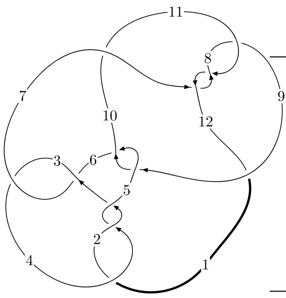
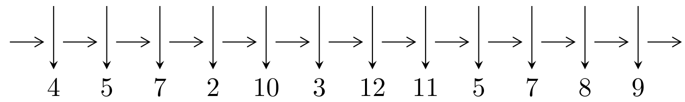
$12n_{0680}$ ($K12n_{0680}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I^u_1 &= \langle 3449u^{20} + 3669u^{19} + \cdots + 71498b - 42457,\ -23077u^{20} - 82531u^{19} + \cdots + 71498a + 43556,\\
&\quad u^{21} + 4u^{20} + \cdots - 2u + 1\rangle\\
I^u_2 &= \langle b,\ u^5 + 2u^4 + 4u^3 + 4u^2 + a + 3u + 2,\ u^6 + u^5 + 3u^4 + 2u^3 + 2u^2 + u - 1\rangle\\
I^u_3 &= \langle -au + b - u,\ -u^2a + a^2 + au - 3u^2 + 2u - 4,\ u^3 - u^2 + 2u - 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 33 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. $\boldsymbol{I_1^u = \langle 3449u^{20} + 3669u^{19} + \cdots + 71498b - 42457,\ -23077u^{20} - 82531u^{19} + \cdots + 71498a + 43556,\ u^{21} + 4u^{20} + \cdots - 2u + 1\rangle}$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.322764u^{20} + 1.15431u^{19} + \cdots + 4.24348u - 0.609192 \\ -0.0482391u^{20} - 0.0513161u^{19} + \cdots - 0.0347422u + 0.593821 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 0.274525u^{20} + 1.10300u^{19} + \cdots + 4.20873u - 0.0153711 \\ -0.0482391u^{20} - 0.0513161u^{19} + \cdots - 0.0347422u + 0.593821 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.224552u^{20} - 1.13479u^{19} + \cdots - 2.45920u + 0.935718 \\ 0.166117u^{20} + 0.596254u^{19} + \cdots + 0.165739u - 0.324387 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^5 - 2u^3 - u \\ -u^7 - 3u^5 - 2u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^3 + 2u \\ u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.406179u^{20} - 1.57648u^{19} + \cdots - 2.97737u + 0.847101 \\ -0.0482391u^{20} - 0.0513161u^{19} + \cdots - 0.0347422u - 0.406179 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.0868835u^{20} + 0.255951u^{19} + \cdots + 1.16347u + 0.290428 \\ 0.0482391u^{20} + 0.0513161u^{19} + \cdots + 0.0347422u + 0.406179 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{58626}{35749}u^{20} - \frac{459843}{71498}u^{19} + \cdots + \frac{105825}{71498}u - \frac{777975}{71498}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{21} - 10u^{20} + \cdots - 4u - 1$
c_3, c_6	$u^{21} + 4u^{20} + \cdots - 128u + 64$
c_5, c_9	$u^{21} - 2u^{20} + \cdots + 224u + 64$
c_7, c_8, c_{11}	$u^{21} - 4u^{20} + \cdots - 2u - 1$
c_{10}, c_{12}	$u^{21} + 4u^{20} + \cdots - 304u - 97$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{21} - 4y^{20} + \cdots + 152y - 1$
c_3, c_6	$y^{21} + 30y^{20} + \cdots + 90112y - 4096$
c_5, c_9	$y^{21} + 28y^{20} + \cdots + 82944y - 4096$
c_7, c_8, c_{11}	$y^{21} + 22y^{20} + \cdots - 10y - 1$
c_{10}, c_{12}	$y^{21} + 14y^{20} + \cdots - 131266y - 9409$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.904622 + 0.417722I$ $a = 1.45274 - 0.01148I$ $b = 0.92182 - 2.09929I$	$6.05963 + 7.34750I$	$-14.4555 - 4.2838I$
$u = -0.904622 - 0.417722I$ $a = 1.45274 + 0.01148I$ $b = 0.92182 + 2.09929I$	$6.05963 - 7.34750I$	$-14.4555 + 4.2838I$
$u = -0.766571 + 0.752408I$ $a = -1.037380 + 0.144450I$ $b = 0.29405 + 2.35369I$	$7.09375 - 1.76941I$	$-12.87851 - 0.26190I$
$u = -0.766571 - 0.752408I$ $a = -1.037380 - 0.144450I$ $b = 0.29405 - 2.35369I$	$7.09375 + 1.76941I$	$-12.87851 + 0.26190I$
$u = 0.182461 + 1.208850I$ $a = -0.276557 - 0.201585I$ $b = -0.119527 + 0.423528I$	$2.74625 - 2.07596I$	$-5.86030 + 3.17371I$
$u = 0.182461 - 1.208850I$ $a = -0.276557 + 0.201585I$ $b = -0.119527 - 0.423528I$	$2.74625 + 2.07596I$	$-5.86030 - 3.17371I$
$u = -0.734798$ $a = -1.01042$ $b = -1.32151$	-10.5256	-25.3380
$u = 0.200947 + 1.339400I$ $a = -1.31937 + 2.00455I$ $b = -0.552581 - 0.279603I$	$1.78822 - 2.54403I$	$-24.8123 + 5.5170I$
$u = 0.200947 - 1.339400I$ $a = -1.31937 - 2.00455I$ $b = -0.552581 + 0.279603I$	$1.78822 + 2.54403I$	$-24.8123 - 5.5170I$
$u = -0.341638 + 1.336290I$ $a = 0.828590 - 0.644391I$ $b = -1.256020 - 0.461833I$	$-6.25683 + 3.88389I$	$-16.6815 - 2.9719I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.341638 - 1.336290I$ $a = 0.828590 + 0.644391I$ $b = -1.256020 + 0.461833I$	$-6.25683 - 3.88389I$	$-16.6815 + 2.9719I$
$u = 0.512237$ $a = -5.60059$ $b = -0.289328$	-2.52473	-76.9450
$u = -0.35905 + 1.50519I$ $a = 0.78634 + 2.07126I$ $b = 1.39494 - 1.98909I$	$12.2217 + 11.9532I$	$-11.90704 - 5.00504I$
$u = -0.35905 - 1.50519I$ $a = 0.78634 - 2.07126I$ $b = 1.39494 + 1.98909I$	$12.2217 - 11.9532I$	$-11.90704 + 5.00504I$
$u = 0.06735 + 1.55292I$ $a = -1.37220 + 0.85690I$ $b = 1.86679 - 0.98776I$	$5.79361 - 0.73866I$	$-10.20116 + 0.28003I$
$u = 0.06735 - 1.55292I$ $a = -1.37220 - 0.85690I$ $b = 1.86679 + 0.98776I$	$5.79361 + 0.73866I$	$-10.20116 - 0.28003I$
$u = -0.21280 + 1.64374I$ $a = -0.63755 - 2.25205I$ $b = -0.62112 + 3.12830I$	$15.1889 + 1.8962I$	$-10.30157 - 0.70895I$
$u = -0.21280 - 1.64374I$ $a = -0.63755 + 2.25205I$ $b = -0.62112 - 3.12830I$	$15.1889 - 1.8962I$	$-10.30157 + 0.70895I$
$u = 0.334401$ $a = -0.860564$ $b = 0.297521$	-0.669543	-14.6190
$u = 0.077997 + 0.278544I$ $a = -0.18883 + 1.76255I$ $b = 0.728300 - 0.059767I$	$-0.764279 + 0.134030I$	$-11.95123 + 0.33972I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.077997 - 0.278544I$		
$a = -0.18883 - 1.76255I$	$-0.764279 - 0.134030I$	$-11.95123 - 0.33972I$
$b = 0.728300 + 0.059767I$		

II.

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

(i) Arc colorings

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^5-2u^4-4u^3-4u^2-3u-2 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -u^5-2u^4-4u^3-4u^2-3u-2 \\ 0 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} u \\ u^3+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^2+1 \\ u^4+2u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^5-2u^3-u \\ -u^5-u^4-2u^3-u^2-u+1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^3+2u \\ u^3+u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^5+2u^3+u \\ u^5+u^4+2u^3+u^2+u-1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -2u^5-2u^4-6u^3-4u^2-4u-2 \\ -u^5-u^4-2u^3-u^2-u+1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= u^5-u^4+5u^3+4u^2+7u-7$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^6$
c_3, c_6	y^6
c_5, c_9, c_{10} c_{12}	$y^6 - 7y^5 + 17y^4 - 16y^3 + 6y^2 - 5y + 1$
c_7, c_8, c_{11}	$y^6 + 5y^5 + 9y^4 + 4y^3 - 6y^2 - 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.873214$ $a = -0.422181$ $b = 0$	-9.30502	-14.4810
$u = 0.138835 + 1.234450I$ $a = 0.26610 + 1.72116I$ $b = 0$	$1.31531 - 1.97241I$	$-15.7816 + 4.5012I$
$u = 0.138835 - 1.234450I$ $a = 0.26610 - 1.72116I$ $b = 0$	$1.31531 + 1.97241I$	$-15.7816 - 4.5012I$
$u = -0.408802 + 1.276380I$ $a = -0.417699 - 0.090629I$ $b = 0$	$-5.34051 + 4.59213I$	$-11.43321 - 5.39767I$
$u = -0.408802 - 1.276380I$ $a = -0.417699 + 0.090629I$ $b = 0$	$-5.34051 - 4.59213I$	$-11.43321 + 5.39767I$
$u = 0.413150$ $a = -4.27462$ $b = 0$	-2.38379	-3.08970

III. $\boldsymbol{I_3^u = \langle -au + b - u,\ -u^2a + a^2 + au - 3u^2 + 2u - 4,\ u^3 - u^2 + 2u - 1 \rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3u^2a - 5u^2 + 3a + 7u - 15$

(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_8	$(u^3 - u^2 + 2u - 1)^2$
c_{10}, c_{12}	$(u^3 - u^2 + 1)^2$
c_{11}	$(u^3 + u^2 + 2u + 1)^2$

(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_8, c_{11}	$(y^3 + 3y^2 + 2y - 1)^2$
c_{10}, c_{12}	$(y^3 - y^2 + 2y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.215080 + 1.307140I$ $a = -1.075750 + 0.460350I$ $b = -0.618034$	$2.03717 - 2.82812I$	$-12.9982 + 11.8301I$
$u = 0.215080 + 1.307140I$ $a = -0.80169 - 1.20521I$ $b = 1.61803$	$-5.85852 - 2.82812I$	$-13.61882 - 1.93520I$
$u = 0.215080 - 1.307140I$ $a = -1.075750 - 0.460350I$ $b = -0.618034$	$2.03717 + 2.82812I$	$-12.9982 - 11.8301I$
$u = 0.215080 - 1.307140I$ $a = -0.80169 + 1.20521I$ $b = 1.61803$	$-5.85852 + 2.82812I$	$-13.61882 + 1.93520I$
$u = 0.569840$ $a = 1.83945$ $b = 1.61803$	-9.99610	-8.90830
$u = 0.569840$ $a = -2.08457$ $b = -0.618034$	-2.10041	-16.8580

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u-1)^6)(u^2+u-1)^3(u^{21}-10u^{20}+\cdots-4u-1)$
c_3	$u^6(u^2+u-1)^3(u^{21}+4u^{20}+\cdots-128u+64)$
c_4	$((u+1)^6)(u^2-u-1)^3(u^{21}-10u^{20}+\cdots-4u-1)$
c_5	$u^6(u^6-u^5+\cdots+u-1)(u^{21}-2u^{20}+\cdots+224u+64)$
c_6	$u^6(u^2-u-1)^3(u^{21}+4u^{20}+\cdots-128u+64)$
c_7, c_8	$(u^3-u^2+2u-1)^2(u^6+u^5+3u^4+2u^3+2u^2+u-1)$ $\cdot\,(u^{21}-4u^{20}+\cdots-2u-1)$
c_9	$u^6(u^6+u^5+\cdots-u-1)(u^{21}-2u^{20}+\cdots+224u+64)$
c_{10}, c_{12}	$(u^3-u^2+1)^2(u^6+u^5-3u^4-2u^3+2u^2-u-1)$ $\cdot\,(u^{21}+4u^{20}+\cdots-304u-97)$
c_{11}	$(u^3+u^2+2u+1)^2(u^6-u^5+3u^4-2u^3+2u^2-u-1)$ $\cdot\,(u^{21}-4u^{20}+\cdots-2u-1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y-1)^6)(y^2-3y+1)^3(y^{21}-4y^{20}+\cdots+152y-1)$
c_3, c_6	$y^6(y^2-3y+1)^3(y^{21}+30y^{20}+\cdots+90112y-4096)$
c_5, c_9	$y^6(y^6-7y^5+17y^4-16y^3+6y^2-5y+1)$ $\cdot(y^{21}+28y^{20}+\cdots+82944y-4096)$
c_7, c_8, c_{11}	$(y^3+3y^2+2y-1)^2(y^6+5y^5+9y^4+4y^3-6y^2-5y+1)$ $\cdot(y^{21}+22y^{20}+\cdots-10y-1)$
c_{10}, c_{12}	$(y^3-y^2+2y-1)^2(y^6-7y^5+17y^4-16y^3+6y^2-5y+1)$ $\cdot(y^{21}+14y^{20}+\cdots-131266y-9409)$