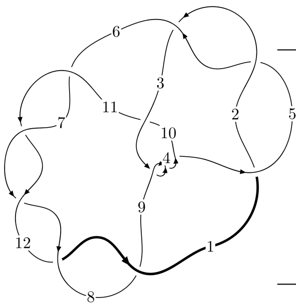
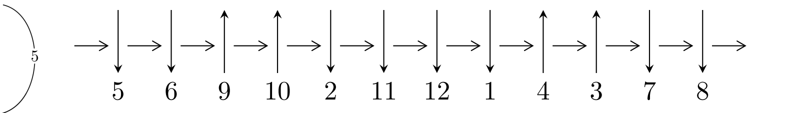
$12a_{1233}$ ($K12a_{1233}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & 55915836184337u^{43} + 64179161931292u^{42} + \cdots + 453025782144423b + 117930377236025, \\
& -212034836392771u^{43} - 365740891628043u^{42} + \cdots + 90605156428846a - 1349574182090028, \\
& u^{44} + 2u^{43} + \cdots + 10u + 1\rangle \\
I_2^u = \langle & b+1,\ a,\ u^2+u-1\rangle \\
I_3^u = \langle & b-1,\ a^2+2u-4,\ u^2-u-1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 50 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. $\boldsymbol{I_1^u = \langle 5.59 \times 10^{13} u^{43} + 6.42 \times 10^{13} u^{42} + \cdots + 4.53 \times 10^{13} b + 1.18 \times 10^{14},\ -2.12 \times 10^{14} u^{43} - 3.66 \times 10^{14} u^{42} + \cdots + 9.06 \times 10^{13} a - 1.35 \times 10^{15},\ u^{44} + 2u^{43} + \cdots + 10u + 1 \rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 2.34021u^{43} + 4.03665u^{42} + \cdots + 34.7587u + 14.8951 \\ -1.23427u^{43} - 1.41668u^{42} + \cdots - 12.4742u - 2.60317 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1.10593u^{43} + 2.61997u^{42} + \cdots + 22.2845u + 12.2919 \\ -1.23427u^{43} - 1.41668u^{42} + \cdots - 12.4742u - 2.60317 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1.85429u^{43} + 3.86193u^{42} + \cdots + 41.9220u + 15.2508 \\ -0.560033u^{43} - 0.357346u^{42} + \cdots + 0.835350u - 0.740724 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^3 - 2u \\ u^5 - 3u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 2.83815u^{43} + 5.23204u^{42} + \cdots + 53.7766u + 20.3839 \\ -0.609358u^{43} - 0.379534u^{42} + \cdots - 8.15167u - 2.41432 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -1.91530u^{43} - 3.28109u^{42} + \cdots - 28.9627u - 12.6975 \\ 0.723413u^{43} + 1.18474u^{42} + \cdots + 12.5122u + 2.70679 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^4 - 3u^2 + 1 \\ u^6 - 4u^4 + 3u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{18072105995455}{45302578214423} u^{43} - \frac{25950739447177}{45302578214423} u^{42} + \cdots - \frac{71920607974749}{45302578214423} u + \frac{76480599133623}{45302578214423}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_5	$u^{44} + 3u^{43} + \cdots - 11u - 1$
c_3, c_4, c_9	$u^{44} - u^{43} + \cdots + 4u + 4$
c_6, c_7, c_8 c_{11}, c_{12}	$u^{44} - 2u^{43} + \cdots - 10u + 1$
c_{10}	$u^{44} + 3u^{43} + \cdots - 540u - 68$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$y^{44} - 45y^{43} + \cdots - 251y + 1$
c_3, c_4, c_9	$y^{44} - 39y^{43} + \cdots - 176y + 16$
c_6, c_7, c_8 c_{11}, c_{12}	$y^{44} - 60y^{43} + \cdots - 66y + 1$
c_{10}	$y^{44} + 21y^{43} + \cdots - 261680y + 4624$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.998544 + 0.111218I$ $a = 0.351759 - 0.614033I$ $b = -0.801508 + 0.547302I$	$-0.663058 - 0.817762I$	$-8.32759 + 0.71545I$
$u = 0.998544 - 0.111218I$ $a = 0.351759 + 0.614033I$ $b = -0.801508 - 0.547302I$	$-0.663058 + 0.817762I$	$-8.32759 - 0.71545I$
$u = -1.001850 + 0.127057I$ $a = 0.120314 + 0.945722I$ $b = 0.516618 - 0.643752I$	$-3.83529 + 2.20768I$	$-11.83990 - 4.73522I$
$u = -1.001850 - 0.127057I$ $a = 0.120314 - 0.945722I$ $b = 0.516618 + 0.643752I$	$-3.83529 - 2.20768I$	$-11.83990 + 4.73522I$
$u = -0.954649$ $a = -2.19836$ $b = -1.29146$	0.461481	-10.4800
$u = 1.009480 + 0.273056I$ $a = -0.335081 + 1.217640I$ $b = -0.390450 - 0.804941I$	$0.61880 - 5.62694I$	$-5.80251 + 6.42762I$
$u = 1.009480 - 0.273056I$ $a = -0.335081 - 1.217640I$ $b = -0.390450 + 0.804941I$	$0.61880 + 5.62694I$	$-5.80251 - 6.42762I$
$u = 1.065250 + 0.397438I$ $a = 0.04875 - 1.63500I$ $b = 1.49141 + 0.28927I$	$-5.49263 - 9.59429I$	$-8.85592 + 6.59284I$
$u = 1.065250 - 0.397438I$ $a = 0.04875 + 1.63500I$ $b = 1.49141 - 0.28927I$	$-5.49263 + 9.59429I$	$-8.85592 - 6.59284I$
$u = -1.131940 + 0.326750I$ $a = -0.162725 - 1.267720I$ $b = -1.50777 + 0.18978I$	$-10.46760 + 5.17349I$	$-13.11043 - 4.56372I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.131940 - 0.326750I$ $a = -0.162725 + 1.267720I$ $b = -1.50777 - 0.18978I$	$-10.46760 - 5.17349I$	$-13.11043 + 4.56372I$
$u = 1.193530 + 0.183455I$ $a = 0.388564 - 0.688390I$ $b = 1.47060 + 0.06865I$	$-7.96364 - 0.55193I$	$-10.90446 + 0.I$
$u = 1.193530 - 0.183455I$ $a = 0.388564 + 0.688390I$ $b = 1.47060 - 0.06865I$	$-7.96364 + 0.55193I$	$-10.90446 + 0.I$
$u = -0.534767 + 0.564063I$ $a = -1.168730 + 0.715602I$ $b = 1.42904 + 0.11240I$	$-2.23516 - 1.94324I$	$-7.08189 - 0.05666I$
$u = -0.534767 - 0.564063I$ $a = -1.168730 - 0.715602I$ $b = 1.42904 - 0.11240I$	$-2.23516 + 1.94324I$	$-7.08189 + 0.05666I$
$u = 0.767069$ $a = -0.450820$ $b = -0.373478$	-1.47485	-4.57540
$u = 0.374316 + 0.607175I$ $a = 1.31959 + 1.13185I$ $b = -1.43997 - 0.06548I$	$-5.73016 - 1.98434I$	$-10.23333 + 3.59268I$
$u = 0.374316 - 0.607175I$ $a = 1.31959 - 1.13185I$ $b = -1.43997 + 0.06548I$	$-5.73016 + 1.98434I$	$-10.23333 - 3.59268I$
$u = -0.257658 + 0.663265I$ $a = -1.53428 + 1.37125I$ $b = 1.44829 - 0.20795I$	$-1.39014 + 5.99441I$	$-5.18773 - 5.53945I$
$u = -0.257658 - 0.663265I$ $a = -1.53428 - 1.37125I$ $b = 1.44829 + 0.20795I$	$-1.39014 - 5.99441I$	$-5.18773 + 5.53945I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.475748 + 0.282175I$ $a = 1.74537 + 0.58249I$ $b = -0.390691 - 0.314994I$	$3.52033 - 0.22404I$	$-1.41771 - 1.59086I$
$u = -0.475748 - 0.282175I$ $a = 1.74537 - 0.58249I$ $b = -0.390691 + 0.314994I$	$3.52033 + 0.22404I$	$-1.41771 + 1.59086I$
$u = -0.209850 + 0.494994I$ $a = 0.58968 - 2.01314I$ $b = -0.337217 + 0.618314I$	$4.39585 + 3.01078I$	$0.72066 - 6.01437I$
$u = -0.209850 - 0.494994I$ $a = 0.58968 + 2.01314I$ $b = -0.337217 - 0.618314I$	$4.39585 - 3.01078I$	$0.72066 + 6.01437I$
$u = 1.50823$ $a = -0.100172$ $b = 1.32001$	-8.29422	0
$u = -0.387467$ $a = 0.781408$ $b = 1.09644$	-2.22865	3.06750
$u = 1.62350$ $a = 0.906030$ $b = 0.0651186$	-3.95658	0
$u = -1.64624$ $a = -0.216085$ $b = -0.708554$	-9.99566	0
$u = 0.189239 + 0.289124I$ $a = -0.78500 - 1.22940I$ $b = 0.260740 + 0.297980I$	$-0.172531 - 0.795475I$	$-4.76256 + 8.61865I$
$u = 0.189239 - 0.289124I$ $a = -0.78500 + 1.22940I$ $b = 0.260740 - 0.297980I$	$-0.172531 + 0.795475I$	$-4.76256 - 8.61865I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.72050$ $a = -1.48319$ $b = -1.43451$	-9.17931	0
$u = -1.72348 + 0.02231I$ $a = 0.015179 + 0.587021I$ $b = -0.834304 - 0.720855I$	$-10.41810 + 1.32296I$	0
$u = -1.72348 - 0.02231I$ $a = 0.015179 - 0.587021I$ $b = -0.834304 + 0.720855I$	$-10.41810 - 1.32296I$	0
$u = -1.72606 + 0.06803I$ $a = -0.285786 - 0.879713I$ $b = -0.421727 + 0.935386I$	$-9.13626 + 6.99467I$	0
$u = -1.72606 - 0.06803I$ $a = -0.285786 + 0.879713I$ $b = -0.421727 - 0.935386I$	$-9.13626 - 6.99467I$	0
$u = 1.72925 + 0.02883I$ $a = 0.161648 - 0.753573I$ $b = 0.595671 + 0.841277I$	$-13.66280 - 2.81563I$	0
$u = 1.72925 - 0.02883I$ $a = 0.161648 + 0.753573I$ $b = 0.595671 - 0.841277I$	$-13.66280 + 2.81563I$	0
$u = -1.74076 + 0.10823I$ $a = 0.423301 + 1.179640I$ $b = 1.52903 - 0.35516I$	$-15.4403 + 11.7022I$	0
$u = -1.74076 - 0.10823I$ $a = 0.423301 - 1.179640I$ $b = 1.52903 + 0.35516I$	$-15.4403 - 11.7022I$	0
$u = 1.75924 + 0.08406I$ $a = -0.481703 + 0.904253I$ $b = -1.57902 - 0.27351I$	$18.6454 - 6.9174I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.75924 - 0.08406I$ $a = -0.481703 - 0.904253I$ $b = -1.57902 + 0.27351I$	$18.6454 + 6.9174I$	0
$u = -1.76489 + 0.04721I$ $a = 0.643456 + 0.550041I$ $b = 1.58894 - 0.15433I$	$-18.6224 + 1.5527I$	0
$u = -1.76489 - 0.04721I$ $a = 0.643456 - 0.550041I$ $b = 1.58894 + 0.15433I$	$-18.6224 - 1.5527I$	0
$u = -0.134595$ $a = 9.65258$ $b = -0.928944$	3.24469	2.21600

II. $I_2^u = \langle b+1,\ a,\ u^2+u-1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -18$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^2$
c_3, c_4, c_9 c_{10}	u^2
c_5	$(u+1)^2$
c_6, c_7, c_8	u^2+u-1
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_9 c_{10}	y^2
c_6, c_7, c_8 c_{11}, c_{12}	$y^2 - 3y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.618034$ $a = 0$ $b = -1.00000$	-2.63189	-18.0000
$u = -1.61803$ $a = 0$ $b = -1.00000$	-10.5276	-18.0000

III. $I_3^u = \langle b-1,\ a^2+2u-4,\ u^2-u-1\rangle$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} 1 \\ u+1 \end{pmatrix}$$

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

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

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

$$a_2 = \begin{pmatrix} a+1 \\ 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -a \\ -1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -2u+2 \\ -au+u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} a \\ -au-a+1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -8$

(iv) u-Polynomials at the component

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

(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_9 c_{10}	$(y-2)^4$
c_6, c_7, c_8 c_{11}, c_{12}	$(y^2-3y+1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.618034$ $a = 2.28825$ $b = 1.00000$	2.30291	-8.00000
$u = -0.618034$ $a = -2.28825$ $b = 1.00000$	2.30291	-8.00000
$u = 1.61803$ $a = -0.874032$ $b = 1.00000$	-5.59278	-8.00000
$u = 1.61803$ $a = 0.874032$ $b = 1.00000$	-5.59278	-8.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^2)(u+1)^4(u^{44}+3u^{43}+\cdots-11u-1)$
c_3, c_4, c_9	$u^2(u^2-2)^2(u^{44}-u^{43}+\cdots+4u+4)$
c_5	$((u-1)^4)(u+1)^2(u^{44}+3u^{43}+\cdots-11u-1)$
c_6, c_7, c_8	$((u^2-u-1)^2)(u^2+u-1)(u^{44}-2u^{43}+\cdots-10u+1)$
c_{10}	$u^2(u^2-2)^2(u^{44}+3u^{43}+\cdots-540u-68)$
c_{11}, c_{12}	$(u^2-u-1)(u^2+u-1)^2(u^{44}-2u^{43}+\cdots-10u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5	$((y-1)^6)(y^{44} - 45y^{43} + \cdots - 251y + 1)$
c_3, c_4, c_9	$y^2(y-2)^4(y^{44} - 39y^{43} + \cdots - 176y + 16)$
c_6, c_7, c_8 c_{11}, c_{12}	$((y^2 - 3y + 1)^3)(y^{44} - 60y^{43} + \cdots - 66y + 1)$
c_{10}	$y^2(y-2)^4(y^{44} + 21y^{43} + \cdots - 261680y + 4624)$