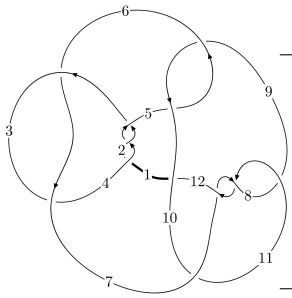
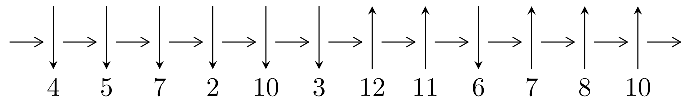
$12n_{0678}$ ($K12n_{0678}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &-171832171743933u^{44} + 565195223234702u^{43} + \cdots + 319912709247818b - 45090425568559,\\
&221527977237717u^{44} - 489493690784658u^{43} + \cdots + 319912709247818a + 1085130159951208,\\
&u^{45} - 3u^{44} + \cdots - 8u + 1\rangle\\
I_2^u = \langle &-au + b - u,\ u^2a + a^2 + au - u^2 + 4a,\ u^3 + u^2 + 2u + 1\rangle
\end{aligned}$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 51 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.

$\boldsymbol{I_1^u = \langle -1.72\times 10^{14}u^{44}+5.65\times 10^{14}u^{43}+\cdots+3.20\times 10^{14}b-4.51\times 10^{13},\ 2.22\times 10^{14}u^{44}-4.89\times 10^{14}u^{43}+\cdots+3.20\times 10^{14}a+1.09\times 10^{15},\ u^{45}-3u^{44}+\cdots-8u+1\rangle}$

(i) Arc colorings

$$a_7 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-0.692464u^{44}+1.53009u^{43}+\cdots-21.6689u-3.39196\\0.537122u^{44}-1.76672u^{43}+\cdots+4.08754u+0.140946\end{pmatrix}$$
$$a_8 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-0.155342u^{44}-0.236632u^{43}+\cdots-17.5814u-3.25101\\0.537122u^{44}-1.76672u^{43}+\cdots+4.08754u+0.140946\end{pmatrix}$$
$$a_6 = \begin{pmatrix}1.72119u^{44}-3.14555u^{43}+\cdots+18.4989u+1.81534\\-2.01801u^{44}+5.92336u^{43}+\cdots-15.5848u+1.72119\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-u\\u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u^3-2u\\u^3+u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^7+4u^5+4u^3\\-u^7-3u^5-2u^3+u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-0.470191u^{44}+1.87005u^{43}+\cdots+7.18359u+3.39261\\-0.462878u^{44}+1.23328u^{43}+\cdots-3.91246u+0.140946\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-1.21496u^{44}+3.02326u^{43}+\cdots-22.9486u-0.0362322\\0.462878u^{44}-1.23328u^{43}+\cdots+3.91246u-0.140946\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u^2+1\\-u^4-2u^2\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{124420232195109}{159956354623909}u^{44}+\frac{585183168556345}{319912709247818}u^{43}+\cdots-\frac{61646602641489 67}{319912709247818}u-\frac{3111644555281919}{319912709247818}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_4	$u^{45} - 4u^{44} + \cdots + 3u - 1$
c_3, c_6	$u^{45} + 4u^{44} + \cdots - u + 1$
c_5, c_9	$u^{45} + 3u^{44} + \cdots + 160u + 64$
c_7, c_8, c_{11}	$u^{45} + 3u^{44} + \cdots - 8u - 1$
c_{10}	$u^{45} - 3u^{44} + \cdots - 542u - 97$
c_{12}	$u^{45} + 19u^{44} + \cdots + 653792u - 13633$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$y^{45} - 34y^{44} + \cdots + 5y - 1$
c_3, c_6	$y^{45} - 6y^{44} + \cdots + 5y - 1$
c_5, c_9	$y^{45} + 35y^{44} + \cdots + 58368y - 4096$
c_7, c_8, c_{11}	$y^{45} + 37y^{44} + \cdots + 120y - 1$
c_{10}	$y^{45} - 39y^{44} + \cdots + 1081792y - 9409$
c_{12}	$y^{45} - 59y^{44} + \cdots + 530299074808y - 185858689$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.583612 + 0.749370I$ $a = -0.145378 - 1.180080I$ $b = 0.314212 + 0.693704I$	$-0.22746 - 3.52607I$	$-0.53223 + 9.05892I$
$u = -0.583612 - 0.749370I$ $a = -0.145378 + 1.180080I$ $b = 0.314212 - 0.693704I$	$-0.22746 + 3.52607I$	$-0.53223 - 9.05892I$
$u = 0.884188 + 0.167276I$ $a = -1.44217 + 3.00622I$ $b = 1.01437 - 1.10209I$	$4.46171 + 9.77082I$	$-1.55814 - 6.22355I$
$u = 0.884188 - 0.167276I$ $a = -1.44217 - 3.00622I$ $b = 1.01437 + 1.10209I$	$4.46171 - 9.77082I$	$-1.55814 + 6.22355I$
$u = -0.862556 + 0.189586I$ $a = -0.10994 + 1.47934I$ $b = -0.099189 - 0.621407I$	$1.49082 - 1.15898I$	$5.48142 + 4.79165I$
$u = -0.862556 - 0.189586I$ $a = -0.10994 - 1.47934I$ $b = -0.099189 + 0.621407I$	$1.49082 + 1.15898I$	$5.48142 - 4.79165I$
$u = 0.879134 + 0.073302I$ $a = 1.69262 - 2.92394I$ $b = -1.05605 + 1.10417I$	$8.52509 + 4.00354I$	$1.85103 - 2.75584I$
$u = 0.879134 - 0.073302I$ $a = 1.69262 + 2.92394I$ $b = -1.05605 - 1.10417I$	$8.52509 - 4.00354I$	$1.85103 + 2.75584I$
$u = 0.834305 + 0.026519I$ $a = -2.03456 - 2.80224I$ $b = 1.11558 + 1.09067I$	$4.18745 + 1.80014I$	$0.034492 - 1.194140I$
$u = 0.834305 - 0.026519I$ $a = -2.03456 + 2.80224I$ $b = 1.11558 - 1.09067I$	$4.18745 - 1.80014I$	$0.034492 + 1.194140I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.481295 + 1.085350I$ $a = -1.52416 - 1.39190I$ $b = 0.840283 + 1.091050I$	$1.64682 - 4.91710I$	$-3.75732 + 2.86803I$
$u = 0.481295 - 1.085350I$ $a = -1.52416 + 1.39190I$ $b = 0.840283 - 1.091050I$	$1.64682 + 4.91710I$	$-3.75732 - 2.86803I$
$u = -0.027576 + 1.213260I$ $a = 0.097830 + 0.955725I$ $b = 0.987113 - 0.071189I$	$-4.06865 - 0.00938I$	$-7.42868 + 0.I$
$u = -0.027576 - 1.213260I$ $a = 0.097830 - 0.955725I$ $b = 0.987113 + 0.071189I$	$-4.06865 + 0.00938I$	$-7.42868 + 0.I$
$u = -0.310904 + 1.181390I$ $a = -0.21426 - 1.54867I$ $b = 0.294215 + 0.670186I$	$-1.38332 - 2.86199I$	$0. + 3.33644I$
$u = -0.310904 - 1.181390I$ $a = -0.21426 + 1.54867I$ $b = 0.294215 - 0.670186I$	$-1.38332 + 2.86199I$	$0. - 3.33644I$
$u = 0.159859 + 1.260150I$ $a = 1.07101 - 1.51572I$ $b = -1.63864 + 0.16074I$	$-11.89460 + 2.24035I$	$-8.35575 + 0.I$
$u = 0.159859 - 1.260150I$ $a = 1.07101 + 1.51572I$ $b = -1.63864 - 0.16074I$	$-11.89460 - 2.24035I$	$-8.35575 + 0.I$
$u = 0.433209 + 1.205320I$ $a = 1.56995 + 1.36216I$ $b = -0.89067 - 1.16692I$	$5.04167 + 0.68814I$	0
$u = 0.433209 - 1.205320I$ $a = 1.56995 - 1.36216I$ $b = -0.89067 + 1.16692I$	$5.04167 - 0.68814I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.091883 + 1.292420I$ $a = 0.68882 + 2.04860I$ $b = 0.100880 - 0.832088I$	$-5.73773 - 2.01190I$	0
$u = -0.091883 - 1.292420I$ $a = 0.68882 - 2.04860I$ $b = 0.100880 + 0.832088I$	$-5.73773 + 2.01190I$	0
$u = 0.378074 + 1.248800I$ $a = -0.30888 + 2.43252I$ $b = 1.23412 - 0.93095I$	$0.40714 + 2.55603I$	0
$u = 0.378074 - 1.248800I$ $a = -0.30888 - 2.43252I$ $b = 1.23412 + 0.93095I$	$0.40714 - 2.55603I$	0
$u = -0.233067 + 1.286920I$ $a = -1.54727 - 1.27295I$ $b = -0.472121 + 0.195549I$	$-4.28958 - 3.06247I$	$-27.0240 + 0.I$
$u = -0.233067 - 1.286920I$ $a = -1.54727 + 1.27295I$ $b = -0.472121 - 0.195549I$	$-4.28958 + 3.06247I$	$-27.0240 + 0.I$
$u = 0.376537 + 1.291220I$ $a = -1.67227 - 1.26273I$ $b = 0.99238 + 1.22341I$	$0.08117 + 6.15166I$	0
$u = 0.376537 - 1.291220I$ $a = -1.67227 + 1.26273I$ $b = 0.99238 - 1.22341I$	$0.08117 - 6.15166I$	0
$u = -0.594574 + 0.259179I$ $a = -0.442778 + 1.247600I$ $b = -0.223270 - 0.529291I$	$1.36466 - 0.79548I$	$4.15835 + 2.62510I$
$u = -0.594574 - 0.259179I$ $a = -0.442778 - 1.247600I$ $b = -0.223270 + 0.529291I$	$1.36466 + 0.79548I$	$4.15835 - 2.62510I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.173829+1.352770I$ $a=-0.626070+0.431699I$ $b=-0.604107-0.273968I$	$-3.74207-3.36112I$	0
$u=-0.173829-1.352770I$ $a=-0.626070-0.431699I$ $b=-0.604107+0.273968I$	$-3.74207+3.36112I$	0
$u=-0.615344$ $a=-2.94504$ $b=-0.368354$	-0.259777	-41.6450
$u=\ \ 0.399717+1.327110I$ $a=\ \ 0.22643-2.45843I$ $b=-1.17155+1.01534I$	$4.14207+8.58803I$	0
$u=\ \ 0.399717-1.327110I$ $a=\ \ 0.22643+2.45843I$ $b=-1.17155-1.01534I$	$4.14207-8.58803I$	0
$u=-0.40967+1.36131I$ $a=\ \ 0.064099+1.291930I$ $b=-0.432795-0.645865I$	$-3.33493-5.79576I$	0
$u=-0.40967-1.36131I$ $a=\ \ 0.064099-1.291930I$ $b=-0.432795+0.645865I$	$-3.33493+5.79576I$	0
$u=\ \ 0.38534+1.38238I$ $a=-0.15294+2.46124I$ $b=\ \ 1.12554-1.06328I$	$-0.4279+14.3330I$	0
$u=\ \ 0.38534-1.38238I$ $a=-0.15294-2.46124I$ $b=\ \ 1.12554+1.06328I$	$-0.4279-14.3330I$	0
$u=-0.11768+1.50035I$ $a=-0.220688-0.588458I$ $b=\ \ 0.779647+0.534509I$	$-7.68575-5.74695I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.11768-1.50035I$ $a=-0.220688+0.588458I$ $b=\ \ 0.779647-0.534509I$	$-7.68575+5.74695I$	0
$u=\ \ 0.466619$ $a=\ \ 4.22060$ $b=-1.54831$	-8.02557	-22.5480
$u=-0.280147+0.187854I$ $a=\ \ 2.57065+1.29057I$ $b=\ \ 0.441345-0.382694I$	$-1.25055-0.68721I$	$-6.23111-2.03128I$
$u=-0.280147-0.187854I$ $a=\ \ 2.57065-1.29057I$ $b=\ \ 0.441345+0.382694I$	$-1.25055+0.68721I$	$-6.23111+2.03128I$
$u=\ \ 0.0963991$ $a=-5.35560$ $b=\ \ 0.614065$	-0.870395	-12.0080

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 3u^2a + 9u^2 - 3a + u - 1$

(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_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.215080 + 1.307140I$ $a = -0.924253 + 0.460350I$ $b = -0.618034$	$-4.01109 - 2.82812I$	$-8.01769 - 5.87116I$
$u = -0.215080 + 1.307140I$ $a = -1.19831 - 1.20521I$ $b = \quad 1.61803$	$-11.90680 - 2.82812I$	$-8.63833 + 7.89410I$
$u = -0.215080 - 1.307140I$ $a = -0.924253 - 0.460350I$ $b = -0.618034$	$-4.01109 + 2.82812I$	$-8.01769 + 5.87116I$
$u = -0.215080 - 1.307140I$ $a = -1.19831 + 1.20521I$ $b = \quad 1.61803$	$-11.90680 + 2.82812I$	$-8.63833 - 7.89410I$
$u = -0.569840$ $a = \quad 0.0845740$ $b = -0.618034$	0.126494	1.18130
$u = -0.569840$ $a = -3.83945$ $b = \quad 1.61803$	-7.76919	9.13080

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_2	$((u^2+u-1)^3)(u^{45}-4u^{44}+\cdots+3u-1)$
c_3	$((u^2+u-1)^3)(u^{45}+4u^{44}+\cdots-u+1)$
c_4	$((u^2-u-1)^3)(u^{45}-4u^{44}+\cdots+3u-1)$
c_5, c_9	$u^6(u^{45}+3u^{44}+\cdots+160u+64)$
c_6	$((u^2-u-1)^3)(u^{45}+4u^{44}+\cdots-u+1)$
c_7, c_8	$((u^3+u^2+2u+1)^2)(u^{45}+3u^{44}+\cdots-8u-1)$
c_{10}	$((u^3+u^2-1)^2)(u^{45}-3u^{44}+\cdots-542u-97)$
c_{11}	$((u^3-u^2+2u-1)^2)(u^{45}+3u^{44}+\cdots-8u-1)$
c_{12}	$((u^3+u^2-1)^2)(u^{45}+19u^{44}+\cdots+653792u-13633)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$((y^2-3y+1)^3)(y^{45}-34y^{44}+\cdots+5y-1)$
c_3, c_6	$((y^2-3y+1)^3)(y^{45}-6y^{44}+\cdots+5y-1)$
c_5, c_9	$y^6(y^{45}+35y^{44}+\cdots+58368y-4096)$
c_7, c_8, c_{11}	$((y^3+3y^2+2y-1)^2)(y^{45}+37y^{44}+\cdots+120y-1)$
c_{10}	$((y^3-y^2+2y-1)^2)(y^{45}-39y^{44}+\cdots+1081792y-9409)$
c_{12}	$(y^3-y^2+2y-1)^2$ $\cdot\,(y^{45}-59y^{44}+\cdots+530299074808y-185858689)$