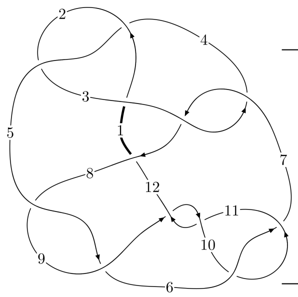
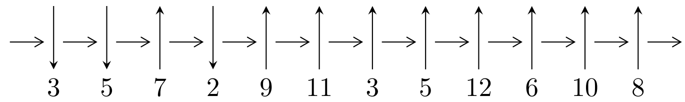
$12n_{0159}$ ($K12n_{0159}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^{34} + 2u^{33} + \cdots + b - 1,\ -u^{34} + 5u^{32} + \cdots + a + 3u,\ u^{35} + 2u^{34} + \cdots - 2u - 1\rangle$$
$$I_2^u = \langle -u^5 + u^3 - u^2 + b - u,\ -u^7 + u^5 - u^4 - u^3 + a - 1,\ u^8 - u^7 - u^6 + 2u^5 + u^4 - 2u^3 + 2u - 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 43 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.

$$I_1^u = \langle u^{34}+2u^{33}+\cdots+b-1,\ -u^{34}+5u^{32}+\cdots+a+3u,\ u^{35}+2u^{34}+\cdots-2u-1\rangle$$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ -u^3+u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^2+1 \\ -u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^4-u^2+1 \\ u^4 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^{34}-5u^{32}+\cdots+3u^2-3u \\ -u^{34}-2u^{33}+\cdots+2u+1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^9+2u^7-3u^5+2u^3-u \\ -u^9+u^7-u^5+u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^{34}+u^{33}+\cdots-3u-1 \\ -u^{29}+5u^{27}+\cdots-u^3+3u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^{26}-5u^{24}+\cdots+3u^2-1 \\ u^{26}-4u^{24}+\cdots+2u^4+u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^{34}+u^{33}+\cdots-4u-1 \\ u^{34}+u^{33}+\cdots-u-1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^{14}+3u^{12}-6u^{10}+7u^8-6u^6+4u^4-2u^2+1 \\ -u^{14}+2u^{12}-3u^{10}+2u^8+u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -7u^{34}-6u^{33}+39u^{32}+43u^{31}-141u^{30}-173u^{29}+355u^{28}+506u^{27}-686u^{26}-1134u^{25}+1034u^{24}+2071u^{23}-1204u^{22}-3115u^{21}+1010u^{20}+3917u^{19}-424u^{18}-4134u^{17}-365u^{16}+3614u^{15}+1028u^{14}-2600u^{13}-1314u^{12}+1451u^{11}+1204u^{10}-562u^9-821u^8+77u^7+436u^6+85u^5-158u^4-75u^3+20u^2+26u+9$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{35} + 49u^{34} + \cdots + 102u + 1$
c_2, c_4	$u^{35} - 9u^{34} + \cdots - 14u + 1$
c_3, c_7	$u^{35} - u^{34} + \cdots - 640u + 256$
c_5, c_8	$u^{35} - 2u^{34} + \cdots + 108u - 36$
c_6, c_{10}	$u^{35} + 2u^{34} + \cdots - 2u - 1$
c_9, c_{11}	$u^{35} - 12u^{34} + \cdots + 2u - 1$
c_{12}	$u^{35} + 36u^{33} + \cdots - 4u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{35} - 117y^{34} + \cdots + 6150y - 1$
c_2, c_4	$y^{35} - 49y^{34} + \cdots + 102y - 1$
c_3, c_7	$y^{35} + 51y^{34} + \cdots + 835584y - 65536$
c_5, c_8	$y^{35} - 12y^{34} + \cdots + 6840y - 1296$
c_6, c_{10}	$y^{35} - 12y^{34} + \cdots + 2y - 1$
c_9, c_{11}	$y^{35} + 24y^{34} + \cdots + 2y - 1$
c_{12}	$y^{35} + 72y^{34} + \cdots + 2y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.003180 + 0.076770I$ $a = -0.427602 + 0.732202I$ $b = 0.040765 - 1.055450I$	$1.87836 + 2.29361I$	$9.35864 - 3.99437I$
$u = 1.003180 - 0.076770I$ $a = -0.427602 - 0.732202I$ $b = 0.040765 + 1.055450I$	$1.87836 - 2.29361I$	$9.35864 + 3.99437I$
$u = -0.792898 + 0.645336I$ $a = -0.232938 - 0.928895I$ $b = 0.112888 - 0.720959I$	$-1.72435 - 2.14542I$	$5.01876 + 4.63119I$
$u = -0.792898 - 0.645336I$ $a = -0.232938 + 0.928895I$ $b = 0.112888 + 0.720959I$	$-1.72435 + 2.14542I$	$5.01876 - 4.63119I$
$u = -0.698567 + 0.764106I$ $a = 0.18575 + 2.20654I$ $b = -1.02864 + 2.02071I$	$-3.83985 + 2.10941I$	$1.06203 - 1.84479I$
$u = -0.698567 - 0.764106I$ $a = 0.18575 - 2.20654I$ $b = -1.02864 - 2.02071I$	$-3.83985 - 2.10941I$	$1.06203 + 1.84479I$
$u = 0.753011 + 0.738009I$ $a = 1.37904 - 1.86948I$ $b = -0.93662 - 2.24841I$	$-4.73261 + 0.86629I$	$0.579778 - 0.147183I$
$u = 0.753011 - 0.738009I$ $a = 1.37904 + 1.86948I$ $b = -0.93662 + 2.24841I$	$-4.73261 - 0.86629I$	$0.579778 + 0.147183I$
$u = -0.650584 + 0.839948I$ $a = -0.26514 - 2.94245I$ $b = 1.70386 - 2.51843I$	$-13.3967 + 6.2863I$	$1.00799 - 1.99078I$
$u = -0.650584 - 0.839948I$ $a = -0.26514 + 2.94245I$ $b = 1.70386 + 2.51843I$	$-13.3967 - 6.2863I$	$1.00799 + 1.99078I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.597910 + 0.716545I$ $a = -0.474108 + 0.553918I$ $b = 0.273509 + 0.526339I$	$0.466250 - 0.951396I$	$10.00295 + 0.38249I$
$u = 0.597910 - 0.716545I$ $a = -0.474108 - 0.553918I$ $b = 0.273509 - 0.526339I$	$0.466250 + 0.951396I$	$10.00295 - 0.38249I$
$u = -0.922847$ $a = -1.31041$ $b = -1.21035$	0.182011	10.8590
$u = -1.08201$ $a = 0.437613$ $b = 0.472974$	5.82108	17.0620
$u = 1.111560 + 0.128216I$ $a = 1.138050 - 0.133066I$ $b = 0.300334 + 1.303030I$	$-6.72567 + 5.75996I$	$7.32314 - 3.54445I$
$u = 1.111560 - 0.128216I$ $a = 1.138050 + 0.133066I$ $b = 0.300334 - 1.303030I$	$-6.72567 - 5.75996I$	$7.32314 + 3.54445I$
$u = -0.934946 + 0.641378I$ $a = -0.922641 - 0.641680I$ $b = 0.090797 - 0.681520I$	$-1.26680 - 2.86899I$	$5.76020 + 1.94310I$
$u = -0.934946 - 0.641378I$ $a = -0.922641 + 0.641680I$ $b = 0.090797 + 0.681520I$	$-1.26680 + 2.86899I$	$5.76020 - 1.94310I$
$u = -1.036700 + 0.513296I$ $a = 0.468566 + 0.238758I$ $b = 0.355938 - 0.949026I$	$-9.06115 - 1.11837I$	$4.93303 + 2.48933I$
$u = -1.036700 - 0.513296I$ $a = 0.468566 - 0.238758I$ $b = 0.355938 + 0.949026I$	$-9.06115 + 1.11837I$	$4.93303 - 2.48933I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.958291 + 0.699514I$ $a = 1.42433 - 1.41318I$ $b = -0.04365 - 2.87306I$	$-4.10408 + 4.62202I$	$2.53243 - 5.37025I$
$u = 0.958291 - 0.699514I$ $a = 1.42433 + 1.41318I$ $b = -0.04365 + 2.87306I$	$-4.10408 - 4.62202I$	$2.53243 + 5.37025I$
$u = 0.878474 + 0.799434I$ $a = -2.09357 + 2.58300I$ $b = 0.51980 + 3.81456I$	$-17.4916 + 2.9871I$	$-0.26712 - 2.67515I$
$u = 0.878474 - 0.799434I$ $a = -2.09357 - 2.58300I$ $b = 0.51980 - 3.81456I$	$-17.4916 - 2.9871I$	$-0.26712 + 2.67515I$
$u = 1.021530 + 0.658784I$ $a = -0.388047 + 0.431455I$ $b = -0.012993 + 0.931220I$	$1.70279 + 6.25040I$	$12.13050 - 4.97456I$
$u = 1.021530 - 0.658784I$ $a = -0.388047 - 0.431455I$ $b = -0.012993 - 0.931220I$	$1.70279 - 6.25040I$	$12.13050 + 4.97456I$
$u = -0.993451 + 0.702180I$ $a = 2.14762 + 0.79394I$ $b = 0.45485 + 2.36980I$	$-2.94898 - 7.68050I$	$3.12136 + 6.96771I$
$u = -0.993451 - 0.702180I$ $a = 2.14762 - 0.79394I$ $b = 0.45485 - 2.36980I$	$-2.94898 + 7.68050I$	$3.12136 - 6.96771I$
$u = -0.263163 + 0.716876I$ $a = -1.150580 + 0.479086I$ $b = 0.686293 - 0.231426I$	$-11.29280 - 3.30354I$	$1.02998 + 2.25929I$
$u = -0.263163 - 0.716876I$ $a = -1.150580 - 0.479086I$ $b = 0.686293 + 0.231426I$	$-11.29280 + 3.30354I$	$1.02998 - 2.25929I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.039590+0.718934I$ $a=-2.70067-0.80992I$ $b=-1.22822-3.37949I$	$-12.2131-12.1134I$	$2.82361+6.65221I$
$u=-1.039590-0.718934I$ $a=-2.70067+0.80992I$ $b=-1.22822+3.37949I$	$-12.2131+12.1134I$	$2.82361-6.65221I$
$u=\ \ 0.515516$ $a=-0.450972$ $b=\ \ 0.317465$	0.694754	14.6380
$u=-0.169379+0.388841I$ $a=\ \ 0.57383-1.55781I$ $b=-0.578952-0.351526I$	$-1.66775-0.90576I$	$-1.19698+2.88649I$
$u=-0.169379-0.388841I$ $a=\ \ 0.57383+1.55781I$ $b=-0.578952+0.351526I$	$-1.66775+0.90576I$	$-1.19698-2.88649I$

II. $\boldsymbol{I_2^u = \langle -u^5 + u^3 - u^2 + b - u,\ -u^7 + u^5 - u^4 - u^3 + a - 1,\ u^8 - u^7 - u^6 + 2u^5 + u^4 - 2u^3 + 2u - 1\rangle}$

(i) Arc colorings

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

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

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

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

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

$$a_9 = \begin{pmatrix} u^4 - u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^7 - u^5 + u^4 + u^3 + 1 \\ u^5 - u^3 + u^2 + u \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} u^7 - u^6 - u^5 + 2u^4 + u^3 - 2u^2 + 2 \\ u^7 - u^6 - u^5 + u^4 + u^3 - u^2 - u + 1 \end{pmatrix}$$

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 2u^7 + u^6 - 5u^5 + 5u^3 - u^2 - 4u + 5$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^8$
c_3, c_7	y^8
c_5, c_8, c_{12}	$y^8 - 7y^7 + 19y^6 - 22y^5 + 3y^4 + 14y^3 - 6y^2 - 4y + 1$
c_6, c_{10}	$y^8 - 3y^7 + 7y^6 - 10y^5 + 11y^4 - 10y^3 + 6y^2 - 4y + 1$
c_9, c_{11}	$y^8 + 5y^7 + 11y^6 + 6y^5 - 17y^4 - 34y^3 - 22y^2 - 4y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.570868 + 0.730671I$ $a = 0.325934 + 0.693334I$ $b = 0.972127 + 0.565636I$	$-0.604279 - 1.131230I$	$1.47926 + 0.84929I$
$u = 0.570868 - 0.730671I$ $a = 0.325934 - 0.693334I$ $b = 0.972127 - 0.565636I$	$-0.604279 + 1.131230I$	$1.47926 - 0.84929I$
$u = -0.855237 + 0.665892I$ $a = -1.03462 - 0.99451I$ $b = 0.39611 - 1.88650I$	$-3.80435 - 2.57849I$	$2.50535 + 3.23297I$
$u = -0.855237 - 0.665892I$ $a = -1.03462 + 0.99451I$ $b = 0.39611 + 1.88650I$	$-3.80435 + 2.57849I$	$2.50535 - 3.23297I$
$u = -1.09818$ $a = 0.801005$ $b = -0.165005$	4.85780	7.45240
$u = 1.031810 + 0.655470I$ $a = -0.842429 - 0.289836I$ $b = -0.699541 + 1.033710I$	$0.73474 + 6.44354I$	$3.27544 - 5.90525I$
$u = 1.031810 - 0.655470I$ $a = -0.842429 + 0.289836I$ $b = -0.699541 - 1.033710I$	$0.73474 - 6.44354I$	$3.27544 + 5.90525I$
$u = 0.603304$ $a = 1.30123$ $b = 0.827616$	-0.799899	3.02750

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^8)(u^{35}+49u^{34}+\cdots+102u+1)$
c_2	$((u-1)^8)(u^{35}-9u^{34}+\cdots-14u+1)$
c_3, c_7	$u^8(u^{35}-u^{34}+\cdots-640u+256)$
c_4	$((u+1)^8)(u^{35}-9u^{34}+\cdots-14u+1)$
c_5	$(u^8-u^7-3u^6+2u^5+3u^4-2u-1)(u^{35}-2u^{34}+\cdots+108u-36)$
c_6	$(u^8+u^7+\cdots-2u-1)(u^{35}+2u^{34}+\cdots-2u-1)$
c_8	$(u^8+u^7-3u^6-2u^5+3u^4+2u-1)(u^{35}-2u^{34}+\cdots+108u-36)$
c_9	$(u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1)$ $\cdot(u^{35}-12u^{34}+\cdots+2u-1)$
c_{10}	$(u^8-u^7+\cdots+2u-1)(u^{35}+2u^{34}+\cdots-2u-1)$
c_{11}	$(u^8-3u^7+7u^6-10u^5+11u^4-10u^3+6u^2-4u+1)$ $\cdot(u^{35}-12u^{34}+\cdots+2u-1)$
c_{12}	$(u^8+u^7-3u^6-2u^5+3u^4+2u-1)(u^{35}+36u^{33}+\cdots-4u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^8)(y^{35}-117y^{34}+\cdots+6150y-1)$
c_2, c_4	$((y-1)^8)(y^{35}-49y^{34}+\cdots+102y-1)$
c_3, c_7	$y^8(y^{35}+51y^{34}+\cdots+835584y-65536)$
c_5, c_8	$(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)$ $\cdot(y^{35}-12y^{34}+\cdots+6840y-1296)$
c_6, c_{10}	$(y^8-3y^7+7y^6-10y^5+11y^4-10y^3+6y^2-4y+1)$ $\cdot(y^{35}-12y^{34}+\cdots+2y-1)$
c_9, c_{11}	$(y^8+5y^7+11y^6+6y^5-17y^4-34y^3-22y^2-4y+1)$ $\cdot(y^{35}+24y^{34}+\cdots+2y-1)$
c_{12}	$(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)$ $\cdot(y^{35}+72y^{34}+\cdots+2y-1)$