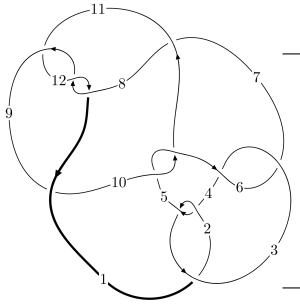
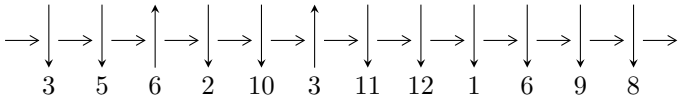
$12n_{0117}$ $(K12n_{0117})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -1.31243 \times 10^{79} u^{53} + 2.52611 \times 10^{79} u^{52} + \cdots + 3.89056 \times 10^{79} b + 3.47087 \times 10^{79},$$
$$- 6.05548 \times 10^{79} u^{53} + 8.73883 \times 10^{79} u^{52} + \cdots + 3.89056 \times 10^{79} a + 1.31119 \times 10^{80},\ u^{54} - 2u^{53} + \cdots - u +$$
$$I_2^u = \langle b + 1,\ u^5 - 4u^3 - u^2 + a + 4u + 3,\ u^6 - u^5 - 3u^4 + 2u^3 + 2u^2 + u - 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 60 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.

$\boldsymbol{I_1^u = \langle -1.31\times 10^{79}u^{53}+2.53\times 10^{79}u^{52}+\cdots+3.89\times 10^{79}b+3.47\times 10^{79},\ -6.06\times 10^{79}u^{53}+8.74\times 10^{79}u^{52}+\cdots+3.89\times 10^{79}a+1.31\times 10^{80},\ u^{54}-2u^{53}+\cdots-u+1\rangle}$

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} 1.55645u^{53} - 2.24616u^{52} + \cdots - 5.64280u - 3.37019 \\ 0.337337u^{53} - 0.649292u^{52} + \cdots - 1.00166u - 0.892127 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.494692u^{53} - 0.863004u^{52} + \cdots - 1.15347u - 0.702997 \\ 0.0990880u^{53} - 0.268680u^{52} + \cdots - 0.626964u - 0.0224128 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0.356510u^{53} - 0.587357u^{52} + \cdots - 0.776606u - 0.657794 \\ 0.241891u^{53} - 0.521606u^{52} + \cdots - 0.866363u - 0.0668977 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1.89379u^{53} - 2.89546u^{52} + \cdots - 6.64447u - 4.26232 \\ 0.337337u^{53} - 0.649292u^{52} + \cdots - 1.00166u - 0.892127 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.422066u^{53} - 0.798929u^{52} + \cdots - 1.41212u - 0.599029 \\ 0.0726263u^{53} - 0.0640750u^{52} + \cdots + 0.258652u - 0.103967 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1.61205u^{53} - 2.39082u^{52} + \cdots - 5.95476u - 3.39557 \\ 0.312040u^{53} - 0.627049u^{52} + \cdots - 1.09072u - 0.858664 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.224414u^{53} - 0.297818u^{52} + \cdots + 1.50104u - 0.620789 \\ -0.00237699u^{53} - 0.0155895u^{52} + \cdots + 0.993052u - 0.0916897 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.0386938u^{53} + 0.107824u^{52} + \cdots - 0.761082u - 0.0321440 \\ 0.281009u^{53} - 0.285348u^{52} + \cdots + 1.09523u - 0.220603 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -7.59111u^{53} + 13.1261u^{52} + \cdots + 13.3633u - 0.108982$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{54}+21u^{53}+\cdots+622u+1$
c_2, c_4	$u^{54}-7u^{53}+\cdots-26u+1$
c_3, c_6	$u^{54}+7u^{53}+\cdots+768u+64$
c_5, c_{10}	$u^{54}-2u^{53}+\cdots-u+1$
c_7, c_9	$u^{54}+2u^{53}+\cdots+141u+17$
c_8, c_{11}, c_{12}	$u^{54}-2u^{53}+\cdots+5u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{54} + 31y^{53} + \cdots - 394862y + 1$
c_2, c_4	$y^{54} - 21y^{53} + \cdots - 622y + 1$
c_3, c_6	$y^{54} - 39y^{53} + \cdots - 147456y + 4096$
c_5, c_{10}	$y^{54} - 14y^{53} + \cdots - 13y + 1$
c_7, c_9	$y^{54} - 26y^{53} + \cdots - 1997y + 289$
c_8, c_{11}, c_{12}	$y^{54} + 46y^{53} + \cdots - 13y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.768246+0.418674I$ $a=\ \ 0.229316-1.287030I$ $b=-0.920583+0.946817I$	$0.59137+6.88514I$	$-9.74374-8.93563I$
$u=-0.768246-0.418674I$ $a=\ \ 0.229316+1.287030I$ $b=-0.920583-0.946817I$	$0.59137-6.88514I$	$-9.74374+8.93563I$
$u=\ \ 0.607809+0.618855I$ $a=\ \ 0.260894+0.992870I$ $b=-0.199900-0.710236I$	$3.57906-1.48496I$	$-4.05718+4.03244I$
$u=\ \ 0.607809-0.618855I$ $a=\ \ 0.260894-0.992870I$ $b=-0.199900+0.710236I$	$3.57906+1.48496I$	$-4.05718-4.03244I$
$u=-0.764967+0.849835I$ $a=-0.290324-0.846955I$ $b=\ \ 0.429432+1.086500I$	$1.86993+4.42374I$	0
$u=-0.764967-0.849835I$ $a=-0.290324+0.846955I$ $b=\ \ 0.429432-1.086500I$	$1.86993-4.42374I$	0
$u=\ \ 0.704848+0.923652I$ $a=-0.256437+0.652141I$ $b=\ \ 0.534153-0.864717I$	$3.77813-0.69821I$	0
$u=\ \ 0.704848-0.923652I$ $a=-0.256437-0.652141I$ $b=\ \ 0.534153+0.864717I$	$3.77813+0.69821I$	0
$u=\ \ 0.746032+0.376084I$ $a=\ \ 0.208695+1.272420I$ $b=-1.000010-0.815508I$	$-3.84826-3.29989I$	$-15.7501+7.0561I$
$u=\ \ 0.746032-0.376084I$ $a=\ \ 0.208695-1.272420I$ $b=-1.000010+0.815508I$	$-3.84826+3.29989I$	$-15.7501-7.0561I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.803876 + 0.851386I$ $a = -0.369782 + 0.893548I$ $b = 0.480584 - 1.193560I$	$6.92007 - 8.14255I$	0
$u = 0.803876 - 0.851386I$ $a = -0.369782 - 0.893548I$ $b = 0.480584 + 1.193560I$	$6.92007 + 8.14255I$	0
$u = -0.741661 + 0.299782I$ $a = 0.129845 - 1.191170I$ $b = -1.173070 + 0.667650I$	$-0.523210 - 0.060545I$	$-12.38307 - 2.35064I$
$u = -0.741661 - 0.299782I$ $a = 0.129845 + 1.191170I$ $b = -1.173070 - 0.667650I$	$-0.523210 + 0.060545I$	$-12.38307 + 2.35064I$
$u = 0.773740 + 0.056042I$ $a = -0.048323 + 0.281192I$ $b = -1.57214 - 0.14784I$	$-1.63990 - 3.52551I$	$-13.9655 + 3.9216I$
$u = 0.773740 - 0.056042I$ $a = -0.048323 - 0.281192I$ $b = -1.57214 + 0.14784I$	$-1.63990 + 3.52551I$	$-13.9655 - 3.9216I$
$u = -0.761194$ $a = -0.126584$ $b = -1.55203$	-5.56883	-19.2640
$u = -0.801458 + 0.970429I$ $a = -0.477469 - 0.628269I$ $b = 0.772246 + 0.988987I$	$10.54700 + 0.04212I$	0
$u = -0.801458 - 0.970429I$ $a = -0.477469 + 0.628269I$ $b = 0.772246 - 0.988987I$	$10.54700 - 0.04212I$	0
$u = 1.029720 + 0.727275I$ $a = 0.864484 - 1.045500I$ $b = 0.745526 + 0.764163I$	$6.18806 + 2.15434I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.029720 - 0.727275I$ $a = 0.864484 + 1.045500I$ $b = 0.745526 - 0.764163I$	$6.18806 - 2.15434I$	0
$u = 0.680095 + 1.079720I$ $a = -0.295388 + 0.394253I$ $b = 0.744693 - 0.637616I$	$3.23226 - 0.56101I$	0
$u = 0.680095 - 1.079720I$ $a = -0.295388 - 0.394253I$ $b = 0.744693 + 0.637616I$	$3.23226 + 0.56101I$	0
$u = -1.094030 + 0.729061I$ $a = 0.716084 + 0.962560I$ $b = 0.826123 - 0.670841I$	$0.83207 + 1.55401I$	0
$u = -1.094030 - 0.729061I$ $a = 0.716084 - 0.962560I$ $b = 0.826123 + 0.670841I$	$0.83207 - 1.55401I$	0
$u = 0.545482 + 0.387512I$ $a = 1.49627 + 0.17225I$ $b = -0.109480 + 0.221560I$	$3.26577 - 2.10907I$	$-4.57255 + 4.21158I$
$u = 0.545482 - 0.387512I$ $a = 1.49627 - 0.17225I$ $b = -0.109480 - 0.221560I$	$3.26577 + 2.10907I$	$-4.57255 - 4.21158I$
$u = -0.549686 + 0.379087I$ $a = 0.41820 - 1.65690I$ $b = -0.756383 + 0.350743I$	$-0.98992 + 1.28097I$	$-8.23381 - 4.95312I$
$u = -0.549686 - 0.379087I$ $a = 0.41820 + 1.65690I$ $b = -0.756383 - 0.350743I$	$-0.98992 - 1.28097I$	$-8.23381 + 4.95312I$
$u = -0.765980 + 1.114890I$ $a = -0.423959 - 0.343278I$ $b = 0.903717 + 0.672502I$	$0.58680 - 3.64832I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.765980-1.114890I$ $a=-0.423959+0.343278I$ $b=\ \ 0.903717-0.672502I$	$0.58680+3.64832I$	0
$u=-1.072810+0.850554I$ $a=\ \ 0.521225+1.271540I$ $b=\ \ 1.038160-0.833697I$	$9.68000+6.67132I$	0
$u=-1.072810-0.850554I$ $a=\ \ 0.521225-1.271540I$ $b=\ \ 1.038160+0.833697I$	$9.68000-6.67132I$	0
$u=\ \ 0.809181+1.110190I$ $a=-0.498165+0.338281I$ $b=\ \ 0.978433-0.715727I$	$5.47300+7.77762I$	0
$u=\ \ 0.809181-1.110190I$ $a=-0.498165-0.338281I$ $b=\ \ 0.978433+0.715727I$	$5.47300-7.77762I$	0
$u=-0.355157+0.506837I$ $a=\ \ 3.09166-1.48155I$ $b=-0.790878-0.242839I$	$1.75113-3.66412I$	$-7.58424-2.09874I$
$u=-0.355157-0.506837I$ $a=\ \ 3.09166+1.48155I$ $b=-0.790878+0.242839I$	$1.75113+3.66412I$	$-7.58424+2.09874I$
$u=\ \ 1.127980+0.801217I$ $a=\ \ 0.525545-1.040990I$ $b=\ \ 0.975741+0.675989I$	$2.46104-5.73021I$	0
$u=\ \ 1.127980-0.801217I$ $a=\ \ 0.525545+1.040990I$ $b=\ \ 0.975741-0.675989I$	$2.46104+5.73021I$	0
$u=\ \ 1.13900+0.87943I$ $a=\ \ 0.314802-1.138340I$ $b=\ \ 1.146120+0.686785I$	$1.85511-6.51126I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.13900 - 0.87943I$ $a = 0.314802 + 1.138340I$ $b = 1.146120 - 0.686785I$	$1.85511 + 6.51126I$	0
$u = 1.11062 + 0.91730I$ $a = 0.232119 - 1.286790I$ $b = 1.24453 + 0.76770I$	$4.4865 - 15.0788I$	0
$u = 1.11062 - 0.91730I$ $a = 0.232119 + 1.286790I$ $b = 1.24453 - 0.76770I$	$4.4865 + 15.0788I$	0
$u = -1.12423 + 0.90674I$ $a = 0.249320 + 1.222810I$ $b = 1.21483 - 0.72751I$	$-0.55203 + 10.91430I$	0
$u = -1.12423 - 0.90674I$ $a = 0.249320 - 1.222810I$ $b = 1.21483 + 0.72751I$	$-0.55203 - 10.91430I$	0
$u = 0.298615 + 0.438132I$ $a = 3.44332 + 2.65285I$ $b = -0.886190 + 0.122203I$	$-2.63664 + 0.46428I$	$-17.5611 + 8.2084I$
$u = 0.298615 - 0.438132I$ $a = 3.44332 - 2.65285I$ $b = -0.886190 - 0.122203I$	$-2.63664 - 0.46428I$	$-17.5611 - 8.2084I$
$u = -0.158468 + 0.454530I$ $a = 5.77902 - 2.31620I$ $b = -1.028880 - 0.101463I$	$1.11313 + 2.46535I$	$1.5488 - 21.3906I$
$u = -0.158468 - 0.454530I$ $a = 5.77902 + 2.31620I$ $b = -1.028880 + 0.101463I$	$1.11313 - 2.46535I$	$1.5488 + 21.3906I$
$u = -0.455910$ $a = 1.15202$ $b = 0.0398888$	-0.785514	-12.5200

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.453888$ $a = -3.16883$ $b = -1.08168$	-2.16763	5.07630
$u = -1.61778 + 0.14927I$ $a = \quad 0.501712 + 0.090012I$ $b = \quad 0.800121 - 0.055050I$	$-4.90969 + 4.71375I$	0
$u = -1.61778 - 0.14927I$ $a = \quad 0.501712 - 0.090012I$ $b = \quad 0.800121 + 0.055050I$	$-4.90969 - 4.71375I$	0
$u = \quad 1.63817$ $a = \quad 0.498085$ $b = \quad 0.800035$	-8.87320	0

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -7u^5+3u^4+27u^3-5u^2-24u-26$

(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, c_7, c_9	$u^6 - u^5 - 3u^4 + 2u^3 + 2u^2 + u - 1$
c_8	$u^6 + u^5 + 3u^4 + 2u^3 + 2u^2 + u - 1$
c_{10}	$u^6 + u^5 - 3u^4 - 2u^3 + 2u^2 - u - 1$
c_{11}, c_{12}	$u^6 - u^5 + 3u^4 - 2u^3 + 2u^2 - u - 1$

(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_7, c_9 c_{10}	$y^6 - 7y^5 + 17y^4 - 16y^3 + 6y^2 - 5y + 1$
c_8, c_{11}, c_{12}	$y^6 + 5y^5 + 9y^4 + 4y^3 - 6y^2 - 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.493180+0.575288I$ $a=\ \ 0.26610-1.72116I$ $b=-1.00000$	$1.31531+1.97241I$	$-5.36986-2.86834I$
$u=-0.493180-0.575288I$ $a=\ \ 0.26610+1.72116I$ $b=-1.00000$	$1.31531-1.97241I$	$-5.36986+2.86834I$
$u=\ \ 0.483672$ $a=-4.27462$ $b=-1.00000$	-2.38379	-35.7440
$u=\ \ 1.52087+0.16310I$ $a=-0.417699+0.090629I$ $b=-1.00000$	$-5.34051-4.59213I$	$-17.7291+1.0120I$
$u=\ \ 1.52087-0.16310I$ $a=-0.417699-0.090629I$ $b=-1.00000$	$-5.34051+4.59213I$	$-17.7291-1.0120I$
$u=-1.53904$ $a=-0.422181$ $b=-1.00000$	-9.30502	-22.0580

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^6)(u^{54}+21u^{53}+\cdots+622u+1)$
c_2	$((u-1)^6)(u^{54}-7u^{53}+\cdots-26u+1)$
c_3, c_6	$u^6(u^{54}+7u^{53}+\cdots+768u+64)$
c_4	$((u+1)^6)(u^{54}-7u^{53}+\cdots-26u+1)$
c_5	$(u^6-u^5-3u^4+2u^3+2u^2+u-1)(u^{54}-2u^{53}+\cdots-u+1)$
c_7, c_9	$(u^6-u^5-3u^4+2u^3+2u^2+u-1)(u^{54}+2u^{53}+\cdots+141u+17)$
c_8	$(u^6+u^5+3u^4+2u^3+2u^2+u-1)(u^{54}-2u^{53}+\cdots+5u+1)$
c_{10}	$(u^6+u^5-3u^4-2u^3+2u^2-u-1)(u^{54}-2u^{53}+\cdots-u+1)$
c_{11}, c_{12}	$(u^6-u^5+3u^4-2u^3+2u^2-u-1)(u^{54}-2u^{53}+\cdots+5u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^6)(y^{54}+31y^{53}+\cdots-394862y+1)$
c_2, c_4	$((y-1)^6)(y^{54}-21y^{53}+\cdots-622y+1)$
c_3, c_6	$y^6(y^{54}-39y^{53}+\cdots-147456y+4096)$
c_5, c_{10}	$(y^6-7y^5+\cdots-5y+1)(y^{54}-14y^{53}+\cdots-13y+1)$
c_7, c_9	$(y^6-7y^5+17y^4-16y^3+6y^2-5y+1)$ $\cdot(y^{54}-26y^{53}+\cdots-1997y+289)$
c_8, c_{11}, c_{12}	$(y^6+5y^5+\cdots-5y+1)(y^{54}+46y^{53}+\cdots-13y+1)$