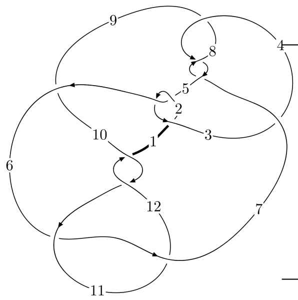
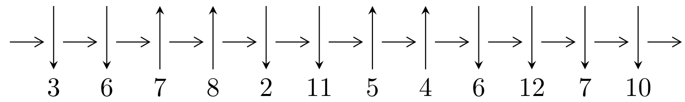
$12n_{0343}$ ($K12n_{0343}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle & 2.35414 \times 10^{25} u^{37} + 6.36686 \times 10^{22} u^{36} + \cdots + 1.08506 \times 10^{26} b + 7.17457 \times 10^{26}, \\ & -6.03496 \times 10^{25} u^{37} - 5.08818 \times 10^{25} u^{36} + \cdots + 1.08506 \times 10^{26} a - 2.36548 \times 10^{27},\ u^{38} + u^{37} + \cdots + 48u - \end{aligned}$$

$$I_2^u = \langle 4a^2u + 2a^2 + 9b - 9,\ 4a^3 + 4au - 2a - 5u - 2,\ u^2 + 2 \rangle$$

$$I_1^v = \langle a,\ b + v + 1,\ v^3 + 2v^2 + v + 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 47 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.

$$\boldsymbol{I^u_1 = \langle 2.35\times10^{25}u^{37}+6.37\times10^{22}u^{36}+\cdots+1.09\times10^{26}b+7.17\times10^{26},\ -6.03\times10^{25}u^{37}-5.09\times10^{25}u^{36}+\cdots+1.09\times10^{26}a-2.37\times10^{27},\ u^{38}+u^{37}+\cdots+48u+8\rangle}$$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} 0.556188u^{37} + 0.468931u^{36} + \cdots + 66.0065u + 21.8004 \\ -0.216959u^{37} - 0.000586775u^{36} + \cdots - 20.1029u - 6.61215 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.773147u^{37} + 0.469518u^{36} + \cdots + 86.1094u + 28.4126 \\ -0.216959u^{37} - 0.000586775u^{36} + \cdots - 20.1029u - 6.61215 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 0.540457u^{37} + 0.513997u^{36} + \cdots + 61.5142u + 18.9792 \\ 0.118184u^{37} - 0.103841u^{36} + \cdots - 10.8806u - 1.99927 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.931000u^{37} - 0.423758u^{36} + \cdots - 46.4113u - 16.9685 \\ 0.272358u^{37} + 0.0136024u^{36} + \cdots - 4.22233u - 0.0113747 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -1.34851u^{37} - 0.494264u^{36} + \cdots - 50.4295u - 19.4015 \\ 0.448295u^{37} + 0.0937407u^{36} + \cdots + 2.84945u + 2.20997 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.237267u^{37} - 0.770027u^{36} + \cdots - 6.76734u + 5.06203 \\ 0.216015u^{37} + 0.558969u^{36} + \cdots + 14.6047u + 0.926935 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{2139425831011290592558808 27}{108505904310727076649467996}u^{37} + \frac{14990483032110782558561765 1}{108505904310727076649467996}u^{36} + \cdots + \frac{502331039084465198350134206 6}{271264760776817691623669 99}u + \frac{1400899338503733927958392044}{27126476077681769162366999}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{38} + 10u^{37} + \cdots - 24u + 1$
c_2, c_5	$u^{38} + 4u^{37} + \cdots + 4u - 1$
c_3	$u^{38} - u^{37} + \cdots - 16u + 8$
c_4, c_7, c_8	$u^{38} + u^{37} + \cdots + 48u + 8$
c_6, c_{11}	$u^{38} - 2u^{37} + \cdots + u - 3$
c_9	$u^{38} + 2u^{37} + \cdots - 3029u - 7419$
c_{10}, c_{12}	$u^{38} + 8u^{37} + \cdots + 85u + 9$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{38} + 46y^{37} + \cdots + 1128y + 1$
c_2, c_5	$y^{38} - 10y^{37} + \cdots + 24y + 1$
c_3	$y^{38} - 53y^{37} + \cdots + 896y + 64$
c_4, c_7, c_8	$y^{38} + 31y^{37} + \cdots - 512y + 64$
c_6, c_{11}	$y^{38} - 8y^{37} + \cdots - 85y + 9$
c_9	$y^{38} + 120y^{37} + \cdots - 2146915177y + 55041561$
c_{10}, c_{12}	$y^{38} + 48y^{37} + \cdots + 1091y + 81$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.053800+0.148639I$ $a=-0.35198-1.75546I$ $b=\ \ 0.976993+0.905951I$	$12.2690-7.2289I$	$-0.96626+4.68407I$
$u=-1.053800-0.148639I$ $a=-0.35198+1.75546I$ $b=\ \ 0.976993-0.905951I$	$12.2690+7.2289I$	$-0.96626-4.68407I$
$u=-0.057390+0.931497I$ $a=\ \ 0.49812+1.63735I$ $b=-0.893541-0.823917I$	$0.10554-3.06762I$	$-6.46786+2.97828I$
$u=-0.057390-0.931497I$ $a=\ \ 0.49812-1.63735I$ $b=-0.893541+0.823917I$	$0.10554+3.06762I$	$-6.46786-2.97828I$
$u=\ \ 1.064480+0.094759I$ $a=-0.73343-1.41153I$ $b=\ \ 0.912968+0.941319I$	$12.47990+0.43824I$	$-0.562427-0.044649I$
$u=\ \ 1.064480-0.094759I$ $a=-0.73343+1.41153I$ $b=\ \ 0.912968-0.941319I$	$12.47990-0.43824I$	$-0.562427+0.044649I$
$u=\ \ 0.156341+1.111710I$ $a=\ \ 1.23758+0.87855I$ $b=\ \ 0.929752-0.586434I$	$-1.21085+3.08073I$	$-5.55249-3.17627I$
$u=\ \ 0.156341-1.111710I$ $a=\ \ 1.23758-0.87855I$ $b=\ \ 0.929752+0.586434I$	$-1.21085-3.08073I$	$-5.55249+3.17627I$
$u=-0.191591+1.141470I$ $a=-1.71195+0.26865I$ $b=-1.018780+0.030482I$	$-4.76428-2.22122I$	$-10.55897+3.42071I$
$u=-0.191591-1.141470I$ $a=-1.71195-0.26865I$ $b=-1.018780-0.030482I$	$-4.76428+2.22122I$	$-10.55897-3.42071I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.271471+0.749945I$ $a=-0.032046-0.267481I$ $b=\ \ 0.626757-0.614277I$	$-0.20728+1.53818I$	$-4.56900-2.28483I$
$u=-0.271471-0.749945I$ $a=-0.032046+0.267481I$ $b=\ \ 0.626757+0.614277I$	$-0.20728-1.53818I$	$-4.56900+2.28483I$
$u=\ \ 0.418841+1.156790I$ $a=-0.417466-0.176902I$ $b=\ \ 0.386654+0.764550I$	$0.11970+3.73317I$	$-2.97329-3.30525I$
$u=\ \ 0.418841-1.156790I$ $a=-0.417466+0.176902I$ $b=\ \ 0.386654-0.764550I$	$0.11970-3.73317I$	$-2.97329+3.30525I$
$u=\ \ 0.714927+0.180259I$ $a=\ \ 0.324913-1.250580I$ $b=-0.617135+0.730511I$	$3.04719+0.49757I$	$1.21153-1.20838I$
$u=\ \ 0.714927-0.180259I$ $a=\ \ 0.324913+1.250580I$ $b=-0.617135-0.730511I$	$3.04719-0.49757I$	$1.21153+1.20838I$
$u=\ \ 0.227184+0.682533I$ $a=\ \ 0.429035+0.360906I$ $b=\ \ 0.320049-0.507052I$	$-0.238421+1.266880I$	$-2.42303-5.08329I$
$u=\ \ 0.227184-0.682533I$ $a=\ \ 0.429035-0.360906I$ $b=\ \ 0.320049+0.507052I$	$-0.238421-1.266880I$	$-2.42303+5.08329I$
$u=-0.092432+1.311290I$ $a=\ \ 0.14750-1.68723I$ $b=\ \ 0.688190+0.376073I$	$-6.50773-1.47983I$	$-9.20328+4.48160I$
$u=-0.092432-1.311290I$ $a=\ \ 0.14750+1.68723I$ $b=\ \ 0.688190-0.376073I$	$-6.50773+1.47983I$	$-9.20328-4.48160I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.366037 + 1.277380I$ $a = 1.32644 - 1.19862I$ $b = 1.025390 + 0.488331I$	$-1.99066 - 8.34590I$	$-7.38920 + 8.20539I$
$u = -0.366037 - 1.277380I$ $a = 1.32644 + 1.19862I$ $b = 1.025390 - 0.488331I$	$-1.99066 + 8.34590I$	$-7.38920 - 8.20539I$
$u = -0.669684 + 0.020164I$ $a = -0.022217 + 1.347390I$ $b = -0.937251 - 0.595896I$	$1.98177 - 4.45651I$	$-1.06472 + 6.47147I$
$u = -0.669684 - 0.020164I$ $a = -0.022217 - 1.347390I$ $b = -0.937251 + 0.595896I$	$1.98177 + 4.45651I$	$-1.06472 - 6.47147I$
$u = -0.618417 + 1.229390I$ $a = 0.511319 - 0.554883I$ $b = -0.923330 + 0.927636I$	$8.97672 + 1.36657I$	$-4.00000 + 0.I$
$u = -0.618417 - 1.229390I$ $a = 0.511319 + 0.554883I$ $b = -0.923330 - 0.927636I$	$8.97672 - 1.36657I$	$-4.00000 + 0.I$
$u = 0.590971 + 1.277150I$ $a = -0.48725 - 1.50500I$ $b = -0.961686 + 0.907689I$	$8.85183 + 5.38651I$	0
$u = 0.590971 - 1.277150I$ $a = -0.48725 + 1.50500I$ $b = -0.961686 - 0.907689I$	$8.85183 - 5.38651I$	0
$u = 0.02483 + 1.43079I$ $a = 0.637356 + 0.570357I$ $b = 0.863543 - 0.756976I$	$-1.89195 + 2.85204I$	$-4.00000 + 0.I$
$u = 0.02483 - 1.43079I$ $a = 0.637356 - 0.570357I$ $b = 0.863543 + 0.756976I$	$-1.89195 - 2.85204I$	$-4.00000 + 0.I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.03651 + 1.47301I$ $a = -1.199870 + 0.246838I$ $b = -0.661912 + 0.244654I$	$-7.07448 + 0.98863I$	0
$u = -0.03651 - 1.47301I$ $a = -1.199870 - 0.246838I$ $b = -0.661912 - 0.244654I$	$-7.07448 - 0.98863I$	0
$u = 0.50808 + 1.40664I$ $a = 0.592702 + 0.296009I$ $b = -0.857340 - 0.944975I$	$7.77909 + 6.04150I$	0
$u = 0.50808 - 1.40664I$ $a = 0.592702 - 0.296009I$ $b = -0.857340 + 0.944975I$	$7.77909 - 6.04150I$	0
$u = -0.48076 + 1.42977I$ $a = -0.81361 + 1.56632I$ $b = -1.004820 - 0.868136I$	$7.2987 - 12.7112I$	0
$u = -0.48076 - 1.42977I$ $a = -0.81361 - 1.56632I$ $b = -1.004820 + 0.868136I$	$7.2987 + 12.7112I$	0
$u = -0.406334$ $a = 0.579971$ $b = 0.878349$	-1.62488	-3.64530
$u = -0.328792$ $a = 4.54970$ $b = -0.587341$	-2.40058	5.69880

II. $\boldsymbol{I_2^u = \langle 4a^2u + 2a^2 + 9b - 9,\ 4a^3 + 4au - 2a - 5u - 2,\ u^2 + 2\rangle}$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a \\ -\frac{4}{9}a^2u - \frac{2}{9}a^2 + 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} \frac{4}{9}a^2u + \frac{2}{9}a^2 + a - 1 \\ -\frac{4}{9}a^2u - \frac{2}{9}a^2 + 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{2}u \\ \frac{4}{9}a^2u + \frac{2}{9}a^2 + \frac{1}{3}au + \frac{2}{3}a - 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u \\ \frac{4}{9}a^2u + \frac{1}{3}au + \cdots + \frac{2}{3}a - 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{1}{2}u \\ \frac{4}{9}a^2u + \frac{2}{9}a^2 + \frac{1}{3}au + \frac{2}{3}a - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{1}{9}a^2u - \frac{1}{3}au + \cdots + \frac{1}{3}a - 1 \\ \frac{1}{3}au + \frac{2}{3}a + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{16}{9}a^2u - \frac{8}{9}a^2 - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.414210I$ $a = 0.264767 - 1.030640I$ $b = 0.877439 + 0.744862I$	$-3.55561 - 2.82812I$	$-8.49024 + 2.97945I$
$u = 1.414210I$ $a = 1.059950 + 0.093921I$ $b = 0.877439 - 0.744862I$	$-3.55561 + 2.82812I$	$-8.49024 - 2.97945I$
$u = 1.414210I$ $a = -1.32472 + 0.93672I$ $b = -0.754878$	-7.69319	$-15.0195 + 0.I$
$u = -1.414210I$ $a = 0.264767 + 1.030640I$ $b = 0.877439 - 0.744862I$	$-3.55561 + 2.82812I$	$-8.49024 - 2.97945I$
$u = -1.414210I$ $a = 1.059950 - 0.093921I$ $b = 0.877439 + 0.744862I$	$-3.55561 - 2.82812I$	$-8.49024 + 2.97945I$
$u = -1.414210I$ $a = -1.32472 - 0.93672I$ $b = -0.754878$	-7.69319	$-15.0195 + 0.I$

III. $I_1^v = \langle a,\ b+v+1,\ v^3+2v^2+v+1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = -0.122561 + 0.744862I$ $a = 0$ $b = -0.877439 - 0.744862I$	$1.37919 - 2.82812I$	$-0.08593 + 2.22005I$
$v = -0.122561 - 0.744862I$ $a = 0$ $b = -0.877439 + 0.744862I$	$1.37919 + 2.82812I$	$-0.08593 - 2.22005I$
$v = -1.75488$ $a = 0$ $b = 0.754878$	-2.75839	-17.8280

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^{38}+10u^{37}+\cdots-24u+1)$
c_2	$((u-1)^3)(u+1)^6(u^{38}+4u^{37}+\cdots+4u-1)$
c_3	$u^3(u^2+2)^3(u^{38}-u^{37}+\cdots-16u+8)$
c_4, c_7, c_8	$u^3(u^2+2)^3(u^{38}+u^{37}+\cdots+48u+8)$
c_5	$((u-1)^6)(u+1)^3(u^{38}+4u^{37}+\cdots+4u-1)$
c_6	$((u^3-u^2+1)^2)(u^3+u^2-1)(u^{38}-2u^{37}+\cdots+u-3)$
c_9	$((u^3-u^2+2u-1)^2)(u^3+u^2+2u+1)(u^{38}+2u^{37}+\cdots-3029u-7419)$
c_{10}	$((u^3-u^2+2u-1)^3)(u^{38}+8u^{37}+\cdots+85u+9)$
c_{11}	$(u^3-u^2+1)(u^3+u^2-1)^2(u^{38}-2u^{37}+\cdots+u-3)$
c_{12}	$((u^3+u^2+2u+1)^3)(u^{38}+8u^{37}+\cdots+85u+9)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^{38}+46y^{37}+\cdots+1128y+1)$
c_2, c_5	$((y-1)^9)(y^{38}-10y^{37}+\cdots+24y+1)$
c_3	$y^3(y+2)^6(y^{38}-53y^{37}+\cdots+896y+64)$
c_4, c_7, c_8	$y^3(y+2)^6(y^{38}+31y^{37}+\cdots-512y+64)$
c_6, c_{11}	$((y^3-y^2+2y-1)^3)(y^{38}-8y^{37}+\cdots-85y+9)$
c_9	$(y^3+3y^2+2y-1)^3$ $\cdot(y^{38}+120y^{37}+\cdots-2146915177y+55041561)$
c_{10}, c_{12}	$((y^3+3y^2+2y-1)^3)(y^{38}+48y^{37}+\cdots+1091y+81)$