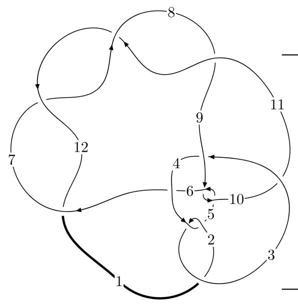
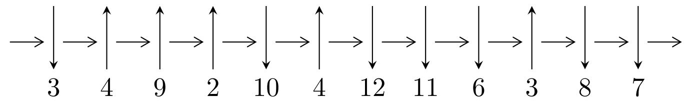
$12n_{0278}$ ($K12n_{0278}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u = \langle & -635380494822630u^{39} - 689616041260383u^{38} + \cdots + 14336000179114888b + 16776669646 73313,\\
& 2246684406994641u^{39} + 1078394006282716u^{38} + \cdots + 7168000089557440a + 9725037800310384,\\
& u^{40} + u^{39} + \cdots + 4u + 5\rangle \\
I_2^u = \langle & u^3b + 4u^2b - u^3 + b^2 - bu + u^2 - 2b - u - 4,\ -u^2 + a,\ u^4 - u^2 + 1\rangle
\end{aligned}
$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 48 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.

$\boldsymbol{I_1^u = \langle -6.35\times 10^{14}u^{39} - 6.90\times 10^{14}u^{38} + \cdots + 1.43\times 10^{15}b + 1.68\times 10^{15},\ 2.25\times 10^{15}u^{39} + 1.08\times 10^{15}u^{38} + \cdots + 7.17\times 10^{15}a + 9.73\times 10^{15},\ u^{40} + u^{39} + \cdots + 4u + 5\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_6 = \begin{pmatrix} -0.313433u^{39} - 0.150446u^{38} + \cdots + 1.82893u - 1.35673 \\ 0.443206u^{39} + 0.481038u^{38} + \cdots - 5.21478u - 1.17025 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.109699u^{39} + 0.157341u^{38} + \cdots - 2.47064u - 3.34191 \\ 0.331526u^{39} + 0.441625u^{38} + \cdots - 3.77990u - 0.649983 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.286938u^{39} - 0.370199u^{38} + \cdots + 5.00815u + 1.05379 \\ 0.190141u^{39} - 0.0380655u^{38} + \cdots - 2.69477u + 1.78981 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.0967963u^{39} - 0.408265u^{38} + \cdots + 2.31338u + 2.84360 \\ 0.190141u^{39} - 0.0380655u^{38} + \cdots - 2.69477u + 1.78981 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} u^4 - u^2 + 1 \\ -u^6 - u^2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.332958u^{39} + 0.469712u^{38} + \cdots - 6.44378u - 1.37541 \\ 0.255919u^{39} + 0.714505u^{38} + \cdots - 6.65923u - 4.34499 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.453947u^{39} + 0.662238u^{38} + \cdots - 5.70833u - 2.30072 \\ -0.0932185u^{39} - 0.0614314u^{38} + \cdots + 0.780423u + 1.26772 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= -\frac{10623651294159}{102400001279392}u^{39} - \frac{456995728030 11}{102400001279392}u^{38} + \cdots + \frac{228874377951323}{25600000319848}u + \frac{930610235166537}{102400001279392}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{40} + 41u^{39} + \cdots - 4756u + 625$
c_2, c_4	$u^{40} - 11u^{39} + \cdots - 216u + 25$
c_3	$u^{40} + u^{39} + \cdots + 4u + 5$
c_5, c_9	$u^{40} + u^{39} + \cdots + 13u^2 + 4$
c_6	$u^{40} + 5u^{39} + \cdots - 11820u + 18731$
c_7, c_8, c_{11} c_{12}	$u^{40} - u^{39} + \cdots - 8u + 1$
c_{10}	$u^{40} - 3u^{39} + \cdots + 1600u + 1984$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{40} - 79y^{39} + \cdots + 16952964y + 390625$
c_2, c_4	$y^{40} + 41y^{39} + \cdots - 4756y + 625$
c_3	$y^{40} - 11y^{39} + \cdots - 216y + 25$
c_5, c_9	$y^{40} + 13y^{39} + \cdots + 104y + 16$
c_6	$y^{40} + 31y^{39} + \cdots + 6061334998y + 350850361$
c_7, c_8, c_{11} c_{12}	$y^{40} + 45y^{39} + \cdots - 4y + 1$
c_{10}	$y^{40} + 15y^{39} + \cdots + 108480512y + 3936256$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.816138+0.601846I$ $a=-0.100989+0.484046I$ $b=\ \ 1.272200+0.371404I$	$9.03582-2.34742I$	$-1.16092+4.21084I$
$u=-0.816138-0.601846I$ $a=-0.100989-0.484046I$ $b=\ \ 1.272200-0.371404I$	$9.03582+2.34742I$	$-1.16092-4.21084I$
$u=\ \ 0.942774+0.425003I$ $a=\ \ 0.249731+0.561680I$ $b=\ \ 0.05704-1.50077I$	$1.43856+1.71130I$	$-1.298482+0.550005I$
$u=\ \ 0.942774-0.425003I$ $a=\ \ 0.249731-0.561680I$ $b=\ \ 0.05704+1.50077I$	$1.43856-1.71130I$	$-1.298482-0.550005I$
$u=\ \ 0.778485+0.532883I$ $a=\ \ 0.574413+1.007710I$ $b=\ \ 0.08684-1.66241I$	$1.51229+2.11244I$	$-4.00016-4.74712I$
$u=\ \ 0.778485-0.532883I$ $a=\ \ 0.574413-1.007710I$ $b=\ \ 0.08684+1.66241I$	$1.51229-2.11244I$	$-4.00016+4.74712I$
$u=-1.044590+0.339980I$ $a=-0.206550-0.804001I$ $b=\ \ 0.54339+2.06103I$	$1.66475-4.28233I$	$1.04865+9.16728I$
$u=-1.044590-0.339980I$ $a=-0.206550+0.804001I$ $b=\ \ 0.54339-2.06103I$	$1.66475+4.28233I$	$1.04865-9.16728I$
$u=-0.870167+0.752444I$ $a=\ \ 0.817881-0.905901I$ $b=\ \ 0.43266+2.06327I$	$6.83536-2.84310I$	$2.40205+2.94368I$
$u=-0.870167-0.752444I$ $a=\ \ 0.817881+0.905901I$ $b=\ \ 0.43266-2.06327I$	$6.83536+2.84310I$	$2.40205-2.94368I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.642627 + 0.538012I$ $a = 0.365174 - 0.413262I$ $b = 0.325214 - 0.141593I$	$0.58360 + 1.86035I$	$-1.76602 - 5.14793I$
$u = 0.642627 - 0.538012I$ $a = 0.365174 + 0.413262I$ $b = 0.325214 + 0.141593I$	$0.58360 - 1.86035I$	$-1.76602 + 5.14793I$
$u = -1.100630 + 0.389040I$ $a = 0.706000 - 0.374232I$ $b = -0.84428 + 1.49004I$	$7.52435 - 1.33305I$	$3.41871 + 0.66465I$
$u = -1.100630 - 0.389040I$ $a = 0.706000 + 0.374232I$ $b = -0.84428 - 1.49004I$	$7.52435 + 1.33305I$	$3.41871 - 0.66465I$
$u = 1.153370 + 0.265663I$ $a = -0.361327 + 0.909523I$ $b = 0.80159 - 2.60812I$	$8.28312 + 6.34531I$	$4.99183 - 5.94173I$
$u = 1.153370 - 0.265663I$ $a = -0.361327 - 0.909523I$ $b = 0.80159 + 2.60812I$	$8.28312 - 6.34531I$	$4.99183 + 5.94173I$
$u = -0.740318 + 0.931805I$ $a = -1.181910 + 0.030020I$ $b = -0.522469 - 0.429658I$	$0.02606 + 6.35035I$	$0.13702 - 2.71532I$
$u = -0.740318 - 0.931805I$ $a = -1.181910 - 0.030020I$ $b = -0.522469 + 0.429658I$	$0.02606 - 6.35035I$	$0.13702 + 2.71532I$
$u = -0.057006 + 0.799683I$ $a = 0.932252 - 0.995287I$ $b = 0.476313 + 0.200122I$	$4.23419 - 2.71559I$	$-0.50842 + 3.06868I$
$u = -0.057006 - 0.799683I$ $a = 0.932252 + 0.995287I$ $b = 0.476313 - 0.200122I$	$4.23419 + 2.71559I$	$-0.50842 - 3.06868I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.846654 + 0.893541I$ $a = 0.153750 - 0.996865I$ $b = -0.370640 + 1.101610I$	$-1.261380 + 0.472950I$	$-0.86316 - 1.46415I$
$u = 0.846654 - 0.893541I$ $a = 0.153750 + 0.996865I$ $b = -0.370640 - 1.101610I$	$-1.261380 - 0.472950I$	$-0.86316 + 1.46415I$
$u = 0.824369 + 0.917399I$ $a = -1.102340 + 0.038722I$ $b = -0.112606 + 0.389706I$	$-6.94288 - 2.71197I$	$-3.03827 + 2.61066I$
$u = 0.824369 - 0.917399I$ $a = -1.102340 - 0.038722I$ $b = -0.112606 - 0.389706I$	$-6.94288 + 2.71197I$	$-3.03827 - 2.61066I$
$u = -0.899972 + 0.889292I$ $a = -1.022400 - 0.107733I$ $b = 0.290479 - 0.280456I$	$-7.22089 - 2.24192I$	$-3.59196 + 2.70686I$
$u = -0.899972 - 0.889292I$ $a = -1.022400 + 0.107733I$ $b = 0.290479 + 0.280456I$	$-7.22089 + 2.24192I$	$-3.59196 - 2.70686I$
$u = 0.710509 + 0.109408I$ $a = -0.51036 - 1.45979I$ $b = -1.72253 + 1.95217I$	$11.47330 + 0.46021I$	$8.35615 + 1.19991I$
$u = 0.710509 - 0.109408I$ $a = -0.51036 + 1.45979I$ $b = -1.72253 - 1.95217I$	$11.47330 - 0.46021I$	$8.35615 - 1.19991I$
$u = -0.944065 + 0.869245I$ $a = 0.057186 + 1.042530I$ $b = -0.44747 - 1.75317I$	$-7.07974 - 4.25891I$	$-3.44151 + 2.27415I$
$u = -0.944065 - 0.869245I$ $a = 0.057186 - 1.042530I$ $b = -0.44747 + 1.75317I$	$-7.07974 + 4.25891I$	$-3.44151 - 2.27415I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.978094 + 0.843510I$ $a = -0.928803 + 0.191863I$ $b = 0.723604 + 0.076328I$	$-0.85183 + 5.95407I$	$-0.43798 - 3.29902I$
$u = 0.978094 - 0.843510I$ $a = -0.928803 - 0.191863I$ $b = 0.723604 - 0.076328I$	$-0.85183 - 5.95407I$	$-0.43798 + 3.29902I$
$u = 1.004740 + 0.837681I$ $a = -0.008007 - 1.067440I$ $b = -0.44665 + 2.27489I$	$-6.36974 + 9.19261I$	$-1.78825 - 7.32691I$
$u = 1.004740 - 0.837681I$ $a = -0.008007 + 1.067440I$ $b = -0.44665 - 2.27489I$	$-6.36974 - 9.19261I$	$-1.78825 + 7.32691I$
$u = -1.049340 + 0.798693I$ $a = -0.064393 + 1.081620I$ $b = -0.38142 - 2.75805I$	$1.00002 - 12.73120I$	$1.58755 + 7.13056I$
$u = -1.049340 - 0.798693I$ $a = -0.064393 - 1.081620I$ $b = -0.38142 + 2.75805I$	$1.00002 + 12.73120I$	$1.58755 - 7.13056I$
$u = -0.638290 + 0.118778I$ $a = -0.03687 - 1.63298I$ $b = -0.82110 + 1.58089I$	$3.42951 - 0.40840I$	$6.88413 - 1.45858I$
$u = -0.638290 - 0.118778I$ $a = -0.03687 + 1.63298I$ $b = -0.82110 - 1.58089I$	$3.42951 + 0.40840I$	$6.88413 + 1.45858I$
$u = -0.221109 + 0.591527I$ $a = 0.867559 + 0.657116I$ $b = 0.159826 - 0.034687I$	$-0.995483 + 0.739308I$	$-6.93097 - 3.32361I$
$u = -0.221109 - 0.591527I$ $a = 0.867559 - 0.657116I$ $b = 0.159826 + 0.034687I$	$-0.995483 - 0.739308I$	$-6.93097 + 3.32361I$

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

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

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

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

$$a_{11} = \begin{pmatrix} -u^3b - u^3 + 2u \\ -u^3b + u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} 0 \\ u^2 - 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0 \\ -u^2 + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^3 - 2u^2 - b - u + 1 \\ u^3b + 2u^3 - 2u^2 - b - 2u + 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^3b + u^3 + u^2 - 2u \\ 2u^3 + bu + 3u^2 + b - u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$(u^2 - u + 1)^4$
c_2	$(u^2 + u + 1)^4$
c_3	$(u^4 - u^2 + 1)^2$
c_5, c_9	$(u^2 + 1)^4$
c_6	$u^8 - 4u^7 + 7u^6 - 16u^5 + 36u^4 - 50u^3 + 55u^2 - 50u + 25$
c_7, c_8, c_{11} c_{12}	$(u^4 + 3u^2 + 1)^2$
c_{10}	$u^8 - 2u^7 + 3u^6 - 2u^5 - 4u^4 + 20u^3 - 5u^2 + 25$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y^2+y+1)^4$
c_3	$(y^2-y+1)^4$
c_5, c_9	$(y+1)^8$
c_6	$y^8-2y^7-7y^6-42y^5+116y^4+210y^3-175y^2+250y+625$
c_7, c_8, c_{11} c_{12}	$(y^2+3y+1)^4$
c_{10}	$y^8+2y^7-7y^6+42y^5+116y^4-210y^3-175y^2-250y+625$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = 0.500000 + 0.866025I$ $b = -0.53523 - 1.42303I$	$2.63189 + 2.02988I$	$6.00000 - 3.46410I$
$u = 0.866025 + 0.500000I$ $a = 0.500000 + 0.866025I$ $b = 1.40126 - 2.54107I$	$10.52760 + 2.02988I$	$6.00000 - 3.46410I$
$u = 0.866025 - 0.500000I$ $a = 0.500000 - 0.866025I$ $b = -0.53523 + 1.42303I$	$2.63189 - 2.02988I$	$6.00000 + 3.46410I$
$u = 0.866025 - 0.500000I$ $a = 0.500000 - 0.866025I$ $b = 1.40126 + 2.54107I$	$10.52760 - 2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 + 0.500000I$ $a = 0.500000 - 0.866025I$ $b = -1.40126 + 0.92303I$	$10.52760 - 2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 + 0.500000I$ $a = 0.500000 - 0.866025I$ $b = 0.53523 + 2.04107I$	$2.63189 - 2.02988I$	$6.00000 + 3.46410I$
$u = -0.866025 - 0.500000I$ $a = 0.500000 + 0.866025I$ $b = -1.40126 - 0.92303I$	$10.52760 + 2.02988I$	$6.00000 - 3.46410I$
$u = -0.866025 - 0.500000I$ $a = 0.500000 + 0.866025I$ $b = 0.53523 - 2.04107I$	$2.63189 + 2.02988I$	$6.00000 - 3.46410I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^4)(u^{40}+41u^{39}+\cdots-4756u+625)$
c_2	$((u^2+u+1)^4)(u^{40}-11u^{39}+\cdots-216u+25)$
c_3	$((u^4-u^2+1)^2)(u^{40}+u^{39}+\cdots+4u+5)$
c_4	$((u^2-u+1)^4)(u^{40}-11u^{39}+\cdots-216u+25)$
c_5, c_9	$((u^2+1)^4)(u^{40}+u^{39}+\cdots+13u^2+4)$
c_6	$(u^8-4u^7+7u^6-16u^5+36u^4-50u^3+55u^2-50u+25)$ $\cdot\,(u^{40}+5u^{39}+\cdots-11820u+18731)$
c_7, c_8, c_{11} c_{12}	$((u^4+3u^2+1)^2)(u^{40}-u^{39}+\cdots-8u+1)$
c_{10}	$(u^8-2u^7+3u^6-2u^5-4u^4+20u^3-5u^2+25)$ $\cdot\,(u^{40}-3u^{39}+\cdots+1600u+1984)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^2+y+1)^4)(y^{40}-79y^{39}+\cdots+1.69530\times 10^7 y+390625)$
c_2, c_4	$((y^2+y+1)^4)(y^{40}+41y^{39}+\cdots-4756y+625)$
c_3	$((y^2-y+1)^4)(y^{40}-11y^{39}+\cdots-216y+25)$
c_5, c_9	$((y+1)^8)(y^{40}+13y^{39}+\cdots+104y+16)$
c_6	$(y^8-2y^7-7y^6-42y^5+116y^4+210y^3-175y^2+250y+625)$ $\cdot(y^{40}+31y^{39}+\cdots+6061334998y+350850361)$
c_7, c_8, c_{11} c_{12}	$((y^2+3y+1)^4)(y^{40}+45y^{39}+\cdots-4y+1)$
c_{10}	$(y^8+2y^7-7y^6+42y^5+116y^4-210y^3-175y^2-250y+625)$ $\cdot(y^{40}+15y^{39}+\cdots+108480512y+3936256)$