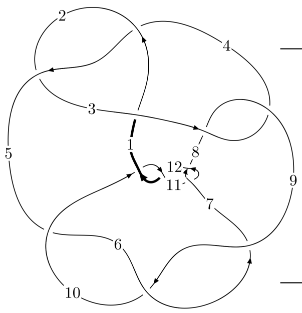
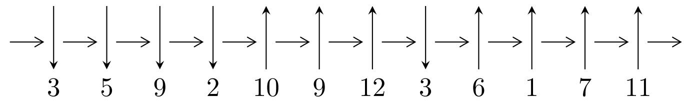
$12n_{0178}$ ($K12n_{0178}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle & 9.57275 \times 10^{53}u^{54} + 1.47300 \times 10^{54}u^{53} + \cdots + 8.10588 \times 10^{54}b + 5.80479 \times 10^{54}, \\ & -1.30447 \times 10^{55}u^{54} - 2.66313 \times 10^{55}u^{53} + \cdots + 8.10588 \times 10^{54}a - 2.06989 \times 10^{55},\ u^{55} + 2u^{54} + \cdots + 4u - \\ I_2^u = \langle & b+1,\ -u^3 - u^2 + a - 3u - 2,\ u^5 + u^4 + 4u^3 + 3u^2 + 3u + 1\rangle \end{aligned}$$

* 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.
$\boldsymbol{I_1^u = \langle 9.57\times10^{53}u^{54}+1.47\times10^{54}u^{53}+\cdots+8.11\times10^{54}b+5.80\times10^{54},\ -1.30\times10^{55}u^{54}-2.66\times10^{55}u^{53}+\cdots+8.11\times10^{54}a-2.07\times10^{55},\ u^{55}+2u^{54}+\cdots+4u+1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}1.60929u^{54}+3.28543u^{53}+\cdots-0.667235u+2.55356\\-0.118096u^{54}-0.181720u^{53}+\cdots+1.32185u-0.716120\end{pmatrix}$$
$$a_6 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1.49119u^{54}+3.10371u^{53}+\cdots+0.654617u+1.83744\\-0.118096u^{54}-0.181720u^{53}+\cdots+1.32185u-0.716120\end{pmatrix}$$
$$a_1 = \begin{pmatrix}0.0670214u^{54}+0.408100u^{53}+\cdots+0.231214u-0.865681\\-0.119667u^{54}-0.280385u^{53}+\cdots+1.25999u+0.229470\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-0.0627514u^{54}+0.225048u^{53}+\cdots+2.67144u+0.447681\\-0.115045u^{54}-0.310044u^{53}+\cdots+1.95308u+0.125113\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1.55763u^{54}+3.14463u^{53}+\cdots-0.402533u+2.59906\\-0.0743860u^{54}-0.0787220u^{53}+\cdots+0.855578u-0.799104\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u\\u^3+u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u^2+1\\-u^4-2u^2\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-0.451706u^{54}-0.711582u^{53}+\cdots+5.15586u+0.621849\\0.0254744u^{54}-0.291495u^{53}+\cdots-0.656683u-0.382675\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0.00353609u^{54}-0.0598773u^{53}+\cdots-2.34653u+0.394759\\0.0754811u^{54}+0.239141u^{53}+\cdots+0.161367u-0.119595\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4.76753u^{54}+0.155153u^{53}+\cdots+63.8827u+5.20939$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{55} + 24u^{54} + \cdots - 40u + 1$
c_2, c_4	$u^{55} - 6u^{54} + \cdots + 12u + 1$
c_3, c_8	$u^{55} + u^{54} + \cdots + 448u + 32$
c_5, c_6, c_9	$u^{55} + 2u^{54} + \cdots + 4u + 1$
c_7, c_{11}	$u^{55} + 2u^{54} + \cdots + 4u + 1$
c_{10}, c_{12}	$u^{55} - 20u^{54} + \cdots + 22u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{55} + 20y^{54} + \cdots - 40060y - 1$
c_2, c_4	$y^{55} - 24y^{54} + \cdots - 40y - 1$
c_3, c_8	$y^{55} + 33y^{54} + \cdots + 27136y - 1024$
c_5, c_6, c_9	$y^{55} + 44y^{54} + \cdots + 22y - 1$
c_7, c_{11}	$y^{55} - 20y^{54} + \cdots + 22y - 1$
c_{10}, c_{12}	$y^{55} + 32y^{54} + \cdots + 210y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.072313 + 0.999634I$ $a = 2.29927 - 6.60365I$ $b = -0.958174 - 0.009887I$	$-3.21384 - 2.03983I$	$-44.2012 - 7.6598I$
$u = 0.072313 - 0.999634I$ $a = 2.29927 + 6.60365I$ $b = -0.958174 + 0.009887I$	$-3.21384 + 2.03983I$	$-44.2012 + 7.6598I$
$u = 0.993934 + 0.162352I$ $a = -0.493168 + 1.055260I$ $b = 1.033280 - 0.648823I$	$0.91067 + 4.40051I$	$0.64951 - 3.45726I$
$u = 0.993934 - 0.162352I$ $a = -0.493168 - 1.055260I$ $b = 1.033280 + 0.648823I$	$0.91067 - 4.40051I$	$0.64951 + 3.45726I$
$u = -1.001870 + 0.130107I$ $a = -0.620284 - 1.134160I$ $b = 1.114800 + 0.710314I$	$2.39213 - 10.23010I$	$2.28495 + 7.44906I$
$u = -1.001870 - 0.130107I$ $a = -0.620284 + 1.134160I$ $b = 1.114800 - 0.710314I$	$2.39213 + 10.23010I$	$2.28495 - 7.44906I$
$u = 0.137708 + 0.978085I$ $a = 0.876327 - 0.305252I$ $b = -0.0541745 + 0.0630040I$	$-1.78463 + 2.08708I$	$-0.67506 - 3.94082I$
$u = 0.137708 - 0.978085I$ $a = 0.876327 + 0.305252I$ $b = -0.0541745 - 0.0630040I$	$-1.78463 - 2.08708I$	$-0.67506 + 3.94082I$
$u = -0.920019 + 0.123504I$ $a = -0.295321 - 1.372000I$ $b = 0.879379 + 0.854012I$	$7.49655 - 3.13489I$	$7.28291 + 3.22695I$
$u = -0.920019 - 0.123504I$ $a = -0.295321 + 1.372000I$ $b = 0.879379 - 0.854012I$	$7.49655 + 3.13489I$	$7.28291 - 3.22695I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.210457 + 1.111180I$ $a = 0.166418 - 1.112530I$ $b = -0.533647 + 0.528199I$	$-1.62268 + 2.42881I$	0
$u = 0.210457 - 1.111180I$ $a = 0.166418 + 1.112530I$ $b = -0.533647 - 0.528199I$	$-1.62268 - 2.42881I$	0
$u = -0.085057 + 1.147710I$ $a = -0.91778 + 1.25610I$ $b = -1.132530 - 0.298762I$	$-4.28823 - 1.16800I$	0
$u = -0.085057 - 1.147710I$ $a = -0.91778 - 1.25610I$ $b = -1.132530 + 0.298762I$	$-4.28823 + 1.16800I$	0
$u = 0.828480 + 0.174420I$ $a = 0.110067 + 1.220490I$ $b = 0.608202 - 0.730301I$	$2.20429 + 0.89304I$	$2.75128 - 2.60461I$
$u = 0.828480 - 0.174420I$ $a = 0.110067 - 1.220490I$ $b = 0.608202 + 0.730301I$	$2.20429 - 0.89304I$	$2.75128 + 2.60461I$
$u = -0.819216 + 0.097633I$ $a = 0.17500 - 1.53413I$ $b = 0.550668 + 0.941243I$	$4.13978 + 4.18210I$	$5.23081 - 2.78874I$
$u = -0.819216 - 0.097633I$ $a = 0.17500 + 1.53413I$ $b = 0.550668 - 0.941243I$	$4.13978 - 4.18210I$	$5.23081 + 2.78874I$
$u = -0.146957 + 1.227320I$ $a = -0.250773 + 0.958708I$ $b = -1.25230 - 0.85045I$	$-5.99858 - 1.47280I$	0
$u = -0.146957 - 1.227320I$ $a = -0.250773 - 0.958708I$ $b = -1.25230 + 0.85045I$	$-5.99858 + 1.47280I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.381441 + 1.177740I$ $a = -0.265339 - 0.556912I$ $b = 0.209231 + 1.073740I$	$-0.86862 + 3.44583I$	0
$u = 0.381441 - 1.177740I$ $a = -0.265339 + 0.556912I$ $b = 0.209231 - 1.073740I$	$-0.86862 - 3.44583I$	0
$u = 0.177845 + 1.232580I$ $a = -0.197287 - 0.999523I$ $b = -1.11540 + 1.02762I$	$-5.34328 + 6.53526I$	0
$u = 0.177845 - 1.232580I$ $a = -0.197287 + 0.999523I$ $b = -1.11540 - 1.02762I$	$-5.34328 - 6.53526I$	0
$u = -0.014389 + 1.247610I$ $a = -0.396154 + 0.123893I$ $b = -1.75259 - 0.09946I$	$-7.40193 - 2.54973I$	0
$u = -0.014389 - 1.247610I$ $a = -0.396154 - 0.123893I$ $b = -1.75259 + 0.09946I$	$-7.40193 + 2.54973I$	0
$u = 0.614835 + 1.102710I$ $a = -0.145574 + 0.034160I$ $b = 0.742661 + 0.465384I$	$-1.99257 + 1.17321I$	0
$u = 0.614835 - 1.102710I$ $a = -0.145574 - 0.034160I$ $b = 0.742661 - 0.465384I$	$-1.99257 - 1.17321I$	0
$u = -0.468976 + 1.184810I$ $a = -0.356235 + 0.277549I$ $b = 0.611745 - 0.951185I$	$4.23996 - 1.81305I$	0
$u = -0.468976 - 1.184810I$ $a = -0.356235 - 0.277549I$ $b = 0.611745 + 0.951185I$	$4.23996 + 1.81305I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.394816 + 1.214720I$ $a = -0.407055 + 0.558974I$ $b = 0.327121 - 1.259930I$	$0.69756 - 8.56499I$	0
$u = -0.394816 - 1.214720I$ $a = -0.407055 - 0.558974I$ $b = 0.327121 + 1.259930I$	$0.69756 + 8.56499I$	0
$u = -0.601783 + 1.184100I$ $a = -0.280221 - 0.060494I$ $b = 0.893170 - 0.577080I$	$-0.82436 + 4.63316I$	0
$u = -0.601783 - 1.184100I$ $a = -0.280221 + 0.060494I$ $b = 0.893170 + 0.577080I$	$-0.82436 - 4.63316I$	0
$u = -0.33663 + 1.38775I$ $a = 0.970187 - 0.767712I$ $b = 0.813537 + 0.578538I$	$-0.568084 + 0.034758I$	0
$u = -0.33663 - 1.38775I$ $a = 0.970187 + 0.767712I$ $b = 0.813537 - 0.578538I$	$-0.568084 - 0.034758I$	0
$u = -0.42146 + 1.38024I$ $a = 0.787185 - 1.119040I$ $b = 1.083980 + 0.732016I$	$2.75927 - 7.95467I$	0
$u = -0.42146 - 1.38024I$ $a = 0.787185 + 1.119040I$ $b = 1.083980 - 0.732016I$	$2.75927 + 7.95467I$	0
$u = -0.46185 + 1.38681I$ $a = 0.562764 - 1.256260I$ $b = 1.29657 + 0.72034I$	$-2.3616 - 15.4470I$	0
$u = -0.46185 - 1.38681I$ $a = 0.562764 + 1.256260I$ $b = 1.29657 - 0.72034I$	$-2.3616 + 15.4470I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.45518 + 1.39872I$ $a = 0.558722 + 1.163830I$ $b = 1.25544 - 0.65692I$	$-3.98197 + 9.57742I$	0
$u = 0.45518 - 1.39872I$ $a = 0.558722 - 1.163830I$ $b = 1.25544 + 0.65692I$	$-3.98197 - 9.57742I$	0
$u = 0.38456 + 1.42439I$ $a = 0.750991 + 0.847131I$ $b = 0.988852 - 0.539464I$	$-2.92074 + 5.31715I$	0
$u = 0.38456 - 1.42439I$ $a = 0.750991 - 0.847131I$ $b = 0.988852 + 0.539464I$	$-2.92074 - 5.31715I$	0
$u = 0.443695 + 0.152031I$ $a = 2.39257 - 1.10066I$ $b = -0.785702 + 0.556656I$	$-1.28934 + 4.28381I$	$2.06004 - 6.33313I$
$u = 0.443695 - 0.152031I$ $a = 2.39257 + 1.10066I$ $b = -0.785702 - 0.556656I$	$-1.28934 - 4.28381I$	$2.06004 + 6.33313I$
$u = 0.458210 + 0.088205I$ $a = 1.25519 + 0.67781I$ $b = -0.128180 - 0.374679I$	$1.217180 + 0.208314I$	$8.43782 - 0.43348I$
$u = 0.458210 - 0.088205I$ $a = 1.25519 - 0.67781I$ $b = -0.128180 + 0.374679I$	$1.217180 - 0.208314I$	$8.43782 + 0.43348I$
$u = -0.359115 + 0.183471I$ $a = 2.71826 + 0.82408I$ $b = -0.926073 - 0.380961I$	$-1.94814 + 0.37120I$	$-0.242965 - 0.911940I$
$u = -0.359115 - 0.183471I$ $a = 2.71826 - 0.82408I$ $b = -0.926073 + 0.380961I$	$-1.94814 - 0.37120I$	$-0.242965 + 0.911940I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.069012 + 0.377349I$ $a = 3.57577 + 0.18002I$ $b = -1.196500 - 0.044788I$	$-2.88229 - 2.31843I$	$4.89435 + 2.66761I$
$u = -0.069012 - 0.377349I$ $a = 3.57577 - 0.18002I$ $b = -1.196500 + 0.044788I$	$-2.88229 + 2.31843I$	$4.89435 - 2.66761I$
$u = 0.05440 + 1.73056I$ $a = 0.565358 + 0.054624I$ $b = 0.867697 - 0.027497I$	$-12.32020 + 3.39229I$	0
$u = 0.05440 - 1.73056I$ $a = 0.565358 - 0.054624I$ $b = 0.867697 + 0.027497I$	$-12.32020 - 3.39229I$	0
$u = -0.223807$ $a = 2.72223$ $b = -0.882156$	-1.26969	-9.83510

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

(i) Arc colorings

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

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

$$a_3 = \begin{pmatrix} u^3 + u^2 + 3u + 2 \\ -1 \end{pmatrix}$$

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

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

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

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

$$a_4 = \begin{pmatrix} u^3 + u^2 + 3u + 2 \\ -1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^4 + 3u^3 + 20u^2 + 8u + 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^5$
c_3, c_8	y^5
c_5, c_6, c_9 c_{10}, c_{12}	$y^5+7y^4+16y^3+13y^2+3y-1$
c_7, c_{11}	$y^5-y^4+4y^3-3y^2+3y-1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.233677 + 0.885557I$ $a = \quad 1.10636 + 1.69341I$ $b = -1.00000$	$-3.46474 - 2.21397I$	$-5.40639 - 0.42541I$
$u = -0.233677 - 0.885557I$ $a = \quad 1.10636 - 1.69341I$ $b = -1.00000$	$-3.46474 + 2.21397I$	$-5.40639 + 0.42541I$
$u = -0.416284$ $a = \quad 0.852303$ $b = -1.00000$	-0.762751	8.03930
$u = -0.05818 + 1.69128I$ $a = -0.532511 + 0.056433I$ $b = -1.00000$	$-12.60320 - 3.33174I$	$-15.6132 - 0.3694I$
$u = -0.05818 - 1.69128I$ $a = -0.532511 - 0.056433I$ $b = -1.00000$	$-12.60320 + 3.33174I$	$-15.6132 + 0.3694I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^5)(u^{55}+24u^{54}+\cdots-40u+1)$
c_2	$((u-1)^5)(u^{55}-6u^{54}+\cdots+12u+1)$
c_3, c_8	$u^5(u^{55}+u^{54}+\cdots+448u+32)$
c_4	$((u+1)^5)(u^{55}-6u^{54}+\cdots+12u+1)$
c_5, c_6	$(u^5+u^4+4u^3+3u^2+3u+1)(u^{55}+2u^{54}+\cdots+4u+1)$
c_7	$(u^5+u^4-u^2+u+1)(u^{55}+2u^{54}+\cdots+4u+1)$
c_9	$(u^5-u^4+4u^3-3u^2+3u-1)(u^{55}+2u^{54}+\cdots+4u+1)$
c_{10}	$(u^5+u^4+4u^3+3u^2+3u+1)(u^{55}-20u^{54}+\cdots+22u-1)$
c_{11}	$(u^5-u^4+u^2+u-1)(u^{55}+2u^{54}+\cdots+4u+1)$
c_{12}	$(u^5-u^4+4u^3-3u^2+3u-1)(u^{55}-20u^{54}+\cdots+22u-1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^5)(y^{55}+20y^{54}+\cdots-40060y-1)$
c_2, c_4	$((y-1)^5)(y^{55}-24y^{54}+\cdots-40y-1)$
c_3, c_8	$y^5(y^{55}+33y^{54}+\cdots+27136y-1024)$
c_5, c_6, c_9	$(y^5+7y^4+16y^3+13y^2+3y-1)(y^{55}+44y^{54}+\cdots+22y-1)$
c_7, c_{11}	$(y^5-y^4+4y^3-3y^2+3y-1)(y^{55}-20y^{54}+\cdots+22y-1)$
c_{10}, c_{12}	$(y^5+7y^4+16y^3+13y^2+3y-1)(y^{55}+32y^{54}+\cdots+210y-1)$