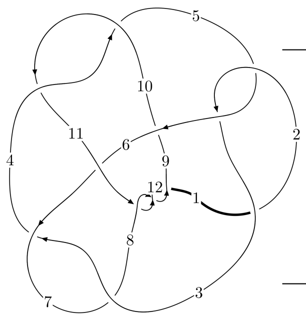
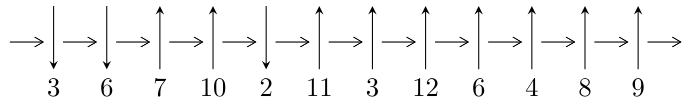
$12n_{0409}$ ($K12n_{0409}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -6.16590 \times 10^{32}u^{31} + 1.46189 \times 10^{33}u^{30} + \cdots + 1.24872 \times 10^{34}b - 5.49780 \times 10^{33},$$
$$-2.37033 \times 10^{33}u^{31} + 4.13166 \times 10^{33}u^{30} + \cdots + 1.24872 \times 10^{34}a - 1.71464 \times 10^{34},\ u^{32} - u^{31} + \cdots - 2u -$$

$$I_2^u = \langle -u^{11} + 7u^9 + u^8 - 18u^7 - 5u^6 + 21u^5 + 7u^4 - 11u^3 - 2u^2 + b + 2u,$$
$$u^{12} - 8u^{10} + 25u^8 - 40u^6 + u^5 + 36u^4 - 4u^3 - 16u^2 + a + 4u + 1,$$
$$u^{13} - 8u^{11} - u^{10} + 25u^9 + 6u^8 - 39u^7 - 12u^6 + 32u^5 + 9u^4 - 13u^3 - 2u^2 + 2u + 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 45 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.
$\boldsymbol{I_1^u = \langle -6.17\times10^{32}u^{31}+1.46\times10^{33}u^{30}+\cdots+1.25\times10^{34}b-5.50\times10^{33},\ -2.37\times10^{33}u^{31}+4.13\times10^{33}u^{30}+\cdots+1.25\times10^{34}a-1.71\times10^{34},\ u^{32}-u^{31}+\cdots-2u-1\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^2+1\\u^4-2u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}0.189821u^{31}-0.330872u^{30}+\cdots-5.59851u+1.37311\\0.0493778u^{31}-0.117071u^{30}+\cdots-1.67061u+0.440274\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0.617113u^{31}-0.702924u^{30}+\cdots-2.97277u-1.56588\\0.255210u^{31}-0.230274u^{30}+\cdots+0.144769u-0.440400\end{pmatrix}$$
$$a_4 = \begin{pmatrix}0.369799u^{31}-0.365325u^{30}+\cdots-1.90267u-0.395284\\0.0271602u^{31}-0.0677895u^{30}+\cdots-0.802345u-0.0663187\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0.361904u^{31}-0.472651u^{30}+\cdots-3.11754u-1.12548\\0.255210u^{31}-0.230274u^{30}+\cdots+0.144769u-0.440400\end{pmatrix}$$
$$a_2 = \begin{pmatrix}0.661372u^{31}-0.805565u^{30}+\cdots-5.92579u-0.0552608\\0.213423u^{31}-0.264734u^{30}+\cdots-1.41893u-0.250047\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-0.276212u^{31}+0.368159u^{30}+\cdots+2.60106u+0.644536\\-0.0127971u^{31}+0.0681599u^{30}+\cdots+0.695590u+0.0648329\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}0.209593u^{31}-0.186992u^{30}+\cdots-0.405019u+0.305269\\0.0812154u^{31}-0.0868146u^{30}+\cdots+0.236069u-0.0317778\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 2.64634u^{31}-2.11189u^{30}+\cdots+10.8149u+2.17341$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{32} + 50u^{31} + \cdots + 5873u + 169$
c_2, c_5	$u^{32} + 2u^{31} + \cdots + 149u + 13$
c_3, c_7	$u^{32} - 3u^{31} + \cdots + 6u + 13$
c_4, c_{10}	$u^{32} + u^{31} + \cdots - 12u - 7$
c_6	$u^{32} + 2u^{31} + \cdots + 2u - 11$
c_8, c_{11}, c_{12}	$u^{32} - u^{31} + \cdots - 2u - 1$
c_9	$u^{32} + 2u^{31} + \cdots + 320u - 448$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{32} - 130y^{31} + \cdots + 545386755y + 28561$
c_2, c_5	$y^{32} - 50y^{31} + \cdots - 5873y + 169$
c_3, c_7	$y^{32} + 25y^{31} + \cdots + 484y + 169$
c_4, c_{10}	$y^{32} + 47y^{31} + \cdots + 248y + 49$
c_6	$y^{32} + 4y^{31} + \cdots + 1272y + 121$
c_8, c_{11}, c_{12}	$y^{32} - 21y^{31} + \cdots - 10y + 1$
c_9	$y^{32} + 114y^{31} + \cdots - 5478400y + 200704$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.713734 + 0.634066I$ $a = -1.63454 - 0.97058I$ $b = -1.090080 + 0.559990I$	$-5.38799 + 4.75007I$	$2.65651 - 5.98480I$
$u = \ \ 0.713734 - 0.634066I$ $a = -1.63454 + 0.97058I$ $b = -1.090080 - 0.559990I$	$-5.38799 - 4.75007I$	$2.65651 + 5.98480I$
$u = -0.780100 + 0.713092I$ $a = -0.578419 + 0.988520I$ $b = -1.43666 - 0.26099I$	$-5.66767 + 1.87911I$	$1.97848 + 0.24857I$
$u = -0.780100 - 0.713092I$ $a = -0.578419 - 0.988520I$ $b = -1.43666 + 0.26099I$	$-5.66767 - 1.87911I$	$1.97848 - 0.24857I$
$u = \ \ 0.916172 + 0.567038I$ $a = \ \ 1.40079 - 1.73118I$ $b = \ \ 0.403288 + 0.064579I$	$-10.08900 + 2.24227I$	$-4.41790 - 3.08560I$
$u = \ \ 0.916172 - 0.567038I$ $a = \ \ 1.40079 + 1.73118I$ $b = \ \ 0.403288 - 0.064579I$	$-10.08900 - 2.24227I$	$-4.41790 + 3.08560I$
$u = -0.922337 + 0.681295I$ $a = -0.214448 + 0.331259I$ $b = \ \ 0.63044 - 1.91502I$	$-10.84610 - 2.63222I$	$-0.52226 + 2.78850I$
$u = -0.922337 - 0.681295I$ $a = -0.214448 - 0.331259I$ $b = \ \ 0.63044 + 1.91502I$	$-10.84610 + 2.63222I$	$-0.52226 - 2.78850I$
$u = -1.158300 + 0.287676I$ $a = -0.821536 + 1.034540I$ $b = -1.035360 - 0.657528I$	$1.13972 - 4.35971I$	$7.21820 + 7.90515I$
$u = -1.158300 - 0.287676I$ $a = -0.821536 - 1.034540I$ $b = -1.035360 + 0.657528I$	$1.13972 + 4.35971I$	$7.21820 - 7.90515I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.040580 + 0.693377I$ $a = 0.989786 - 0.571228I$ $b = 1.69133 + 0.61668I$	$-4.78339 - 7.28882I$	$3.26552 + 6.22364I$
$u = -1.040580 - 0.693377I$ $a = 0.989786 + 0.571228I$ $b = 1.69133 - 0.61668I$	$-4.78339 + 7.28882I$	$3.26552 - 6.22364I$
$u = 1.220980 + 0.289612I$ $a = -0.442917 - 0.682280I$ $b = -1.28705 + 0.65034I$	$1.13108 + 1.76995I$	$6.03589 + 2.64881I$
$u = 1.220980 - 0.289612I$ $a = -0.442917 + 0.682280I$ $b = -1.28705 - 0.65034I$	$1.13108 - 1.76995I$	$6.03589 - 2.64881I$
$u = 1.110300 + 0.663239I$ $a = 0.717757 + 0.805432I$ $b = 1.148800 + 0.137989I$	$-4.06902 + 0.32626I$	$2.59195 - 0.82777I$
$u = 1.110300 - 0.663239I$ $a = 0.717757 - 0.805432I$ $b = 1.148800 - 0.137989I$	$-4.06902 - 0.32626I$	$2.59195 + 0.82777I$
$u = 1.44139 + 0.01348I$ $a = -0.242696 + 0.203112I$ $b = -0.213818 - 0.777820I$	$3.51164 - 2.19651I$	$9.32383 + 3.81660I$
$u = 1.44139 - 0.01348I$ $a = -0.242696 - 0.203112I$ $b = -0.213818 + 0.777820I$	$3.51164 + 2.19651I$	$9.32383 - 3.81660I$
$u = 0.08148 + 1.44948I$ $a = -1.114080 - 0.266827I$ $b = -1.69713 - 0.35935I$	$-19.2923 - 4.4522I$	$1.21181 + 2.08819I$
$u = 0.08148 - 1.44948I$ $a = -1.114080 + 0.266827I$ $b = -1.69713 + 0.35935I$	$-19.2923 + 4.4522I$	$1.21181 - 2.08819I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.481966 + 0.257396I$ $a = 0.87806 + 1.29690I$ $b = 0.413129 + 0.311383I$	$-1.88542 - 1.30506I$	$1.44155 + 5.20789I$
$u = -0.481966 - 0.257396I$ $a = 0.87806 - 1.29690I$ $b = 0.413129 - 0.311383I$	$-1.88542 + 1.30506I$	$1.44155 - 5.20789I$
$u = 0.286902 + 0.362783I$ $a = 1.65914 + 1.00541I$ $b = 1.32318 - 0.60249I$	$-1.81266 + 1.48756I$	$1.92285 - 4.94836I$
$u = 0.286902 - 0.362783I$ $a = 1.65914 - 1.00541I$ $b = 1.32318 + 0.60249I$	$-1.81266 - 1.48756I$	$1.92285 + 4.94836I$
$u = -1.58012$ $a = -0.315491$ $b = -0.276511$	7.37313	22.2100
$u = 0.409982$ $a = 0.726284$ $b = -0.225298$	0.661529	15.2090
$u = 1.50304 + 0.73810I$ $a = 0.829737 + 0.686971I$ $b = 1.59659 - 0.82818I$	$-14.9102 + 12.0924I$	0
$u = 1.50304 - 0.73810I$ $a = 0.829737 - 0.686971I$ $b = 1.59659 + 0.82818I$	$-14.9102 - 12.0924I$	0
$u = -0.172476 + 0.197273I$ $a = 3.03827 - 1.51554I$ $b = 0.897886 - 0.510199I$	$-1.75865 + 1.40173I$	$0.26124 - 4.99544I$
$u = -0.172476 - 0.197273I$ $a = 3.03827 + 1.51554I$ $b = 0.897886 + 0.510199I$	$-1.75865 - 1.40173I$	$0.26124 + 4.99544I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.63318 + 0.69080I$ $a = 0.329691 - 0.659740I$ $b = 1.406370 + 0.131580I$	$-14.0115 - 3.2110I$	0
$u = -1.63318 - 0.69080I$ $a = 0.329691 + 0.659740I$ $b = 1.406370 - 0.131580I$	$-14.0115 + 3.2110I$	0

II.

$$I_2^u = \langle -u^{11}+7u^9+\cdots+b+2u,\ u^{12}-8u^{10}+\cdots+a+1,\ u^{13}-8u^{11}+\cdots+2u+1\rangle$$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

$$a_3 = \begin{pmatrix} -u^{12}+8u^{10}-25u^8+40u^6-u^5-36u^4+4u^3+16u^2-4u-1 \\ u^{11}-7u^9-u^8+18u^7+5u^6-21u^5-7u^4+11u^3+2u^2-2u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^{12}+7u^{10}+\cdots+5u-3 \\ -u^{12}+7u^{10}+\cdots+u-1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 2u^{12}-u^{11}+\cdots+u+4 \\ u^{12}-7u^{10}-u^9+19u^8+5u^7-26u^6-7u^5+19u^4+2u^3-7u^2+u+1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^9-6u^7+12u^5-10u^3+u^2+4u-2 \\ -u^{12}+7u^{10}+\cdots+u-1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^8+6u^6-12u^4+8u^2-1 \\ u^{11}-7u^9-u^8+18u^7+5u^6-21u^5-7u^4+11u^3+3u^2-2u-1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^{11}-7u^9+18u^7-20u^5+7u^3+u^2+2u-2 \\ -u^8+5u^6-8u^4+5u^2-1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 2u^{12}-u^{11}+\cdots+7u+2 \\ -u^3+2u-1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes

$= -2u^{12}-2u^{11}+16u^{10}+15u^9-47u^8-42u^7+64u^6+54u^5-46u^4-29u^3+17u^2+2u+5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{13} - 13u^{12} + \cdots + 7u - 1$
c_2	$u^{13} + 3u^{12} + \cdots - 3u - 1$
c_3	$u^{13} + 3u^{11} + \cdots + 6u - 1$
c_4	$u^{13} + 8u^{11} + 24u^9 + u^8 + 33u^7 + 4u^6 + 20u^5 + 5u^4 + 5u^3 + u^2 + 2u - 1$
c_5	$u^{13} - 3u^{12} + \cdots - 3u + 1$
c_6	$u^{13} + u^{12} - u^{11} - u^{10} - 2u^7 - 9u^6 - 2u^5 - 7u^4 - 3u^3 - 3u^2 - 1$
c_7	$u^{13} + 3u^{11} + \cdots + 6u + 1$
c_8	$u^{13} - 8u^{11} + \cdots + 2u - 1$
c_9	$u^{13} + u^{12} + \cdots - u + 1$
c_{10}	$u^{13} + 8u^{11} + 24u^9 - u^8 + 33u^7 - 4u^6 + 20u^5 - 5u^4 + 5u^3 - u^2 + 2u + 1$
c_{11}, c_{12}	$u^{13} - 8u^{11} + \cdots + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{13} - 21y^{12} + \cdots - 21y - 1$
c_2, c_5	$y^{13} - 13y^{12} + \cdots + 7y - 1$
c_3, c_7	$y^{13} + 6y^{12} + \cdots + 22y - 1$
c_4, c_{10}	$y^{13} + 16y^{12} + \cdots + 6y - 1$
c_6	$y^{13} - 3y^{12} + \cdots - 6y - 1$
c_8, c_{11}, c_{12}	$y^{13} - 16y^{12} + \cdots + 8y - 1$
c_9	$y^{13} + 23y^{12} + \cdots + 15y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.001170 + 0.552293I$ $a = 0.875628 + 0.971745I$ $b = 0.230247 - 0.841237I$	$-9.35275 - 2.09354I$	$7.20188 + 0.46928I$
$u = -1.001170 - 0.552293I$ $a = 0.875628 - 0.971745I$ $b = 0.230247 + 0.841237I$	$-9.35275 + 2.09354I$	$7.20188 - 0.46928I$
$u = 1.229660 + 0.182594I$ $a = -0.338886 - 0.829343I$ $b = -1.11117 + 1.04233I$	$0.99221 + 2.74184I$	$3.93696 - 4.65266I$
$u = 1.229660 - 0.182594I$ $a = -0.338886 + 0.829343I$ $b = -1.11117 - 1.04233I$	$0.99221 - 2.74184I$	$3.93696 + 4.65266I$
$u = -1.298440 + 0.119369I$ $a = -0.766018 + 1.016630I$ $b = -1.227350 - 0.566412I$	$-1.21383 - 4.55409I$	$3.28508 + 3.98345I$
$u = -1.298440 - 0.119369I$ $a = -0.766018 - 1.016630I$ $b = -1.227350 + 0.566412I$	$-1.21383 + 4.55409I$	$3.28508 - 3.98345I$
$u = 0.572766 + 0.333551I$ $a = 0.953439 + 0.550346I$ $b = 1.031350 + 0.503157I$	$-1.38489 - 0.74935I$	$5.96891 - 3.49027I$
$u = 0.572766 - 0.333551I$ $a = 0.953439 - 0.550346I$ $b = 1.031350 - 0.503157I$	$-1.38489 + 0.74935I$	$5.96891 + 3.49027I$
$u = -0.294410 + 0.263773I$ $a = 1.38207 - 3.00576I$ $b = 0.992614 - 0.156850I$	$-4.69980 + 3.16875I$	$5.12846 - 3.30315I$
$u = -0.294410 - 0.263773I$ $a = 1.38207 + 3.00576I$ $b = 0.992614 + 0.156850I$	$-4.69980 - 3.16875I$	$5.12846 + 3.30315I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.60888 + 0.07753I$ $a = -0.048946 - 0.541592I$ $b = -0.616598 + 0.097202I$	$2.26514 - 1.76839I$	$2.54626 + 1.07577I$
$u = 1.60888 - 0.07753I$ $a = -0.048946 + 0.541592I$ $b = -0.616598 - 0.097202I$	$2.26514 + 1.76839I$	$2.54626 - 1.07577I$
$u = -1.63455$ $a = -0.114567$ $b = -0.598176$	7.04862	-3.13510

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^{13} - 13u^{12} + \cdots + 7u - 1)(u^{32} + 50u^{31} + \cdots + 5873u + 169)$
c_2	$(u^{13} + 3u^{12} + \cdots - 3u - 1)(u^{32} + 2u^{31} + \cdots + 149u + 13)$
c_3	$(u^{13} + 3u^{11} + \cdots + 6u - 1)(u^{32} - 3u^{31} + \cdots + 6u + 13)$
c_4	$(u^{13} + 8u^{11} + 24u^9 + u^8 + 33u^7 + 4u^6 + 20u^5 + 5u^4 + 5u^3 + u^2 + 2u - 1)$ $\cdot (u^{32} + u^{31} + \cdots - 12u - 7)$
c_5	$(u^{13} - 3u^{12} + \cdots - 3u + 1)(u^{32} + 2u^{31} + \cdots + 149u + 13)$
c_6	$(u^{13} + u^{12} - u^{11} - u^{10} - 2u^7 - 9u^6 - 2u^5 - 7u^4 - 3u^3 - 3u^2 - 1)$ $\cdot (u^{32} + 2u^{31} + \cdots + 2u - 11)$
c_7	$(u^{13} + 3u^{11} + \cdots + 6u + 1)(u^{32} - 3u^{31} + \cdots + 6u + 13)$
c_8	$(u^{13} - 8u^{11} + \cdots + 2u - 1)(u^{32} - u^{31} + \cdots - 2u - 1)$
c_9	$(u^{13} + u^{12} + \cdots - u + 1)(u^{32} + 2u^{31} + \cdots + 320u - 448)$
c_{10}	$(u^{13} + 8u^{11} + 24u^9 - u^8 + 33u^7 - 4u^6 + 20u^5 - 5u^4 + 5u^3 - u^2 + 2u + 1)$ $\cdot (u^{32} + u^{31} + \cdots - 12u - 7)$
c_{11}, c_{12}	$(u^{13} - 8u^{11} + \cdots + 2u + 1)(u^{32} - u^{31} + \cdots - 2u - 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^{13} - 21y^{12} + \cdots - 21y - 1)$ $\cdot (y^{32} - 130y^{31} + \cdots + 545386755y + 28561)$
c_2, c_5	$(y^{13} - 13y^{12} + \cdots + 7y - 1)(y^{32} - 50y^{31} + \cdots - 5873y + 169)$
c_3, c_7	$(y^{13} + 6y^{12} + \cdots + 22y - 1)(y^{32} + 25y^{31} + \cdots + 484y + 169)$
c_4, c_{10}	$(y^{13} + 16y^{12} + \cdots + 6y - 1)(y^{32} + 47y^{31} + \cdots + 248y + 49)$
c_6	$(y^{13} - 3y^{12} + \cdots - 6y - 1)(y^{32} + 4y^{31} + \cdots + 1272y + 121)$
c_8, c_{11}, c_{12}	$(y^{13} - 16y^{12} + \cdots + 8y - 1)(y^{32} - 21y^{31} + \cdots - 10y + 1)$
c_9	$(y^{13} + 23y^{12} + \cdots + 15y - 1)$ $\cdot (y^{32} + 114y^{31} + \cdots - 5478400y + 200704)$