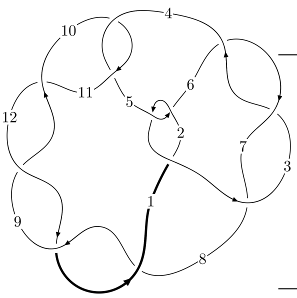
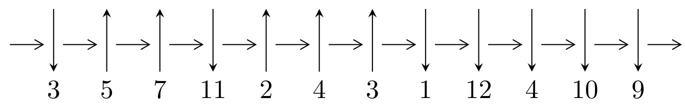
$12n_{0333}$ ($K12n_{0333}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & u^{14} - u^{13} - u^{12} + 3u^{11} + 3u^{10} - 5u^9 - 2u^8 + 7u^7 + 3u^6 - 6u^5 - 2u^4 + 4u^3 + b - u + 1, \\
& -u^{15} + u^{14} + u^{13} - 2u^{12} - 3u^{11} + 4u^{10} + 4u^9 - 4u^8 - 3u^7 + 4u^6 + 6u^5 - 2u^4 + 2a - 1, \\
& u^{16} - 3u^{15} + 3u^{14} + 2u^{13} - 3u^{12} - 6u^{11} + 12u^{10} - 9u^8 - 2u^7 + 12u^6 - 2u^5 - 8u^4 + 4u^3 + 2u^2 - 3u + 2\rangle \\
I_2^u = \langle & b + 1,\ 2u^5a + 4u^6 + 2u^4a + 7u^5 + 3u^4 - 2u^2a - 2u^3 + a^2 + 4au + 7u^2 + 3a + 14u + 5, \\
& u^7 + u^6 - u^4 + 2u^3 + 2u^2 - 1\rangle \\
I_3^u = \langle & u^7 - u^5 + 2u^3 + b - u + 1,\ u^7 - u^6 + u^5 + u^4 + 2u^3 - 3u^2 + a + 2u + 2,\ u^8 - u^6 + 3u^4 - 2u^2 + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 38 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.

$$\boldsymbol{I_1^u = \langle u^{14} - u^{13} + \cdots + b + 1,\ -u^{15} + u^{14} + \cdots + 2a - 1,\ u^{16} - 3u^{15} + \cdots - 3u + 2\rangle}$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} \frac{1}{2}u^{15} - \frac{1}{2}u^{14} + \cdots + u^4 + \frac{1}{2} \\ -u^{14} + u^{13} + \cdots + u - 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -\frac{1}{2}u^{15} + \frac{3}{2}u^{14} + \cdots - u + \frac{3}{2} \\ u^{15} - 2u^{14} + 3u^{12} + u^{11} - 7u^{10} + u^9 + 6u^8 - 7u^6 + 4u^4 - u^3 + u - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{1}{2}u^{15} - \frac{1}{2}u^{14} + \cdots + u^4 + \frac{1}{2} \\ u^{15} - 2u^{14} + 3u^{12} + u^{11} - 7u^{10} + u^9 + 6u^8 - 7u^6 + 4u^4 - u^3 + u - 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{2}u^{15} + \frac{3}{2}u^{14} + \cdots - u + \frac{3}{2} \\ u^{14} - u^{13} + \cdots + u^3 + 1 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^5 + u \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^9 + 3u^5 + u \\ u^9 - u^7 + 3u^5 - 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= 2u^{15} - 4u^{14} + 10u^{12} - 18u^{10} + 10u^9 + 24u^8 - 8u^7 - 22u^6 + 12u^5 + 20u^4 - 8u^3 - 8u^2 + 6u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{16}+2u^{15}+\cdots+7u+1$
c_2, c_3, c_5 c_6, c_7	$u^{16}+u^{14}+\cdots+u+1$
c_4, c_{10}	$u^{16}-3u^{15}+\cdots-3u+2$
c_8, c_9, c_{11} c_{12}	$u^{16}+3u^{15}+\cdots+u+4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{16} + 34y^{15} + \cdots + 3y + 1$
c_2, c_3, c_5 c_6, c_7	$y^{16} + 2y^{15} + \cdots + 7y + 1$
c_4, c_{10}	$y^{16} - 3y^{15} + \cdots - y + 4$
c_8, c_9, c_{11} c_{12}	$y^{16} + 21y^{15} + \cdots - 33y + 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.928405 + 0.260033I$ $a = 0.35481 - 2.30363I$ $b = 0.773479 - 1.013430I$	$-1.18138 - 3.90571I$	$-4.06432 + 8.02120I$
$u = 0.928405 - 0.260033I$ $a = 0.35481 + 2.30363I$ $b = 0.773479 + 1.013430I$	$-1.18138 + 3.90571I$	$-4.06432 - 8.02120I$
$u = -0.650391 + 0.833172I$ $a = -0.136050 + 0.366350I$ $b = 1.39607 - 0.78392I$	$5.41244 - 2.99211I$	$2.13069 + 2.15940I$
$u = -0.650391 - 0.833172I$ $a = -0.136050 - 0.366350I$ $b = 1.39607 + 0.78392I$	$5.41244 + 2.99211I$	$2.13069 - 2.15940I$
$u = -0.816725 + 0.248973I$ $a = 0.91106 - 1.21568I$ $b = -0.198116 - 0.632117I$	$-1.43484 + 0.76137I$	$-4.76909 - 0.41867I$
$u = -0.816725 - 0.248973I$ $a = 0.91106 + 1.21568I$ $b = -0.198116 + 0.632117I$	$-1.43484 - 0.76137I$	$-4.76909 + 0.41867I$
$u = -0.970812 + 0.659855I$ $a = -0.66898 + 2.08400I$ $b = 1.47947 + 0.97775I$	$4.31472 + 8.49137I$	$-0.41000 - 7.95274I$
$u = -0.970812 - 0.659855I$ $a = -0.66898 - 2.08400I$ $b = 1.47947 - 0.97775I$	$4.31472 - 8.49137I$	$-0.41000 + 7.95274I$
$u = 0.905631 + 0.833459I$ $a = 0.431652 + 0.930570I$ $b = -1.368560 + 0.130086I$	$4.87488 - 3.10725I$	$2.83461 + 2.27885I$
$u = 0.905631 - 0.833459I$ $a = 0.431652 - 0.930570I$ $b = -1.368560 - 0.130086I$	$4.87488 + 3.10725I$	$2.83461 - 2.27885I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.915125 + 0.963980I$ $a = -0.269698 - 0.434629I$ $b = 1.81390 + 0.76762I$	$15.6936 + 4.6465I$	$1.09085 - 1.72729I$
$u = 0.915125 - 0.963980I$ $a = -0.269698 + 0.434629I$ $b = 1.81390 - 0.76762I$	$15.6936 - 4.6465I$	$1.09085 + 1.72729I$
$u = 0.993185 + 0.916284I$ $a = -0.97982 - 1.63330I$ $b = 1.84398 - 0.79885I$	$15.4310 - 11.5459I$	$0.63569 + 6.14734I$
$u = 0.993185 - 0.916284I$ $a = -0.97982 + 1.63330I$ $b = 1.84398 + 0.79885I$	$15.4310 + 11.5459I$	$0.63569 - 6.14734I$
$u = 0.195584 + 0.595042I$ $a = 0.107025 - 0.207653I$ $b = 0.759770 + 0.417859I$	$1.30282 + 0.89270I$	$4.55158 - 1.98152I$
$u = 0.195584 - 0.595042I$ $a = 0.107025 + 0.207653I$ $b = 0.759770 - 0.417859I$	$1.30282 - 0.89270I$	$4.55158 + 1.98152I$

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

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a \\ -1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -2u^5 - 2u^4 + u^2a + u^2 - a - 4u - 2 \\ -u^2a + u^2 - 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -2u^5 - 2u^4 + 2u^2 - a - 4u - 3 \\ -u^2a + u^2 - 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2a + a - 1 \\ -u^4a - u^2 - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^6 - u^4 + 2u^2 - 1 \\ u^6 + u^5 - u^4 + 2u^2 + u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^5 + u \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^4 - u^2 + 1 \\ u^6 + u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^5 - 4u^4 + 4u^2 - 8u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{14} + 3u^{13} + \cdots + 27u + 4$
c_2, c_3, c_5 c_6, c_7	$u^{14} + u^{13} + \cdots + 5u + 2$
c_4, c_{10}	$(u^7 + u^6 - u^4 + 2u^3 + 2u^2 - 1)^2$
c_8, c_9, c_{11} c_{12}	$(u^7 + u^6 + 6u^5 + 5u^4 + 10u^3 + 6u^2 + 4u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{14} + 15y^{13} + \cdots + 95y + 16$
c_2, c_3, c_5 c_6, c_7	$y^{14} + 3y^{13} + \cdots + 27y + 4$
c_4, c_{10}	$(y^7 - y^6 + 6y^5 - 5y^4 + 10y^3 - 6y^2 + 4y - 1)^2$
c_8, c_9, c_{11} c_{12}	$(y^7 + 11y^6 + 46y^5 + 91y^4 + 86y^3 + 34y^2 + 4y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.850452 + 0.793787I$ $a = \ \ 0.529865 + 1.201600I$ $b = -1.00000$	$4.70993 - 2.92126I$	$1.79653 + 2.94858I$
$u = \ \ 0.850452 + 0.793787I$ $a = \ \ 0.368398 + 0.272687I$ $b = -1.00000$	$4.70993 - 2.92126I$	$1.79653 + 2.94858I$
$u = \ \ 0.850452 - 0.793787I$ $a = \ \ 0.529865 - 1.201600I$ $b = -1.00000$	$4.70993 + 2.92126I$	$1.79653 - 2.94858I$
$u = \ \ 0.850452 - 0.793787I$ $a = \ \ 0.368398 - 0.272687I$ $b = -1.00000$	$4.70993 + 2.92126I$	$1.79653 - 2.94858I$
$u = -0.676751 + 0.491075I$ $a = -1.041030 - 0.810129I$ $b = -1.00000$	$-2.02205 + 1.83261I$	$0.22558 - 5.43914I$
$u = -0.676751 + 0.491075I$ $a = \ \ 1.15382 - 1.90944I$ $b = -1.00000$	$-2.02205 + 1.83261I$	$0.22558 - 5.43914I$
$u = -0.676751 - 0.491075I$ $a = -1.041030 + 0.810129I$ $b = -1.00000$	$-2.02205 - 1.83261I$	$0.22558 + 5.43914I$
$u = -0.676751 - 0.491075I$ $a = \ \ 1.15382 + 1.90944I$ $b = -1.00000$	$-2.02205 - 1.83261I$	$0.22558 + 5.43914I$
$u = -0.962510 + 0.950397I$ $a = \ \ 0.498708 - 1.218380I$ $b = -1.00000$	$16.6015 + 3.4867I$	$1.97231 - 2.18600I$
$u = -0.962510 + 0.950397I$ $a = \ \ 0.487449 + 0.125376I$ $b = -1.00000$	$16.6015 + 3.4867I$	$1.97231 - 2.18600I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.962510 - 0.950397I$ $a = \quad 0.498708 + 1.218380I$ $b = -1.00000$	$16.6015 - 3.4867I$	$1.97231 + 2.18600I$
$u = -0.962510 - 0.950397I$ $a = \quad 0.487449 - 0.125376I$ $b = -1.00000$	$16.6015 - 3.4867I$	$1.97231 + 2.18600I$
$u = \quad 0.577619$ $a = -2.49721 + 3.11982I$ $b = -1.00000$	-4.03510	-9.98880
$u = \quad 0.577619$ $a = -2.49721 - 3.11982I$ $b = -1.00000$	-4.03510	-9.98880

III. $\boldsymbol{I_3^u = \langle u^7 - u^5 + 2u^3 + b - u + 1,\ u^7 - u^6 + u^5 + u^4 + 2u^3 - 3u^2 + a + 2u + 2,\ u^8 - u^6 + 3u^4 - 2u^2 + 1\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u^7 + u^6 - u^5 - u^4 - 2u^3 + 3u^2 - 2u - 2 \\ -u^7 + u^5 - 2u^3 + u - 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^6 + u^5 - u^4 + 3u^2 + 2u - 2 \\ u^7 + 2u^3 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u^7 + u^6 + u^5 - u^4 + 2u^3 + 3u^2 + 2u - 2 \\ u^7 + 2u^3 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^6 - u^5 - u^4 + 3u^2 - 2u - 2 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^7 - 2u^3 \\ -u^7 + u^5 - 2u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^5 + u \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^7 + 2u^3 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^6 - 4u^4 + 12u^2 - 12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.720342 + 0.351808I$ $a = -2.18387 - 0.72950I$ $b = -0.493156 - 0.395123I$	$-3.50087 - 1.41510I$	$-7.82674 + 4.90874I$
$u = 0.720342 - 0.351808I$ $a = -2.18387 + 0.72950I$ $b = -0.493156 + 0.395123I$	$-3.50087 + 1.41510I$	$-7.82674 - 4.90874I$
$u = -0.720342 + 0.351808I$ $a = 0.27050 - 3.18387I$ $b = -1.50684 - 0.39512I$	$-3.50087 + 1.41510I$	$-7.82674 - 4.90874I$
$u = -0.720342 - 0.351808I$ $a = 0.27050 + 3.18387I$ $b = -1.50684 + 0.39512I$	$-3.50087 - 1.41510I$	$-7.82674 + 4.90874I$
$u = 0.911292 + 0.851808I$ $a = 0.59788 + 1.68452I$ $b = -2.55249 + 0.10488I$	$3.50087 - 3.16396I$	$-4.17326 + 2.56480I$
$u = 0.911292 - 0.851808I$ $a = 0.59788 - 1.68452I$ $b = -2.55249 - 0.10488I$	$3.50087 + 3.16396I$	$-4.17326 - 2.56480I$
$u = -0.911292 + 0.851808I$ $a = -0.684515 + 0.402116I$ $b = 0.552492 + 0.104877I$	$3.50087 + 3.16396I$	$-4.17326 - 2.56480I$
$u = -0.911292 - 0.851808I$ $a = -0.684515 - 0.402116I$ $b = 0.552492 - 0.104877I$	$3.50087 - 3.16396I$	$-4.17326 + 2.56480I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^8)(u^{14}+3u^{13}+\cdots+27u+4)(u^{16}+2u^{15}+\cdots+7u+1)$
c_2, c_3, c_5 c_6, c_7	$((u^2+1)^4)(u^{14}+u^{13}+\cdots+5u+2)(u^{16}+u^{14}+\cdots+u+1)$
c_4, c_{10}	$(u^7+u^6-u^4+2u^3+2u^2-1)^2(u^8-u^6+3u^4-2u^2+1)$ $\cdot(u^{16}-3u^{15}+\cdots-3u+2)$
c_8, c_9	$(u^4-u^3+3u^2-2u+1)^2$ $\cdot((u^7+u^6+\cdots+4u+1)^2)(u^{16}+3u^{15}+\cdots+u+4)$
c_{11}, c_{12}	$(u^4+u^3+3u^2+2u+1)^2$ $\cdot((u^7+u^6+\cdots+4u+1)^2)(u^{16}+3u^{15}+\cdots+u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^8)(y^{14}+15y^{13}+\cdots+95y+16)(y^{16}+34y^{15}+\cdots+3y+1)$
c_2, c_3, c_5 c_6, c_7	$((y+1)^8)(y^{14}+3y^{13}+\cdots+27y+4)(y^{16}+2y^{15}+\cdots+7y+1)$
c_4, c_{10}	$(y^4-y^3+3y^2-2y+1)^2$ $\cdot((y^7-y^6+\cdots+4y-1)^2)(y^{16}-3y^{15}+\cdots-y+4)$
c_8, c_9, c_{11} c_{12}	$(y^4+5y^3+7y^2+2y+1)^2$ $\cdot(y^7+11y^6+46y^5+91y^4+86y^3+34y^2+4y-1)^2$ $\cdot(y^{16}+21y^{15}+\cdots-33y+16)$