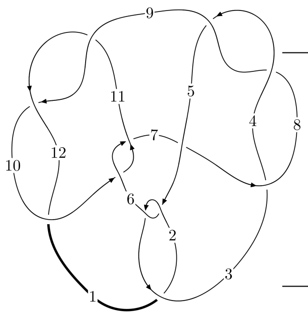
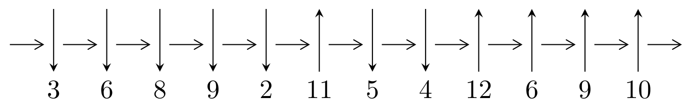
$12n_{0346}$ $(K12n_{0346})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &-8563315867395u^{19} + 12169590007513u^{18} + \cdots + 130824317761068b + 64802000815324,\\
&52899877847623u^{19} - 79722292100065u^{18} + \cdots + 130824317761068a - 413103210378158,\\
&u^{20} - 2u^{19} + \cdots - 12u + 4\rangle\\
I_2^u = \langle &u^7 - u^6 - 2u^5 + 3u^4 - 2u^2 + b + 4u - 2,\ -u^7 - u^6 + 3u^5 + 2u^4 - 3u^3 + a - 2,\\
&u^8 + u^7 - 3u^6 - 2u^5 + 3u^4 + 2u - 1\rangle\\
I_3^u = \langle &-au + b - u - 1,\ 2a^2 + au - 1,\ u^2 - 2\rangle
\end{aligned}$$

$$I_1^v = \langle a,\ b - v + 2,\ v^2 - 3v + 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 34 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. $I^u_1 = \langle -8.56\times 10^{12}u^{19} + 1.22\times 10^{13}u^{18} + \cdots + 1.31\times 10^{13}b + 6.48\times 10^{13},\ 5.29\times 10^{13}u^{19} - 7.97\times 10^{13}u^{18} + \cdots + 1.31\times 10^{13}a - 4.13\times 10^{14},\ u^{20} - 2u^{19} + \cdots - 12u + 4\rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^2+1\\u^4-2u^2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u^3+2u\\-u^3+u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-4.04358u^{19} + 6.09384u^{18} + \cdots - 25.5560u + 31.5769\\0.654566u^{19} - 0.930224u^{18} + \cdots + 6.84847u - 4.95336\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-4.04358u^{19} + 6.09384u^{18} + \cdots - 25.5560u + 31.5769\\-0.367222u^{19} + 0.611916u^{18} + \cdots - 0.897037u + 3.01992\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-6.21544u^{19} + 9.28273u^{18} + \cdots - 48.2193u + 51.0252\\0.348398u^{19} - 0.661202u^{18} + \cdots + 3.63448u - 3.80249\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-4.90774u^{19} + 7.58167u^{18} + \cdots - 38.9378u + 42.2351\\2.23801u^{19} - 3.26288u^{18} + \cdots + 16.4563u - 17.7254\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-5.35239u^{19} + 8.30016u^{18} + \cdots - 43.5388u + 45.8952\\2.16712u^{19} - 3.30945u^{18} + \cdots + 15.7609u - 18.5509\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}5.60383u^{19} - 8.48450u^{18} + \cdots + 48.3882u - 47.1067\\-2.25347u^{19} + 3.54770u^{18} + \cdots - 15.9192u + 19.1670\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{8651471282093}{3270607940267}u^{19} - \frac{12603254258761}{3270607940267}u^{18} + \cdots - \frac{78299168927818}{3270607940267}u - \frac{83998088848016}{3270607940267}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{20} + 24u^{18} + \cdots + 3807u + 81$
c_2, c_5	$u^{20} + 4u^{19} + \cdots - 93u - 9$
c_3, c_4, c_8	$u^{20} + 2u^{19} + \cdots + 12u + 4$
c_6, c_{10}	$u^{20} + 2u^{19} + \cdots + 3200u + 256$
c_7	$u^{20} - 6u^{19} + \cdots - 6212u - 964$
c_9, c_{11}, c_{12}	$u^{20} + 12u^{19} + \cdots - 58u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{20} + 48y^{19} + \cdots - 10684791y + 6561$
c_2, c_5	$y^{20} + 24y^{18} + \cdots - 3807y + 81$
c_3, c_4, c_8	$y^{20} - 14y^{19} + \cdots - 432y + 16$
c_6, c_{10}	$y^{20} - 60y^{19} + \cdots - 5160960y + 65536$
c_7	$y^{20} + 58y^{19} + \cdots - 44905072y + 929296$
c_9, c_{11}, c_{12}	$y^{20} - 44y^{19} + \cdots - 2922y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.311540 + 0.820503I$ $a = -1.183960 + 0.104977I$ $b = -0.936205 - 0.261735I$	$1.94026 - 0.82547I$	$0.912486 + 0.761117I$
$u = -0.311540 - 0.820503I$ $a = -1.183960 - 0.104977I$ $b = -0.936205 + 0.261735I$	$1.94026 + 0.82547I$	$0.912486 - 0.761117I$
$u = 0.806269 + 0.099052I$ $a = -0.029427 - 0.611307I$ $b = 0.383913 - 0.245700I$	$-1.290640 + 0.060456I$	$-5.65835 + 0.55419I$
$u = 0.806269 - 0.099052I$ $a = -0.029427 + 0.611307I$ $b = 0.383913 + 0.245700I$	$-1.290640 - 0.060456I$	$-5.65835 - 0.55419I$
$u = 1.33638$ $a = -1.16154$ $b = 1.16836$	3.62783	3.71420
$u = -1.301610 + 0.401831I$ $a = 0.508418 - 0.295516I$ $b = -0.439577 + 0.851076I$	$-1.51005 + 5.52302I$	$-5.54282 - 3.24717I$
$u = -1.301610 - 0.401831I$ $a = 0.508418 + 0.295516I$ $b = -0.439577 - 0.851076I$	$-1.51005 - 5.52302I$	$-5.54282 + 3.24717I$
$u = 1.037800 + 0.883330I$ $a = 0.77758 - 1.27910I$ $b = -2.72069 - 2.90147I$	$4.14315 - 3.36874I$	$0.04800 + 2.58345I$
$u = 1.037800 - 0.883330I$ $a = 0.77758 + 1.27910I$ $b = -2.72069 + 2.90147I$	$4.14315 + 3.36874I$	$0.04800 - 2.58345I$
$u = -1.38998$ $a = -0.0133698$ $b = -1.23390$	-6.53389	-14.0580

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.307583 + 1.370650I$ $a = 0.05460 + 1.81689I$ $b = -1.41200 + 5.33955I$	$-16.9450 + 5.1999I$	$0.48479 - 2.11695I$
$u = -0.307583 - 1.370650I$ $a = 0.05460 - 1.81689I$ $b = -1.41200 - 5.33955I$	$-16.9450 - 5.1999I$	$0.48479 + 2.11695I$
$u = 1.43456$ $a = 0.671677$ $b = 7.72000$	-4.98064	60.9990
$u = 0.486279$ $a = -3.47218$ $b = 1.37914$	6.88313	-9.17840
$u = 0.388073$ $a = 0.457271$ $b = 0.718784$	-1.01688	-12.8430
$u = 1.58364 + 0.49918I$ $a = -1.064100 + 0.688577I$ $b = 3.34498 + 2.38478I$	$16.4234 - 11.7755I$	$-1.93237 + 4.54638I$
$u = 1.58364 - 0.49918I$ $a = -1.064100 - 0.688577I$ $b = 3.34498 - 2.38478I$	$16.4234 + 11.7755I$	$-1.93237 - 4.54638I$
$u = -0.283054$ $a = -3.06452$ $b = -0.370034$	1.22670	10.7000
$u = -1.49310 + 0.84801I$ $a = 1.22823 + 0.86872I$ $b = -3.91160 + 3.62679I$	$19.0199 + 2.7480I$	$-0.478669 - 0.983748I$
$u = -1.49310 - 0.84801I$ $a = 1.22823 - 0.86872I$ $b = -3.91160 - 3.62679I$	$19.0199 - 2.7480I$	$-0.478669 + 0.983748I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^7 - 9u^6 - 10u^5 + 27u^4 - 2u^3 - 18u^2 + 20u - 17$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.180120 + 0.268597I$ $a = 0.805639 - 0.183365I$ $b = -1.14297 - 0.89911I$	$0.604279 - 1.131230I$	$-1.38132 + 1.25921I$
$u = 1.180120 - 0.268597I$ $a = 0.805639 + 0.183365I$ $b = -1.14297 + 0.89911I$	$0.604279 + 1.131230I$	$-1.38132 - 1.25921I$
$u = 0.108090 + 0.747508I$ $a = 0.189481 - 1.310380I$ $b = -0.02521 - 1.55019I$	$3.80435 - 2.57849I$	$1.74277 + 4.63100I$
$u = 0.108090 - 0.747508I$ $a = 0.189481 + 1.310380I$ $b = -0.02521 + 1.55019I$	$3.80435 + 2.57849I$	$1.74277 - 4.63100I$
$u = -1.37100$ $a = -0.729394$ $b = 6.70204$	-4.85780	-25.4550
$u = -1.334530 + 0.318930I$ $a = -0.708845 - 0.169402I$ $b = 1.07471 - 1.15185I$	$-0.73474 + 6.44354I$	$-1.71699 - 7.87618I$
$u = -1.334530 - 0.318930I$ $a = -0.708845 + 0.169402I$ $b = 1.07471 + 1.15185I$	$-0.73474 - 6.44354I$	$-1.71699 + 7.87618I$
$u = 0.463640$ $a = 2.15684$ $b = 0.484913$	0.799899	-10.8330

III. $I_3^u = \langle -au + b - u - 1,\ 2a^2 + au - 1,\ u^2 - 2 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.41421$ $a = -1.14412$ $b = 0.796180$	2.30291	−4.00000
$u = 1.41421$ $a = 0.437016$ $b = 3.03225$	−5.59278	−4.00000
$u = -1.41421$ $a = 1.14412$ $b = -2.03225$	2.30291	−4.00000
$u = -1.41421$ $a = -0.437016$ $b = 0.203820$	−5.59278	−4.00000

IV. $I_1^v = \langle a,\ b - v + 2,\ v^2 - 3v + 1\rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

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

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

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

$$a_7 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ v - 2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -2v + 1 \\ v - 2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -2v + 1 \\ 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 2v \\ -1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 2v - 1 \\ -1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} v \\ -1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 14$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 0.381966$ $a = 0$ $b = -1.61803$	-0.657974	14.0000
$v = 2.61803$ $a = 0$ $b = 0.618034$	7.23771	14.0000

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u-1)^6(u^8-3u^7+7u^6-10u^5+11u^4-10u^3+6u^2-4u+1)$ $\cdot(u^{20}+24u^{18}+\cdots+3807u+81)$
c_2	$(u-1)^2(u+1)^4(u^8-u^7-u^6+2u^5+u^4-2u^3+2u-1)$ $\cdot(u^{20}+4u^{19}+\cdots-93u-9)$
c_3, c_4	$u^2(u^2-2)^2(u^8+u^7-3u^6-2u^5+3u^4+2u-1)$ $\cdot(u^{20}+2u^{19}+\cdots+12u+4)$
c_5	$(u-1)^4(u+1)^2(u^8+u^7-u^6-2u^5+u^4+2u^3-2u-1)$ $\cdot(u^{20}+4u^{19}+\cdots-93u-9)$
c_6	$u^8(u^2-u-1)(u^2+u-1)^2(u^{20}+2u^{19}+\cdots+3200u+256)$
c_7	$u^2(u^2-2)^2(u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1)$ $\cdot(u^{20}-6u^{19}+\cdots-6212u-964)$
c_8	$u^2(u^2-2)^2(u^8-u^7-3u^6+2u^5+3u^4-2u-1)$ $\cdot(u^{20}+2u^{19}+\cdots+12u+4)$
c_9	$((u+1)^8)(u^2-u-1)^3(u^{20}+12u^{19}+\cdots-58u+1)$
c_{10}	$u^8(u^2-u-1)^2(u^2+u-1)(u^{20}+2u^{19}+\cdots+3200u+256)$
c_{11}, c_{12}	$((u-1)^8)(u^2+u-1)^3(u^{20}+12u^{19}+\cdots-58u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y-1)^6(y^8+5y^7+11y^6+6y^5-17y^4-34y^3-22y^2-4y+1)$ $\cdot(y^{20}+48y^{19}+\cdots-10684791y+6561)$
c_2, c_5	$(y-1)^6(y^8-3y^7+7y^6-10y^5+11y^4-10y^3+6y^2-4y+1)$ $\cdot(y^{20}+24y^{18}+\cdots-3807y+81)$
c_3, c_4, c_8	$y^2(y-2)^4(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)$ $\cdot(y^{20}-14y^{19}+\cdots-432y+16)$
c_6, c_{10}	$y^8(y^2-3y+1)^3(y^{20}-60y^{19}+\cdots-5160960y+65536)$
c_7	$y^2(y-2)^4(y^8+5y^7+11y^6+6y^5-17y^4-34y^3-22y^2-4y+1)$ $\cdot(y^{20}+58y^{19}+\cdots-44905072y+929296)$
c_9, c_{11}, c_{12}	$((y-1)^8)(y^2-3y+1)^3(y^{20}-44y^{19}+\cdots-2922y+1)$