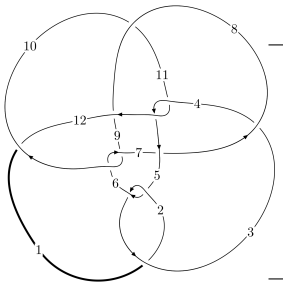
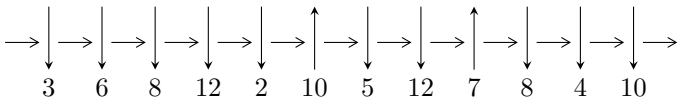
$12n_{0428}$ $(K12n_{0428})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$I_1^u = \langle 3309761832986841u^{28} - 484169443496906u^{27} + \cdots + 2728407209023967b + 10346261032522342,$
$6.12347 \times 10^{15}u^{28} - 3.65447 \times 10^{15}u^{27} + \cdots + 2.72841 \times 10^{15}a + 3.93244 \times 10^{16},\ u^{29} - u^{28} + \cdots + 11u - 1\rangle$
$I_2^u = \langle 13u^{13} + 7u^{12} + \cdots + b - 29,\ 224u^{13} + 105u^{12} + \cdots + a - 480,$
$u^{14} - 5u^{12} + u^{11} + 11u^{10} - 4u^9 - 13u^8 + 7u^7 + 8u^6 - 10u^5 - u^4 + 10u^3 - 2u^2 - 3u + 1\rangle$

* 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.

$\boldsymbol{I_1^u = \langle 3.31\times 10^{15}u^{28} - 4.84\times 10^{14}u^{27} + \cdots + 2.73\times 10^{15}b + 1.03\times 10^{16},\ 6.12\times 10^{15}u^{28} - 3.65\times 10^{15}u^{27} + \cdots + 2.73\times 10^{15}a + 3.93\times 10^{16},\ u^{29} - u^{28} + \cdots + 11u - 1\rangle}$

(i) Arc colorings

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

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

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

$$a_{10} = \begin{pmatrix} -2.24434u^{28} + 1.33942u^{27} + \cdots + 45.0118u - 14.4130 \\ -1.21307u^{28} + 0.177455u^{27} + \cdots + 17.9088u - 3.79205 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 3.72446u^{28} - 1.92791u^{27} + \cdots - 66.8278u + 18.8763 \\ 1.69382u^{28} - 0.176481u^{27} + \cdots - 18.8053u + 4.46366 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 3.69627u^{28} - 1.96435u^{27} + \cdots - 67.8684u + 19.1555 \\ 1.66563u^{28} - 0.212920u^{27} + \cdots - 19.8460u + 4.74286 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -8.80217u^{28} + 2.99230u^{27} + \cdots + 150.634u - 40.2378 \\ -5.79123u^{28} - 0.238662u^{27} + \cdots + 64.3246u - 11.6085 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -5.43646u^{28} + 2.41208u^{27} + \cdots + 107.030u - 28.7016 \\ -2.54933u^{28} - 0.164013u^{27} + \cdots + 33.7253u - 7.14216 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 2.50984u^{28} - 6.17071u^{27} + \cdots - 123.703u + 44.9330 \\ -2.45081u^{28} - 2.07795u^{27} + \cdots - 2.61459u + 7.33026 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 11.3793u^{28} - 5.86912u^{27} + \cdots - 218.129u + 62.4454 \\ 6.01027u^{28} - 0.499882u^{27} + \cdots - 76.2473u + 16.4335 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{29606274479465}{94083007207723}u^{28} - \frac{112181565603524}{94083007207723}u^{27} + \cdots - \frac{79763733552791}{94083007207723}u - \frac{508359165202078}{94083007207723}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{29}+23u^{28}+\cdots+57u+1$
c_2, c_5	$u^{29}+u^{28}+\cdots+11u+1$
c_3	$u^{29}+2u^{28}+\cdots-512u-181$
c_4, c_{11}	$u^{29}+3u^{28}+\cdots+52u+17$
c_6, c_9	$u^{29}+6u^{28}+\cdots-3u-1$
c_7	$u^{29}-3u^{28}+\cdots-343u-73$
c_8	$u^{29}+3u^{28}+\cdots-802u-61$
c_{10}	$u^{29}-2u^{28}+\cdots+306u+17$
c_{12}	$u^{29}-13u^{28}+\cdots-419u-617$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{29} - 27y^{28} + \cdots + 3781y - 1$
c_2, c_5	$y^{29} - 23y^{28} + \cdots + 57y - 1$
c_3	$y^{29} - 66y^{28} + \cdots + 773288y - 32761$
c_4, c_{11}	$y^{29} - 47y^{28} + \cdots + 3350y - 289$
c_6, c_9	$y^{29} + 30y^{28} + \cdots + 5y - 1$
c_7	$y^{29} - 9y^{28} + \cdots + 108013y - 5329$
c_8	$y^{29} - 53y^{28} + \cdots + 159352y - 3721$
c_{10}	$y^{29} - 74y^{28} + \cdots + 76942y - 289$
c_{12}	$y^{29} - 79y^{28} + \cdots - 73773123y - 380689$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.847490+0.607947I$ $a=-0.422315-0.373511I$ $b=-0.453967-0.141290I$	$1.85694+2.41024I$	$-0.38198-1.83000I$
$u=-0.847490-0.607947I$ $a=-0.422315+0.373511I$ $b=-0.453967+0.141290I$	$1.85694-2.41024I$	$-0.38198+1.83000I$
$u=\ 0.071949+0.929488I$ $a=\ 1.55015+0.37840I$ $b=-0.033988+0.404715I$	$-5.90516-1.34940I$	$-11.77988+1.16724I$
$u=\ 0.071949-0.929488I$ $a=\ 1.55015-0.37840I$ $b=-0.033988-0.404715I$	$-5.90516+1.34940I$	$-11.77988-1.16724I$
$u=\ 1.099740+0.372987I$ $a=\ 0.429259-0.314350I$ $b=-0.496131+0.172360I$	$-2.13143-3.61670I$	$-10.87499+4.53147I$
$u=\ 1.099740-0.372987I$ $a=\ 0.429259+0.314350I$ $b=-0.496131-0.172360I$	$-2.13143+3.61670I$	$-10.87499-4.53147I$
$u=-0.071629+1.166630I$ $a=-1.42014+0.38258I$ $b=\ 0.0590394-0.0700190I$	$-17.8156+5.4788I$	$-11.43005-2.27554I$
$u=-0.071629-1.166630I$ $a=-1.42014-0.38258I$ $b=\ 0.0590394+0.0700190I$	$-17.8156-5.4788I$	$-11.43005+2.27554I$
$u=-1.20779$ $a=\ 1.06012$ $b=\ 0.608535$	-5.45443	-17.0500
$u=-1.241400+0.177721I$ $a=\ 0.09350-1.46108I$ $b=-0.13368-2.49732I$	$-4.23135+3.90349I$	$-13.5060-7.1974I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.241400-0.177721I$ $a=\ \ 0.09350+1.46108I$ $b=-0.13368+2.49732I$	$-4.23135-3.90349I$	$-13.5060+7.1974I$
$u=\ \ 0.607700+0.416192I$ $a=\ \ 0.030334+0.170685I$ $b=\ \ 0.768475-0.109674I$	$-0.645013+0.114015I$	$-8.30235-0.44217I$
$u=\ \ 0.607700-0.416192I$ $a=\ \ 0.030334-0.170685I$ $b=\ \ 0.768475+0.109674I$	$-0.645013-0.114015I$	$-8.30235+0.44217I$
$u=\ \ 1.264620+0.097173I$ $a=\ \ 0.126127+0.975567I$ $b=\ \ 0.45216+2.48013I$	$-4.42915+0.22712I$	$-13.77800+0.54237I$
$u=\ \ 1.264620-0.097173I$ $a=\ \ 0.126127-0.975567I$ $b=\ \ 0.45216-2.48013I$	$-4.42915-0.22712I$	$-13.77800-0.54237I$
$u=\ \ 1.27084$ $a=-2.54450$ $b=-2.41619$	-14.6938	-21.3900
$u=-1.35314$ $a=-0.122473$ $b=\ \ 1.92297$	-15.8953	-17.3790
$u=\ \ 1.288070+0.432233I$ $a=-0.52667-1.40404I$ $b=-0.52972-2.41614I$	$-9.72617-3.55628I$	$-15.1648+2.5004I$
$u=\ \ 1.288070-0.432233I$ $a=-0.52667+1.40404I$ $b=-0.52972+2.41614I$	$-9.72617+3.55628I$	$-15.1648-2.5004I$
$u=-1.36698+0.39083I$ $a=\ \ 0.056520+1.082730I$ $b=-0.25816+2.57538I$	$-10.50180+6.08146I$	$-14.9405-3.9753I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.36698-0.39083I$ $a=\ \ 0.056520-1.082730I$ $b=-0.25816-2.57538I$	$-10.50180-6.08146I$	$-14.9405+3.9753I$
$u=\ \ 0.529556$ $a=-0.279573$ $b=\ \ 0.469661$	-0.808015	-11.9270
$u=\ \ 1.43624+0.53316I$ $a=\ \ 0.045983+1.342010I$ $b=-0.02188+2.71357I$	$16.8944-11.5066I$	$-13.6242+4.6544I$
$u=\ \ 1.43624-0.53316I$ $a=\ \ 0.045983-1.342010I$ $b=-0.02188-2.71357I$	$16.8944+11.5066I$	$-13.6242-4.6544I$
$u=-1.40063+0.62143I$ $a=\ \ 0.391966-0.973746I$ $b=\ \ 0.84600-2.06054I$	$17.5554+0.8894I$	$-13.74018-0.79352I$
$u=-1.40063-0.62143I$ $a=\ \ 0.391966+0.973746I$ $b=\ \ 0.84600+2.06054I$	$17.5554-0.8894I$	$-13.74018+0.79352I$
$u=-0.024136+0.378698I$ $a=-2.54654-0.61175I$ $b=-0.009603+0.352025I$	$-0.56395-1.71430I$	$-3.16058+4.19709I$
$u=-0.024136-0.378698I$ $a=-2.54654+0.61175I$ $b=-0.009603-0.352025I$	$-0.56395+1.71430I$	$-3.16058-4.19709I$
$u=\ \ 0.128440$ $a=-9.72992$ $b=-1.96207$	-11.0443	-5.88640

II. $I_2^u = \langle 13u^{13} + 7u^{12} + \cdots + b - 29,\ 224u^{13} + 105u^{12} + \cdots + a - 480,\ u^{14} - 5u^{12} + \cdots - 3u + 1 \rangle$

(i) Arc colorings

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

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

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

$$a_{10} = \begin{pmatrix} -224u^{13} - 105u^{12} + \cdots - 415u + 480 \\ -13u^{13} - 7u^{12} + \cdots - 29u + 29 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -143u^{13} - 67u^{12} + \cdots - 263u + 304 \\ 67u^{13} + 32u^{12} + \cdots + 129u - 145 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -189u^{13} - 89u^{12} + \cdots - 350u + 403 \\ 21u^{13} + 10u^{12} + \cdots + 42u - 46 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -143u^{13} - 67u^{12} + \cdots - 268u + 306 \\ -8u^{13} - 5u^{12} + \cdots - 25u + 21 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -98u^{13} - 46u^{12} + \cdots - 178u + 210 \\ -22u^{13} - 10u^{12} + \cdots - 35u + 44 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -130u^{13} - 63u^{12} + \cdots - 249u + 284 \\ -2u^{13} - 4u^{12} + \cdots - 20u + 12 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 62u^{13} + 30u^{12} + \cdots + 114u - 133 \\ -13u^{13} - 7u^{12} + \cdots - 35u + 31 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 254u^{13} + 120u^{12} - 1214u^{11} - 319u^{10} + 2647u^9 + 232u^8 - 3201u^7 + 272u^6 + 2171u^5 - 1523u^4 - 980u^3 + 2088u^2 + 476u - 559$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{14} - 10u^{13} + \cdots - 13u + 1$
c_2	$u^{14} - 5u^{12} + \cdots - 3u + 1$
c_3	$u^{14} + u^{13} + \cdots + 50u - 25$
c_4	$u^{14} - 2u^{13} + \cdots - 2u - 1$
c_5	$u^{14} - 5u^{12} + \cdots + 3u + 1$
c_6	$u^{14} - u^{13} + \cdots + 7u + 1$
c_7	$u^{14} + 2u^{13} + \cdots + u - 1$
c_8	$u^{14} + 4u^{13} + \cdots + 2u + 1$
c_9	$u^{14} + u^{13} + \cdots - 7u + 1$
c_{10}	$u^{14} + 15u^{13} + \cdots + 1248u + 169$
c_{11}	$u^{14} + 2u^{13} + \cdots + 2u - 1$
c_{12}	$u^{14} + 6u^{13} + \cdots + 215u + 25$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{14} - 6y^{13} + \cdots - 45y + 1$
c_2, c_5	$y^{14} - 10y^{13} + \cdots - 13y + 1$
c_3	$y^{14} - 13y^{13} + \cdots + 4600y + 625$
c_4, c_{11}	$y^{14} - 18y^{13} + \cdots + 2y + 1$
c_6, c_9	$y^{14} + 7y^{13} + \cdots - 17y + 1$
c_7	$y^{14} + 8y^{13} + \cdots + 7y + 1$
c_8	$y^{14} - 16y^{13} + \cdots - 8y + 1$
c_{10}	$y^{14} - 9y^{13} + \cdots - 67938y + 28561$
c_{12}	$y^{14} - 22y^{13} + \cdots - 5325y + 625$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.835923+0.681048I$ $a=-0.125313-0.206996I$ $b=-0.446348+0.397563I$	$1.26701+2.62945I$	$-13.2524-5.2108I$
$u=-0.835923-0.681048I$ $a=-0.125313+0.206996I$ $b=-0.446348-0.397563I$	$1.26701-2.62945I$	$-13.2524+5.2108I$
$u=\ 0.345551+0.838709I$ $a=-1.020240-0.715351I$ $b=-0.243705-0.098495I$	$-2.18681-1.21939I$	$-11.09554+1.93458I$
$u=\ 0.345551-0.838709I$ $a=-1.020240+0.715351I$ $b=-0.243705+0.098495I$	$-2.18681+1.21939I$	$-11.09554-1.93458I$
$u=-1.22266$ $a=\ 1.67303$ $b=\ 0.728923$	-13.8048	-11.3860
$u=\ 1.244710+0.138183I$ $a=-0.311608-0.937054I$ $b=\ 0.34348-2.09289I$	$-4.37404-2.52484I$	$-15.1413+2.0385I$
$u=\ 1.244710-0.138183I$ $a=-0.311608+0.937054I$ $b=\ 0.34348+2.09289I$	$-4.37404+2.52484I$	$-15.1413-2.0385I$
$u=-0.727304$ $a=\ 1.73201$ $b=\ 2.70193$	-11.7805	-17.4240
$u=\ 1.124850+0.672854I$ $a=\ 0.314703+0.747799I$ $b=\ 0.580657+1.233750I$	$-4.34890-4.36927I$	$-12.83000+4.03520I$
$u=\ 1.124850-0.672854I$ $a=\ 0.314703-0.747799I$ $b=\ 0.580657-1.233750I$	$-4.34890+4.36927I$	$-12.83000-4.03520I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.372300+0.328498I$ $a=-0.239034-1.275240I$ $b=-0.26688-2.25518I$	$-7.44862+5.20740I$	$-13.30820-4.11576I$
$u=-1.372300-0.328498I$ $a=-0.239034+1.275240I$ $b=-0.26688+2.25518I$	$-7.44862-5.20740I$	$-13.30820+4.11576I$
$u=0.468087+0.001290I$ $a=0.67897-1.74706I$ $b=-0.682627-0.104415I$	$-1.36973-1.50897I$	$-13.46764+1.98399I$
$u=0.468087-0.001290I$ $a=0.67897+1.74706I$ $b=-0.682627+0.104415I$	$-1.36973+1.50897I$	$-13.46764-1.98399I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^{14}-10u^{13}+\cdots-13u+1)(u^{29}+23u^{28}+\cdots+57u+1)$
c_2	$(u^{14}-5u^{12}+\cdots-3u+1)(u^{29}+u^{28}+\cdots+11u+1)$
c_3	$(u^{14}+u^{13}+\cdots+50u-25)(u^{29}+2u^{28}+\cdots-512u-181)$
c_4	$(u^{14}-2u^{13}+\cdots-2u-1)(u^{29}+3u^{28}+\cdots+52u+17)$
c_5	$(u^{14}-5u^{12}+\cdots+3u+1)(u^{29}+u^{28}+\cdots+11u+1)$
c_6	$(u^{14}-u^{13}+\cdots+7u+1)(u^{29}+6u^{28}+\cdots-3u-1)$
c_7	$(u^{14}+2u^{13}+\cdots+u-1)(u^{29}-3u^{28}+\cdots-343u-73)$
c_8	$(u^{14}+4u^{13}+\cdots+2u+1)(u^{29}+3u^{28}+\cdots-802u-61)$
c_9	$(u^{14}+u^{13}+\cdots-7u+1)(u^{29}+6u^{28}+\cdots-3u-1)$
c_{10}	$(u^{14}+15u^{13}+\cdots+1248u+169)(u^{29}-2u^{28}+\cdots+306u+17)$
c_{11}	$(u^{14}+2u^{13}+\cdots+2u-1)(u^{29}+3u^{28}+\cdots+52u+17)$
c_{12}	$(u^{14}+6u^{13}+\cdots+215u+25)(u^{29}-13u^{28}+\cdots-419u-617)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^{14}-6y^{13}+\cdots-45y+1)(y^{29}-27y^{28}+\cdots+3781y-1)$
c_2, c_5	$(y^{14}-10y^{13}+\cdots-13y+1)(y^{29}-23y^{28}+\cdots+57y-1)$
c_3	$(y^{14}-13y^{13}+\cdots+4600y+625)$ $\cdot(y^{29}-66y^{28}+\cdots+773288y-32761)$
c_4, c_{11}	$(y^{14}-18y^{13}+\cdots+2y+1)(y^{29}-47y^{28}+\cdots+3350y-289)$
c_6, c_9	$(y^{14}+7y^{13}+\cdots-17y+1)(y^{29}+30y^{28}+\cdots+5y-1)$
c_7	$(y^{14}+8y^{13}+\cdots+7y+1)(y^{29}-9y^{28}+\cdots+108013y-5329)$
c_8	$(y^{14}-16y^{13}+\cdots-8y+1)(y^{29}-53y^{28}+\cdots+159352y-3721)$
c_{10}	$(y^{14}-9y^{13}+\cdots-67938y+28561)$ $\cdot(y^{29}-74y^{28}+\cdots+76942y-289)$
c_{12}	$(y^{14}-22y^{13}+\cdots-5325y+625)$ $\cdot(y^{29}-79y^{28}+\cdots-73773123y-380689)$