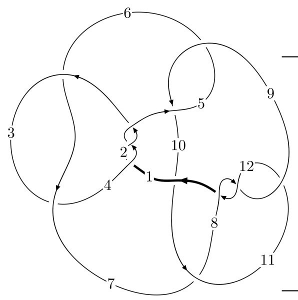
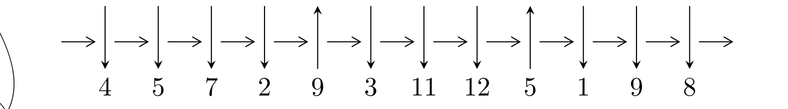
$12n_{0677}$ ($K12n_{0677}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &84729282499200u^{49} + 3758065856672058u^{48} + \cdots + 68529224613008296 - 6852284696559709, \\
&- 6.85291 \times 10^{15}u^{49} + 2.05586 \times 10^{16}u^{48} + \cdots + 1.37058 \times 10^{16}a + 9.44180 \times 10^{16}, \\
&u^{50} - 3u^{49} + \cdots - 14u + 1\rangle \\
I_2^u = \langle &2au + u^2 + b + u + 1,\ -u^2a + a^2 - u^2 - a - u - 2,\ u^3 + u^2 + 2u + 1\rangle
\end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 56 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. $\boldsymbol{I_1^u = \langle 8.47 \times 10^{13} u^{49} + 3.76 \times 10^{15} u^{48} + \cdots + 6.85 \times 10^{15} b - 6.85 \times 10^{15},\ -6.85 \times 10^{15} u^{49} + 2.06 \times 10^{16} u^{48} + \cdots + 1.37 \times 10^{16} a + 9.44 \times 10^{16},\ u^{50} - 3u^{49} + \cdots - 14u + 1 \rangle}$

(i) Arc colorings

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

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

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

$$a_8 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 0.499999u^{49} - 1.49999u^{48} + \cdots + 15.0256u - 6.88889 \\ -0.0123640u^{49} - 0.548389u^{48} + \cdots - 3.33203u + 0.999907 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^3 + 2u \\ u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.666682u^{49} - 2.00117u^{48} + \cdots + 26.2921u - 7.92593 \\ -0.00103128u^{49} + 0.120354u^{48} + \cdots - 2.70359u + 0.833325 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.333328u^{49} + 0.999541u^{48} + \cdots + 1.63220u + 3.29630 \\ -0.0354893u^{49} + 1.92137u^{48} + \cdots - 2.80779u - 0.167168 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.333328u^{49} + 0.999541u^{48} + \cdots + 1.63220u + 3.29630 \\ -0.00783089u^{49} + 0.919108u^{48} + \cdots - 2.48066u - 0.166726 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.166654u^{49} - 0.499067u^{48} + \cdots + 15.7612u - 4.48148 \\ 0.00329781u^{49} + 0.613395u^{48} + \cdots + 0.629281u + 0.333358 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^6 - 3u^4 - 2u^2 + 1 \\ -u^8 - 4u^6 - 4u^4 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$$= \frac{5330467839288029}{6852922461300829} u^{49} - \frac{25189087260468945}{13705844922601658} u^{48} + \cdots + \frac{266207119693174765}{13705844922601658} u - \frac{140924841106764001}{13705844922601658}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{50} - 4u^{49} + \cdots + 11u + 1$
c_3, c_6	$u^{50} + 4u^{49} + \cdots - u + 1$
c_5, c_9	$u^{50} - 3u^{49} + \cdots + 32u + 64$
c_7	$u^{50} + 3u^{49} + \cdots - 12700u + 977$
c_8, c_{11}, c_{12}	$u^{50} - 3u^{49} + \cdots - 14u + 1$
c_{10}	$u^{50} - 9u^{49} + \cdots + 13688u + 209$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{50} - 40y^{49} + \cdots - 19y + 1$
c_3, c_6	$y^{50} - 12y^{49} + \cdots - 19y + 1$
c_5, c_9	$y^{50} - 35y^{49} + \cdots - 82944y + 4096$
c_7	$y^{50} + 11y^{49} + \cdots - 129195550y + 954529$
c_8, c_{11}, c_{12}	$y^{50} + 47y^{49} + \cdots - 150y + 1$
c_{10}	$y^{50} + 31y^{49} + \cdots - 210039934y + 43681$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.552389 + 0.742281I$ $a = 0.58850 + 1.59488I$ $b = -0.405792 + 0.376362I$	$0.54313 + 5.94487I$	$-9.08850 - 3.35912I$
$u = 0.552389 - 0.742281I$ $a = 0.58850 - 1.59488I$ $b = -0.405792 - 0.376362I$	$0.54313 - 5.94487I$	$-9.08850 + 3.35912I$
$u = -0.922692$ $a = -1.08212$ $b = -0.943183$	-5.06588	-21.9910
$u = -0.749534 + 0.478843I$ $a = 0.202016 - 0.272595I$ $b = 0.365555 - 0.028774I$	$-4.15396 + 2.45065I$	$-18.0240 - 7.7083I$
$u = -0.749534 - 0.478843I$ $a = 0.202016 + 0.272595I$ $b = 0.365555 + 0.028774I$	$-4.15396 - 2.45065I$	$-18.0240 + 7.7083I$
$u = 0.790702 + 0.343009I$ $a = 1.63606 + 1.17395I$ $b = 1.55555 + 0.92027I$	$-0.76132 - 10.59360I$	$-11.03214 + 7.66029I$
$u = 0.790702 - 0.343009I$ $a = 1.63606 - 1.17395I$ $b = 1.55555 - 0.92027I$	$-0.76132 + 10.59360I$	$-11.03214 - 7.66029I$
$u = 0.702274 + 0.393042I$ $a = -1.31621 - 1.35430I$ $b = -1.36162 - 0.89962I$	$3.75899 - 5.49083I$	$-7.01323 + 5.78466I$
$u = 0.702274 - 0.393042I$ $a = -1.31621 + 1.35430I$ $b = -1.36162 + 0.89962I$	$3.75899 + 5.49083I$	$-7.01323 - 5.78466I$
$u = 0.566166 + 0.558111I$ $a = -0.90619 - 1.55455I$ $b = -0.020776 - 0.271583I$	$4.38215 + 1.22744I$	$-5.15353 + 0.43980I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.566166 - 0.558111I$ $a = -0.90619 + 1.55455I$ $b = -0.020776 + 0.271583I$	$4.38215 - 1.22744I$	$-5.15353 - 0.43980I$
$u = -0.120712 + 1.229850I$ $a = 1.45598 + 0.19323I$ $b = 0.507473 - 0.965365I$	$0.54799 + 1.96970I$	0
$u = -0.120712 - 1.229850I$ $a = 1.45598 - 0.19323I$ $b = 0.507473 + 0.965365I$	$0.54799 - 1.96970I$	0
$u = -0.457079 + 1.168010I$ $a = 0.722675 + 0.578522I$ $b = 0.755050 - 0.558234I$	$-1.48101 + 4.89320I$	0
$u = -0.457079 - 1.168010I$ $a = 0.722675 - 0.578522I$ $b = 0.755050 + 0.558234I$	$-1.48101 - 4.89320I$	0
$u = 0.623208 + 0.370284I$ $a = 1.11093 + 1.42613I$ $b = 0.450819 + 0.112665I$	$0.00046 - 3.40676I$	$-9.23836 + 4.55497I$
$u = 0.623208 - 0.370284I$ $a = 1.11093 - 1.42613I$ $b = 0.450819 - 0.112665I$	$0.00046 + 3.40676I$	$-9.23836 - 4.55497I$
$u = -0.024870 + 1.281810I$ $a = 0.558643 - 0.077771I$ $b = -0.47247 - 2.22216I$	$2.27889 + 0.01971I$	0
$u = -0.024870 - 1.281810I$ $a = 0.558643 + 0.077771I$ $b = -0.47247 + 2.22216I$	$2.27889 - 0.01971I$	0
$u = -0.239006 + 1.260440I$ $a = -0.861709 - 0.739108I$ $b = -1.15757 + 1.31290I$	$2.34625 + 3.21609I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.239006 - 1.260440I$ $a = -0.861709 + 0.739108I$ $b = -1.15757 - 1.31290I$	$2.34625 - 3.21609I$	0
$u = 0.149426 + 1.300560I$ $a = 0.0642609 - 0.0722773I$ $b = 1.63464 + 2.09669I$	$-5.69465 - 2.27909I$	0
$u = 0.149426 - 1.300560I$ $a = 0.0642609 + 0.0722773I$ $b = 1.63464 - 2.09669I$	$-5.69465 + 2.27909I$	0
$u = 0.535241 + 0.419966I$ $a = 0.82919 + 1.50246I$ $b = 1.147110 + 0.719409I$	$0.319873 - 0.282575I$	$-8.47740 + 2.84929I$
$u = 0.535241 - 0.419966I$ $a = 0.82919 - 1.50246I$ $b = 1.147110 - 0.719409I$	$0.319873 + 0.282575I$	$-8.47740 - 2.84929I$
$u = -0.203499 + 1.334990I$ $a = -2.06609 + 0.25372I$ $b = -0.87123 + 3.23217I$	$1.75099 + 3.13920I$	0
$u = -0.203499 - 1.334990I$ $a = -2.06609 - 0.25372I$ $b = -0.87123 - 3.23217I$	$1.75099 - 3.13920I$	0
$u = -0.646196$ $a = 1.77141$ $b = 1.30808$	-1.56699	-3.89440
$u = -0.16539 + 1.41406I$ $a = -0.381243 + 0.117701I$ $b = 0.345250 - 0.188328I$	$4.73635 + 3.24367I$	0
$u = -0.16539 - 1.41406I$ $a = -0.381243 - 0.117701I$ $b = 0.345250 + 0.188328I$	$4.73635 - 3.24367I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.545177+0.098559I$ $a=-0.20103-4.61567I$ $b=-0.12303-2.25640I$	$-2.79473+0.42156I$	$-9.5718+13.6793I$
$u=-0.545177-0.098559I$ $a=-0.20103+4.61567I$ $b=-0.12303+2.25640I$	$-2.79473-0.42156I$	$-9.5718-13.6793I$
$u=\ \ 0.20588+1.44689I$ $a=-0.759687-0.164512I$ $b=-1.97063-2.49195I$	$6.28981-3.04185I$	0
$u=\ \ 0.20588-1.44689I$ $a=-0.759687+0.164512I$ $b=-1.97063+2.49195I$	$6.28981+3.04185I$	0
$u=\ \ 0.23659+1.44426I$ $a=-0.896231-0.085608I$ $b=-1.88095-0.27769I$	$5.83118-6.56630I$	0
$u=\ \ 0.23659-1.44426I$ $a=-0.896231+0.085608I$ $b=-1.88095+0.27769I$	$5.83118+6.56630I$	0
$u=\ \ 0.26311+1.46153I$ $a=\ \ 1.048660-0.063993I$ $b=\ \ 2.20151+2.19868I$	$9.72958-9.01297I$	0
$u=\ \ 0.26311-1.46153I$ $a=\ \ 1.048660+0.063993I$ $b=\ \ 2.20151-2.19868I$	$9.72958+9.01297I$	0
$u=\ \ 0.30795+1.45297I$ $a=-1.163440+0.334790I$ $b=-2.26238-1.86908I$	$4.9961-14.5819I$	0
$u=\ \ 0.30795-1.45297I$ $a=-1.163440-0.334790I$ $b=-2.26238+1.86908I$	$4.9961+14.5819I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.17767 + 1.48810I$ $a = 0.910279 + 0.279030I$ $b = 1.58884 + 0.42973I$	$11.00730 - 1.41798I$	0
$u = 0.17767 - 1.48810I$ $a = 0.910279 - 0.279030I$ $b = 1.58884 - 0.42973I$	$11.00730 + 1.41798I$	0
$u = -0.28006 + 1.47904I$ $a = -0.234853 + 0.002148I$ $b = -0.706929 + 0.767521I$	$2.11187 + 6.21835I$	0
$u = -0.28006 - 1.47904I$ $a = -0.234853 - 0.002148I$ $b = -0.706929 - 0.767521I$	$2.11187 - 6.21835I$	0
$u = -0.424070 + 0.252385I$ $a = 0.469708 - 0.951492I$ $b = -0.347645 - 0.564793I$	$-0.662266 + 1.036830I$	$-7.92072 - 6.52809I$
$u = -0.424070 - 0.252385I$ $a = 0.469708 + 0.951492I$ $b = -0.347645 + 0.564793I$	$-0.662266 - 1.036830I$	$-7.92072 + 6.52809I$
$u = 0.489012$ $a = -0.158233$ $b = -1.61950$	-9.76798	6.36650
$u = 0.09636 + 1.51933I$ $a = -0.818964 - 0.431147I$ $b = -1.187120 - 0.592577I$	$8.07849 + 3.95049I$	0
$u = 0.09636 - 1.51933I$ $a = -0.818964 + 0.431147I$ $b = -1.187120 + 0.592577I$	$8.07849 - 3.95049I$	0
$u = 0.0847567$ $a = -5.51357$ $b = 0.687292$	-1.09557	-8.51770

II. $\boldsymbol{I_2^u = \langle 2au + u^2 + b + u + 1,\ -u^2a + a^2 - u^2 - a - u - 2,\ u^3 + u^2 + 2u + 1\rangle}$

(i) Arc colorings

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

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

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

$$a_8 = \begin{pmatrix} u \\ -u^2 - u - 1 \end{pmatrix}$$

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

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

$$a_7 = \begin{pmatrix} -u^2 - 1 \\ -u^2 - u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^2 + 1 \\ -au \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ au + 2u^2 + 2u + 2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0 \\ au + 2u^2 + 2u + 2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} a \\ 2u^2 + 2u + 2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^2a - 3au - 9u^2 - 7u - 28$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = -1.071720 - 0.909787I$ $b = -1.96201 + 1.66556I$	$2.03717 + 2.82812I$	$-11.98231 + 5.87116I$
$u = -0.215080 + 1.307140I$ $a = \quad 0.409360 + 0.347508I$ $b = \quad 1.96201 - 1.66556I$	$-5.85852 + 2.82812I$	$-11.36167 - 7.89410I$
$u = -0.215080 - 1.307140I$ $a = -1.071720 + 0.909787I$ $b = -1.96201 - 1.66556I$	$2.03717 - 2.82812I$	$-11.98231 - 5.87116I$
$u = -0.215080 - 1.307140I$ $a = \quad 0.409360 - 0.347508I$ $b = \quad 1.96201 + 1.66556I$	$-5.85852 - 2.82812I$	$-11.36167 + 7.89410I$
$u = -0.569840$ $a = -0.818721$ $b = -1.68796$	-9.99610	-29.1310
$u = -0.569840$ $a = \quad 2.14344$ $b = \quad 1.68796$	-2.10041	-21.1810

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u^2+u-1)^3)(u^{50}-4u^{49}+\cdots+11u+1)$
c_3	$((u^2+u-1)^3)(u^{50}+4u^{49}+\cdots-u+1)$
c_4	$((u^2-u-1)^3)(u^{50}-4u^{49}+\cdots+11u+1)$
c_5, c_9	$u^6(u^{50}-3u^{49}+\cdots+32u+64)$
c_6	$((u^2-u-1)^3)(u^{50}+4u^{49}+\cdots-u+1)$
c_7	$((u^3+u^2-1)^2)(u^{50}+3u^{49}+\cdots-12700u+977)$
c_8	$((u^3-u^2+2u-1)^2)(u^{50}-3u^{49}+\cdots-14u+1)$
c_{10}	$((u^3+u^2-1)^2)(u^{50}-9u^{49}+\cdots+13688u+209)$
c_{11}, c_{12}	$((u^3+u^2+2u+1)^2)(u^{50}-3u^{49}+\cdots-14u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y^2-3y+1)^3)(y^{50}-40y^{49}+\cdots-19y+1)$
c_3, c_6	$((y^2-3y+1)^3)(y^{50}-12y^{49}+\cdots-19y+1)$
c_5, c_9	$y^6(y^{50}-35y^{49}+\cdots-82944y+4096)$
c_7	$((y^3-y^2+2y-1)^2)(y^{50}+11y^{49}+\cdots-1.29196\times 10^8 y+954529)$
c_8, c_{11}, c_{12}	$((y^3+3y^2+2y-1)^2)(y^{50}+47y^{49}+\cdots-150y+1)$
c_{10}	$((y^3-y^2+2y-1)^2)(y^{50}+31y^{49}+\cdots-2.10040\times 10^8 y+43681)$