + u^7 + 5u^6 - u^3 + u^2 - u + 1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} 0.407407u^9 - 0.296296u^8 + \cdots + 1.18519u + 0.185185 \\ 0.148148u^9 + 0.0740741u^8 + \cdots + 0.703704u - 0.296296 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.407407u^9 - 0.296296u^8 + \cdots + 1.18519u + 0.185185 \\ 0.296296u^9 + 0.148148u^8 + \cdots + 1.40741u - 0.592593 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.518519u^9 - 0.259259u^8 + \cdots - 0.962963u + 0.0370370 \\ -0.296296u^9 - 0.148148u^8 + \cdots + 0.592593u - 0.407407 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.814815u^9 - 0.407407u^8 + \cdots - 0.370370u - 0.370370 \\ -0.296296u^9 - 0.148148u^8 + \cdots + 0.592593u - 0.407407 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.407407u^9 - 0.296296u^8 + \cdots + 1.18519u + 0.185185 \\ \frac{1}{9}u^9 + \frac{5}{9}u^8 + \cdots + \frac{7}{9}u - \frac{2}{9} \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u \\ 0.370370u^9 + 0.185185u^8 + \cdots + 0.259259u + 0.259259 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{23}{9}u^9 - \frac{25}{9}u^8 + \frac{10}{9}u^7 - 3u^6 - \frac{133}{9}u^5 - \frac{116}{9}u^4 + \frac{41}{9}u^3 + \frac{1}{3}u^2 + \frac{19}{9}u + \frac{28}{9}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^{10} - 4u^9 + 6u^8 - 12u^6 + 15u^5 + u^4 - 21u^3 + 25u^2 - 14u + 4$
c_2	$u^{10} + 6u^9 + 14u^8 + 18u^7 + 22u^6 + 31u^5 + 26u^4 + 7u^3 + 4u^2 + 12u + 8$
c_3, c_4, c_7	$u^{10} + u^7 + 5u^6 - u^3 + u^2 - u + 1$
c_5, c_8, c_9	$u^{10} + 2u^9 - 7u^8 - 18u^7 + 9u^6 + 46u^5 + 25u^4 - 13u^3 - 10u^2 + u + 1$
c_{10}	$u^{10} + 4u^9 + \cdots - 4u + 16$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{10} - 4y^9 + \cdots + 4y + 16$
c_2	$y^{10} - 8y^9 + \cdots - 80y + 64$
c_3, c_4, c_7	$y^{10} + 10y^8 - y^7 + 27y^6 + 4y^5 + 12y^4 + 9y^3 - y^2 + y + 1$
c_5, c_8, c_9	$y^{10} - 18y^9 + \cdots - 21y + 1$
c_{10}	$y^{10} + 8y^9 + \cdots + 1424y + 256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.723110+0.623649I$ $a=\ \ 0.401950+0.330159I$ $b=-0.485574+1.220240I$	$-0.90131-5.21099I$	$4.11400+8.12783I$
$u=-0.723110-0.623649I$ $a=\ \ 0.401950-0.330159I$ $b=-0.485574-1.220240I$	$-0.90131+5.21099I$	$4.11400-8.12783I$
$u=\ \ 0.067084+0.694939I$ $a=\ \ 0.43471+1.53803I$ $b=\ \ 0.829826+0.602084I$	$-1.96302+2.37863I$	$-1.27520-1.22709I$
$u=\ \ 0.067084-0.694939I$ $a=\ \ 0.43471-1.53803I$ $b=\ \ 0.829826-0.602084I$	$-1.96302-2.37863I$	$-1.27520+1.22709I$
$u=\ \ 0.630715+0.297914I$ $a=\ \ 0.574400-0.195586I$ $b=-0.560066-0.531210I$	$1.185420+0.648518I$	$7.38806-2.73057I$
$u=\ \ 0.630715-0.297914I$ $a=\ \ 0.574400+0.195586I$ $b=-0.560066+0.531210I$	$1.185420-0.648518I$	$7.38806+2.73057I$
$u=-1.034740+0.876758I$ $a=-1.31917-0.80288I$ $b=\ \ 1.55315-0.33666I$	$7.82103-4.41044I$	$6.40190+3.03613I$
$u=-1.034740-0.876758I$ $a=-1.31917+0.80288I$ $b=\ \ 1.55315+0.33666I$	$7.82103+4.41044I$	$6.40190-3.03613I$
$u=\ \ 1.06005+1.17909I$ $a=-1.091890+0.674915I$ $b=\ \ 1.66266+0.40960I$	$6.19490+11.16340I$	$4.37125-6.32339I$
$u=\ \ 1.06005-1.17909I$ $a=-1.091890-0.674915I$ $b=\ \ 1.66266-0.40960I$	$6.19490-11.16340I$	$4.37125+6.32339I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u^4 - 8u^3 - u^2 - 13u - 2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.859460$ $a = 1.35378$ $b = -1.73867$	3.55538	12.9680
$u = 0.300574 + 0.700535I$ $a = -1.18578 - 1.24715I$ $b = -0.599596 - 0.421125I$	$-1.84330 + 3.45949I$	$-2.16713 - 7.95950I$
$u = 0.300574 - 0.700535I$ $a = -1.18578 + 1.24715I$ $b = -0.599596 + 0.421125I$	$-1.84330 - 3.45949I$	$-2.16713 + 7.95950I$
$u = 0.12916 + 1.40912I$ $a = -0.491105 - 0.090789I$ $b = 0.968932 - 0.363992I$	$-4.86920 - 1.42206I$	$0.68335 + 4.57040I$
$u = 0.12916 - 1.40912I$ $a = -0.491105 + 0.090789I$ $b = 0.968932 + 0.363992I$	$-4.86920 + 1.42206I$	$0.68335 - 4.57040I$

III. $\boldsymbol{I^u_3 = \langle -3646u^{11} + 4692u^{10} + \cdots + 3395b + 12871,\ 24747u^{11} - 25539u^{10} + \cdots + 16975a - 130862,\ u^{12} - u^{11} + \cdots - 6u - 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} -1.45785u^{11} + 1.50451u^{10} + \cdots + 14.1214u + 7.70910 \\ 1.07393u^{11} - 1.38203u^{10} + \cdots - 8.88218u - 3.79116 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -1.45785u^{11} + 1.50451u^{10} + \cdots + 14.1214u + 7.70910 \\ 0.867570u^{11} - 1.01290u^{10} + \cdots - 7.70427u - 3.83782 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 3.86074u^{11} - 5.29791u^{10} + \cdots - 30.9502u - 11.2213 \\ -1.06957u^{11} + 1.43281u^{10} + \cdots + 8.75287u + 3.35647 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 2.79116u^{11} - 3.86510u^{10} + \cdots - 22.1973u - 7.86480 \\ -1.06957u^{11} + 1.43281u^{10} + \cdots + 8.75287u + 3.35647 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 3.35647u^{11} - 4.42604u^{10} + \cdots - 25.6789u - 11.3859 \\ -1.07393u^{11} + 1.38203u^{10} + \cdots + 8.88218u + 4.79116 \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 3.74451u^{11} - 5.02480u^{10} + \cdots - 29.1594u - 12.4070 \\ -1.56960u^{11} + 1.99193u^{10} + \cdots + 13.2389u + 6.02292 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{9904}{2425}u^{11} - \frac{13668}{2425}u^{10} + \frac{25616}{2425}u^9 - \frac{40328}{2425}u^8 + \frac{74912}{2425}u^7 - \frac{59884}{2425}u^6 + \frac{22984}{485}u^5 - \frac{3816}{97}u^4 + \frac{18152}{2425}u^3 - \frac{12692}{2425}u^2 - \frac{15928}{485}u - \frac{20814}{2425}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u^3+u^2-1)^4$
c_2	$(u^2-u-1)^6$
c_3, c_4, c_7	$u^{12}-u^{11}+2u^{10}-3u^9+6u^8-3u^7+9u^6-5u^5-2u^4-8u^2-6u-1$
c_5, c_8, c_9	$u^{12}+u^{11}+\cdots-46u-19$
c_{10}	$(u^3+u^2+2u+1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^3 - y^2 + 2y - 1)^4$
c_2	$(y^2 - 3y + 1)^6$
c_3, c_4, c_7	$y^{12} + 3y^{11} + \cdots - 20y + 1$
c_5, c_8, c_9	$y^{12} - 9y^{11} + \cdots + 240y + 361$
c_{10}	$(y^3 + 3y^2 + 2y - 1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.384581 + 0.967717I$ $a = 0.472201 + 0.655526I$ $b = 0.618034$	$-0.92371 + 2.82812I$	$5.50976 - 2.97945I$
$u = 0.384581 - 0.967717I$ $a = 0.472201 - 0.655526I$ $b = 0.618034$	$-0.92371 - 2.82812I$	$5.50976 + 2.97945I$
$u = 1.17224$ $a = 1.13192$ $b = -1.61803$	2.83439	-1.01950
$u = -0.176090 + 1.382660I$ $a = -0.566384 + 0.405556I$ $b = 0.618034$	-5.06130	$-6 - 1.019511 + 0.10I$
$u = -0.176090 - 1.382660I$ $a = -0.566384 - 0.405556I$ $b = 0.618034$	-5.06130	$-6 - 1.019511 + 0.10I$
$u = -0.517507 + 0.159859I$ $a = -0.95090 + 2.42302I$ $b = 0.618034$	$-0.92371 - 2.82812I$	$5.50976 + 2.97945I$
$u = -0.517507 - 0.159859I$ $a = -0.95090 - 2.42302I$ $b = 0.618034$	$-0.92371 + 2.82812I$	$5.50976 - 2.97945I$
$u = -0.92154 + 1.14616I$ $a = 1.017000 + 0.670899I$ $b = -1.61803$	$6.97197 - 2.82812I$	$5.50976 + 2.97945I$
$u = -0.92154 - 1.14616I$ $a = 1.017000 - 0.670899I$ $b = -1.61803$	$6.97197 + 2.82812I$	$5.50976 - 2.97945I$
$u = 1.26955 + 0.96884I$ $a = 1.014420 - 0.568969I$ $b = -1.61803$	$6.97197 - 2.82812I$	$5.50976 + 2.97945I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.26955 - 0.96884I$ $a = 1.014420 + 0.568969I$ $b = -1.61803$	$6.97197 + 2.82812I$	$5.50976 - 2.97945I$
$u = -0.250219$ $a = 3.89540$ $b = -1.61803$	2.83439	-1.01950

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^3+u^2-1)^4(u^5+u^4-u^3-2u^2+u+1)$ $\cdot(u^{10}-4u^9+6u^8-12u^6+15u^5+u^4-21u^3+25u^2-14u+4)$
c_2	$(u^2-u-1)^6(u^5+u^4-2u^3-u^2+u+1)$ $\cdot(u^{10}+6u^9+14u^8+18u^7+22u^6+31u^5+26u^4+7u^3+4u^2+12u+8)$
c_3	$(u^5+2u^3+u^2+1)(u^{10}+u^7+5u^6-u^3+u^2-u+1)$ $\cdot(u^{12}-u^{11}+2u^{10}-3u^9+6u^8-3u^7+9u^6-5u^5-2u^4-8u^2-6u-1)$
c_4, c_7	$(u^5+2u^3-u^2-1)(u^{10}+u^7+5u^6-u^3+u^2-u+1)$ $\cdot(u^{12}-u^{11}+2u^{10}-3u^9+6u^8-3u^7+9u^6-5u^5-2u^4-8u^2-6u-1)$
c_5, c_9	$(u^5+u^3+2u^2+1)$ $\cdot(u^{10}+2u^9-7u^8-18u^7+9u^6+46u^5+25u^4-13u^3-10u^2+u+1)$ $\cdot(u^{12}+u^{11}+\cdots-46u-19)$
c_6	$(u^3+u^2-1)^4(u^5-u^4-u^3+2u^2+u-1)$ $\cdot(u^{10}-4u^9+6u^8-12u^6+15u^5+u^4-21u^3+25u^2-14u+4)$
c_8	$(u^5+u^3-2u^2-1)$ $\cdot(u^{10}+2u^9-7u^8-18u^7+9u^6+46u^5+25u^4-13u^3-10u^2+u+1)$ $\cdot(u^{12}+u^{11}+\cdots-46u-19)$
c_{10}	$(u^3+u^2+2u+1)^4(u^5-3u^4+7u^3-8u^2+5u-1)$ $\cdot(u^{10}+4u^9+\cdots-4u+16)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$(y^3 - y^2 + 2y - 1)^4(y^5 - 3y^4 + 7y^3 - 8y^2 + 5y - 1)$ $\cdot (y^{10} - 4y^9 + \cdots + 4y + 16)$
c_2	$(y^2 - 3y + 1)^6(y^5 - 5y^4 + 8y^3 - 7y^2 + 3y - 1)$ $\cdot (y^{10} - 8y^9 + \cdots - 80y + 64)$
c_3, c_4, c_7	$(y^5 + 4y^4 + 4y^3 - y^2 - 2y - 1)$ $\cdot (y^{10} + 10y^8 - y^7 + 27y^6 + 4y^5 + 12y^4 + 9y^3 - y^2 + y + 1)$ $\cdot (y^{12} + 3y^{11} + \cdots - 20y + 1)$
c_5, c_8, c_9	$(y^5 + 2y^4 + y^3 - 4y^2 - 4y - 1)(y^{10} - 18y^9 + \cdots - 21y + 1)$ $\cdot (y^{12} - 9y^{11} + \cdots + 240y + 361)$
c_{10}	$(y^3 + 3y^2 + 2y - 1)^4(y^5 + 5y^4 + 11y^3 + 9y - 1)$ $\cdot (y^{10} + 8y^9 + \cdots + 1424y + 256)$