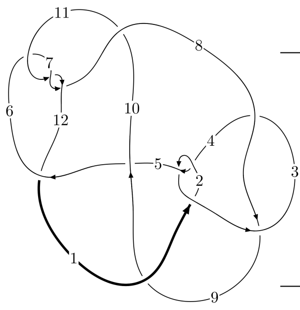
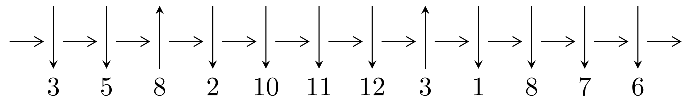
$12n_{0240}$ ($K12n_{0240}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{45} + u^{44} + \cdots + b + 2u,\ -2u^{45} + 2u^{44} + \cdots + a + 8u,\ u^{46} - 2u^{45} + \cdots + u + 1 \rangle$$
$$I_2^u = \langle u^3 + b - u + 1,\ u^6 - 3u^4 + 2u^2 + a + 1,\ u^8 + u^7 - 3u^6 - 2u^5 + 3u^4 + 2u - 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 54 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.

$$\boldsymbol{I^u_1 = \langle -u^{45}+u^{44}+\cdots+b+2u,\ -2u^{45}+2u^{44}+\cdots+a+8u,\ u^{46}-2u^{45}+\cdots+u+1\rangle}$$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}2u^{45}-2u^{44}+\cdots+10u^2-8u\\u^{45}-u^{44}+\cdots+5u^2-2u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}4u^{45}-4u^{44}+\cdots-10u-1\\u^{45}-u^{44}+\cdots+4u^2-3u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^3-2u\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^5-2u^3+u\\u^7-3u^5+2u^3+u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^{12}+5u^{10}-9u^8+6u^6-u^2+1\\-u^{14}+6u^{12}-13u^{10}+10u^8+2u^6-4u^4-u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}u^{45}-u^{44}+\cdots-8u+1\\u^{45}-u^{44}+\cdots+5u^2-u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u^{13}-6u^{11}+13u^9-10u^7-2u^5+4u^3+u\\-u^{13}+5u^{11}-9u^9+6u^7-u^3+u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -3u^{45}+56u^{43}+\cdots-5u-1$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{46} + 11u^{45} + \cdots + 25u + 1$
c_2, c_4	$u^{46} - 9u^{45} + \cdots - 9u + 1$
c_3, c_8	$u^{46} + u^{45} + \cdots + 1152u + 256$
c_5	$u^{46} - 2u^{45} + \cdots + 2660u + 1960$
c_6, c_7, c_{11}	$u^{46} + 2u^{45} + \cdots - u + 1$
c_9	$u^{46} + 2u^{45} + \cdots + 7u + 1$
c_{10}, c_{12}	$u^{46} - 6u^{45} + \cdots - 73u + 17$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{46} + 57y^{45} + \cdots - 21y + 1$
c_2, c_4	$y^{46} - 11y^{45} + \cdots - 25y + 1$
c_3, c_8	$y^{46} - 51y^{45} + \cdots - 1490944y + 65536$
c_5	$y^{46} + 18y^{45} + \cdots - 21367920y + 3841600$
c_6, c_7, c_{11}	$y^{46} - 38y^{45} + \cdots - 17y + 1$
c_9	$y^{46} + 54y^{45} + \cdots - 17y + 1$
c_{10}, c_{12}	$y^{46} + 34y^{45} + \cdots - 5737y + 289$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.088878 + 0.844041I$ $a = \ 3.37742 - 1.22551I$ $b = -2.98228 + 0.61868I$	$11.39320 + 1.80249I$	$-2.43037 - 0.91952I$
$u = -0.088878 - 0.844041I$ $a = \ 3.37742 + 1.22551I$ $b = -2.98228 - 0.61868I$	$11.39320 - 1.80249I$	$-2.43037 + 0.91952I$
$u = -0.116026 + 0.837306I$ $a = -3.46305 + 1.35399I$ $b = \ 3.14660 - 0.77902I$	$10.46260 + 9.14915I$	$-3.66280 - 5.53840I$
$u = -0.116026 - 0.837306I$ $a = -3.46305 - 1.35399I$ $b = \ 3.14660 + 0.77902I$	$10.46260 - 9.14915I$	$-3.66280 + 5.53840I$
$u = \ 1.141830 + 0.219995I$ $a = -0.660574 + 0.098342I$ $b = -0.127713 - 0.217138I$	$-1.38478 - 0.54129I$	$-5.73844 + 0.I$
$u = \ 1.141830 - 0.219995I$ $a = -0.660574 - 0.098342I$ $b = -0.127713 + 0.217138I$	$-1.38478 + 0.54129I$	$-5.73844 + 0.I$
$u = \ 0.058004 + 0.794656I$ $a = \ 1.48803 - 0.66681I$ $b = -1.176270 + 0.234722I$	$3.97447 - 2.81253I$	$-2.78364 + 4.01547I$
$u = \ 0.058004 - 0.794656I$ $a = \ 1.48803 + 0.66681I$ $b = -1.176270 - 0.234722I$	$3.97447 + 2.81253I$	$-2.78364 - 4.01547I$
$u = -1.139460 + 0.393221I$ $a = -1.60826 + 1.63861I$ $b = \ 2.48711 + 1.35446I$	$7.33193 - 4.71190I$	$-6.52326 + 0.I$
$u = -1.139460 - 0.393221I$ $a = -1.60826 - 1.63861I$ $b = \ 2.48711 - 1.35446I$	$7.33193 + 4.71190I$	$-6.52326 + 0.I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.175260 + 0.396885I$ $a = \quad 1.58950 - 1.52874I$ $b = -2.60724 - 1.21777I$	$8.06092 + 2.65955I$	0
$u = -1.175260 - 0.396885I$ $a = \quad 1.58950 + 1.52874I$ $b = -2.60724 + 1.21777I$	$8.06092 - 2.65955I$	0
$u = -0.027447 + 0.752835I$ $a = -2.58406 - 0.48560I$ $b = \quad 1.92495 + 0.96879I$	$1.16885 + 1.15848I$	$-5.01072 + 0.12391I$
$u = -0.027447 - 0.752835I$ $a = -2.58406 + 0.48560I$ $b = \quad 1.92495 - 0.96879I$	$1.16885 - 1.15848I$	$-5.01072 - 0.12391I$
$u = \quad 0.135112 + 0.737338I$ $a = -0.263549 - 0.833035I$ $b = \quad 0.030415 + 0.576766I$	$1.53760 - 3.03900I$	$-1.98360 + 5.04098I$
$u = \quad 0.135112 - 0.737338I$ $a = -0.263549 + 0.833035I$ $b = \quad 0.030415 - 0.576766I$	$1.53760 + 3.03900I$	$-1.98360 - 5.04098I$
$u = \quad 1.215480 + 0.337571I$ $a = \quad 0.103389 + 1.085520I$ $b = -0.822594 + 0.083089I$	$0.425497 - 1.277230I$	0
$u = \quad 1.215480 - 0.337571I$ $a = \quad 0.103389 - 1.085520I$ $b = -0.822594 - 0.083089I$	$0.425497 + 1.277230I$	0
$u = -1.259210 + 0.309211I$ $a = -0.456708 + 1.219730I$ $b = \quad 2.37986 - 0.29804I$	$-2.63767 + 2.66589I$	0
$u = -1.259210 - 0.309211I$ $a = -0.456708 - 1.219730I$ $b = \quad 2.37986 + 0.29804I$	$-2.63767 - 2.66589I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.308600 + 0.052486I$ $a = 0.039504 + 0.254143I$ $b = 0.45316 - 1.39921I$	$-5.32887 + 1.91338I$	0
$u = -1.308600 - 0.052486I$ $a = 0.039504 - 0.254143I$ $b = 0.45316 + 1.39921I$	$-5.32887 - 1.91338I$	0
$u = 1.31477$ $a = 1.61451$ $b = 0.0640641$	-6.82836	-12.1040
$u = -0.494895 + 0.460674I$ $a = 0.357271 - 1.172810I$ $b = 0.450500 - 0.532533I$	$5.38865 + 5.18412I$	$-6.71823 - 6.02395I$
$u = -0.494895 - 0.460674I$ $a = 0.357271 + 1.172810I$ $b = 0.450500 + 0.532533I$	$5.38865 - 5.18412I$	$-6.71823 + 6.02395I$
$u = 1.291940 + 0.323151I$ $a = -1.15932 - 1.41965I$ $b = 1.49071 - 1.53239I$	$-2.95162 - 5.04688I$	0
$u = 1.291940 - 0.323151I$ $a = -1.15932 + 1.41965I$ $b = 1.49071 + 1.53239I$	$-2.95162 + 5.04688I$	0
$u = -0.418017 + 0.505684I$ $a = -0.149306 + 0.739200I$ $b = -0.653704 + 0.563087I$	$5.63155 - 1.66298I$	$-5.86083 - 1.14993I$
$u = -0.418017 - 0.505684I$ $a = -0.149306 - 0.739200I$ $b = -0.653704 - 0.563087I$	$5.63155 + 1.66298I$	$-5.86083 + 1.14993I$
$u = -1.307310 + 0.347945I$ $a = 0.790380 - 0.475352I$ $b = -1.45484 - 0.59474I$	$-0.29502 + 6.93232I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.307310 - 0.347945I$ $a = 0.790380 + 0.475352I$ $b = -1.45484 + 0.59474I$	$-0.29502 - 6.93232I$	0
$u = 1.366120 + 0.148240I$ $a = -0.533420 - 0.484870I$ $b = -0.989531 + 0.198012I$	$0.048597 - 0.512586I$	0
$u = 1.366120 - 0.148240I$ $a = -0.533420 + 0.484870I$ $b = -0.989531 - 0.198012I$	$0.048597 + 0.512586I$	0
$u = -1.345150 + 0.312918I$ $a = 0.253414 + 0.362467I$ $b = 0.191334 - 0.810458I$	$-3.12507 + 6.85143I$	0
$u = -1.345150 - 0.312918I$ $a = 0.253414 - 0.362467I$ $b = 0.191334 + 0.810458I$	$-3.12507 - 6.85143I$	0
$u = 1.329650 + 0.375534I$ $a = 0.49137 + 2.28669I$ $b = -3.08691 - 0.08101I$	$6.94740 - 6.18607I$	0
$u = 1.329650 - 0.375534I$ $a = 0.49137 - 2.28669I$ $b = -3.08691 + 0.08101I$	$6.94740 + 6.18607I$	0
$u = -1.38696$ $a = -0.181617$ $b = 0.699740$	-7.20797	0
$u = 1.345460 + 0.367374I$ $a = -0.43223 - 2.36028I$ $b = 3.46843 + 0.20726I$	$5.8692 - 13.4842I$	0
$u = 1.345460 - 0.367374I$ $a = -0.43223 + 2.36028I$ $b = 3.46843 - 0.20726I$	$5.8692 + 13.4842I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.390620 + 0.107679I$ $a = 0.514855 + 0.841670I$ $b = 0.807363 - 0.612141I$	$-0.55483 - 6.96949I$	0
$u = 1.390620 - 0.107679I$ $a = 0.514855 - 0.841670I$ $b = 0.807363 + 0.612141I$	$-0.55483 + 6.96949I$	0
$u = 0.582853$ $a = -0.782593$ $b = 0.178233$	-1.21098	-7.83090
$u = 0.282232 + 0.263140I$ $a = -0.99274 - 1.11009I$ $b = 0.157868 + 0.383616I$	$-0.549820 - 0.931505I$	$-8.30910 + 7.33237I$
$u = 0.282232 - 0.263140I$ $a = -0.99274 + 1.11009I$ $b = 0.157868 - 0.383616I$	$-0.549820 + 0.931505I$	$-8.30910 - 7.33237I$
$u = -0.263046$ $a = 2.94586$ $b = 0.883552$	-2.04174	0.290920

II.

$$\boldsymbol{I^u_2 = \langle u^3+b-u+1,\ u^6-3u^4+2u^2+a+1,\ u^8+u^7-3u^6-2u^5+3u^4+2u-1\rangle}$$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^6+3u^4-2u^2-1\\-u^3+u-1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-u^6+3u^4-2u^2-1\\-u^3+u-1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^3-2u\\-u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^5-2u^3+u\\u^7-3u^5+2u^3+u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^3+2u\\u^3-u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-u^6+3u^4+u^3-2u^2-2u-1\\-2u^3+2u-1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^2+1\\-u^4+2u^2\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u^7-6u^6+2u^5+16u^4-5u^3-9u^2+8u-21$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^8$
c_3, c_8	y^8
c_5, c_9	$y^8 - 3y^7 + 7y^6 - 10y^5 + 11y^4 - 10y^3 + 6y^2 - 4y + 1$
c_6, c_7, c_{11}	$y^8 - 7y^7 + 19y^6 - 22y^5 + 3y^4 + 14y^3 - 6y^2 - 4y + 1$
c_{10}, c_{12}	$y^8 + 5y^7 + 11y^6 + 6y^5 - 17y^4 - 34y^3 - 22y^2 - 4y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.180120 + 0.268597I$ $a = -0.325934 + 0.693334I$ $b = -1.20799 - 0.83423I$	$-2.68559 - 1.13123I$	$-10.92586 + 0.21647I$
$u = 1.180120 - 0.268597I$ $a = -0.325934 - 0.693334I$ $b = -1.20799 + 0.83423I$	$-2.68559 + 1.13123I$	$-10.92586 - 0.21647I$
$u = 0.108090 + 0.747508I$ $a = 1.03462 - 0.99451I$ $b = -0.711982 + 1.138990I$	$0.51448 - 2.57849I$	$-8.77377 + 3.25417I$
$u = 0.108090 - 0.747508I$ $a = 1.03462 + 0.99451I$ $b = -0.711982 - 1.138990I$	$0.51448 + 2.57849I$	$-8.77377 - 3.25417I$
$u = -1.37100$ $a = -0.801005$ $b = 0.205997$	-8.14766	-19.8990
$u = -1.334530 + 0.318930I$ $a = 0.842429 - 0.289836I$ $b = -0.365014 - 1.352640I$	$-4.02461 + 6.44354I$	$-14.3478 - 4.5473I$
$u = -1.334530 - 0.318930I$ $a = 0.842429 + 0.289836I$ $b = -0.365014 + 1.352640I$	$-4.02461 - 6.44354I$	$-14.3478 + 4.5473I$
$u = 0.463640$ $a = -1.30123$ $b = -0.636025$	-2.48997	-19.0060

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^8)(u^{46}+11u^{45}+\cdots+25u+1)$
c_2	$((u-1)^8)(u^{46}-9u^{45}+\cdots-9u+1)$
c_3, c_8	$u^8(u^{46}+u^{45}+\cdots+1152u+256)$
c_4	$((u+1)^8)(u^{46}-9u^{45}+\cdots-9u+1)$
c_5	$(u^8-u^7-u^6+2u^5+u^4-2u^3+2u-1)$ $\cdot(u^{46}-2u^{45}+\cdots+2660u+1960)$
c_6, c_7	$(u^8+u^7-3u^6-2u^5+3u^4+2u-1)(u^{46}+2u^{45}+\cdots-u+1)$
c_9	$(u^8-u^7+\cdots+2u-1)(u^{46}+2u^{45}+\cdots+7u+1)$
c_{10}, c_{12}	$(u^8+3u^7+7u^6+10u^5+11u^4+10u^3+6u^2+4u+1)$ $\cdot(u^{46}-6u^{45}+\cdots-73u+17)$
c_{11}	$(u^8-u^7-3u^6+2u^5+3u^4-2u-1)(u^{46}+2u^{45}+\cdots-u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^8)(y^{46}+57y^{45}+\cdots-21y+1)$
c_2, c_4	$((y-1)^8)(y^{46}-11y^{45}+\cdots-25y+1)$
c_3, c_8	$y^8(y^{46}-51y^{45}+\cdots-1490944y+65536)$
c_5	$(y^8-3y^7+7y^6-10y^5+11y^4-10y^3+6y^2-4y+1)$ $\cdot(y^{46}+18y^{45}+\cdots-21367920y+3841600)$
c_6, c_7, c_{11}	$(y^8-7y^7+19y^6-22y^5+3y^4+14y^3-6y^2-4y+1)$ $\cdot(y^{46}-38y^{45}+\cdots-17y+1)$
c_9	$(y^8-3y^7+7y^6-10y^5+11y^4-10y^3+6y^2-4y+1)$ $\cdot(y^{46}+54y^{45}+\cdots-17y+1)$
c_{10}, c_{12}	$(y^8+5y^7+11y^6+6y^5-17y^4-34y^3-22y^2-4y+1)$ $\cdot(y^{46}+34y^{45}+\cdots-5737y+289)$