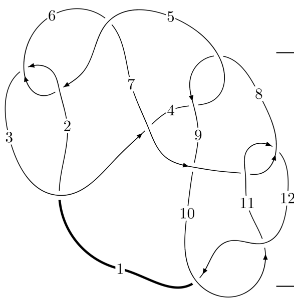
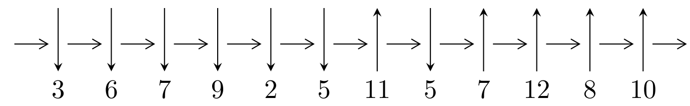
$12n_{0288}$ $(K12n_{0288})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned} I_1^u = \langle & 7.99341 \times 10^{39} u^{32} - 1.73952 \times 10^{40} u^{31} + \cdots + 6.21714 \times 10^{42} b - 7.27832 \times 10^{42}, \\ & -2.58634 \times 10^{40} u^{32} + 4.38348 \times 10^{40} u^{31} + \cdots + 1.24343 \times 10^{43} a - 5.01178 \times 10^{42}, \\ & u^{33} - u^{32} + \cdots + 1024u + 512 \rangle \end{aligned}$$

$$I_1^v = \langle a,\ 3v^5 + 2v^4 + 15v^3 + 20v^2 + 7b + 12v - 3,\ v^6 + v^5 + 5v^4 + 9v^3 + 5v^2 + v + 1 \rangle$$
$$I_2^v = \langle a,\ b^3 - b^2 + 1,\ v - 1 \rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 42 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. $\boldsymbol{I_1^u = \langle 7.99 \times 10^{39} u^{32} - 1.74 \times 10^{40} u^{31} + \cdots + 6.22 \times 10^{42} b - 7.28 \times 10^{42},\ -2.59 \times 10^{40} u^{32} + 4.38 \times 10^{40} u^{31} + \cdots + 1.24 \times 10^{43} a - 5.01 \times 10^{42},\ u^{33} - u^{32} + \cdots + 1024 u + 512 \rangle}$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} 0.00208001u^{32} - 0.00352532u^{31} + \cdots + 1.78233u + 0.403062 \\ -0.00128571u^{32} + 0.00279794u^{31} + \cdots + 1.28986u + 1.17069 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.000794299u^{32} - 0.000727383u^{31} + \cdots + 3.07219u + 1.57375 \\ -0.00128571u^{32} + 0.00279794u^{31} + \cdots + 1.28986u + 1.17069 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -0.00110615u^{32} + 0.00221831u^{31} + \cdots + 0.260315u + 0.865237 \\ 0.00241977u^{32} - 0.00321235u^{31} + \cdots + 4.09026u + 0.856393 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.00164230u^{32} - 0.00102508u^{31} + \cdots + 3.66559u + 0.647992 \\ -0.000789549u^{32} + 0.00155917u^{31} + \cdots + 1.76057u + 0.378455 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.00110615u^{32} + 0.00221831u^{31} + \cdots + 0.260315u + 0.865237 \\ 0.00119835u^{32} - 0.0000262335u^{31} + \cdots + 4.66276u + 1.42582 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.00204624u^{32} - 0.0000326376u^{31} + \cdots + 6.09887u + 1.29264 \\ -0.000664888u^{32} + 0.00290411u^{31} + \cdots + 4.32183u + 1.50071 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.00230450u^{32} - 0.00224455u^{31} + \cdots + 4.40244u + 0.560582 \\ 0.00119835u^{32} - 0.0000262335u^{31} + \cdots + 4.66276u + 1.42582 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.000739170u^{32} - 0.0000503781u^{31} + \cdots - 1.45933u + 1.00366 \\ -0.00132594u^{32} + 0.00245141u^{31} + \cdots - 0.697988u + 1.25243 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -0.0223829u^{32} + 0.0292513u^{31} + \cdots - 14.9362u - 3.65393$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_6	$u^{33} + 6u^{32} + \cdots + 2u + 1$
c_2, c_5	$u^{33} + 4u^{32} + \cdots + 2u + 1$
c_3	$u^{33} - 4u^{32} + \cdots + 77426u + 5953$
c_4, c_8	$u^{33} - u^{32} + \cdots + 1024u + 512$
c_7, c_{11}	$u^{33} - 4u^{32} + \cdots + 2u + 1$
c_9	$u^{33} + 4u^{32} + \cdots - 18u + 1$
c_{10}, c_{12}	$u^{33} - 14u^{32} + \cdots + 50u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{33} + 46y^{32} + \cdots + 66y - 1$
c_2, c_5	$y^{33} - 6y^{32} + \cdots + 2y - 1$
c_3	$y^{33} + 130y^{32} + \cdots + 1530880802y - 35438209$
c_4, c_8	$y^{33} + 49y^{32} + \cdots - 917504y - 262144$
c_7, c_{11}	$y^{33} - 14y^{32} + \cdots + 50y - 1$
c_9	$y^{33} - 70y^{32} + \cdots + 290y - 1$
c_{10}, c_{12}	$y^{33} + 14y^{32} + \cdots + 1938y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.259194 + 0.938083I$ $a = 1.296390 - 0.418631I$ $b = -0.842802 + 0.497518I$	$-1.68399 - 2.04132I$	$-4.24848 + 3.69259I$
$u = -0.259194 - 0.938083I$ $a = 1.296390 + 0.418631I$ $b = -0.842802 - 0.497518I$	$-1.68399 + 2.04132I$	$-4.24848 - 3.69259I$
$u = -0.299553 + 0.982584I$ $a = 0.491758 - 0.071067I$ $b = -0.276643 - 0.578301I$	$1.95211 + 1.67358I$	$-0.85105 - 3.68739I$
$u = -0.299553 - 0.982584I$ $a = 0.491758 + 0.071067I$ $b = -0.276643 + 0.578301I$	$1.95211 - 1.67358I$	$-0.85105 + 3.68739I$
$u = -0.819751 + 0.642390I$ $a = -1.19497 + 1.76483I$ $b = 0.940469 + 0.288411I$	$4.57287 - 1.92834I$	$2.42456 - 1.90294I$
$u = -0.819751 - 0.642390I$ $a = -1.19497 - 1.76483I$ $b = 0.940469 - 0.288411I$	$4.57287 + 1.92834I$	$2.42456 + 1.90294I$
$u = 0.906320 + 0.161254I$ $a = -0.342325 + 1.004680I$ $b = 0.936395 + 0.663389I$	$-1.64047 + 4.33466I$	$-2.39244 - 5.76520I$
$u = 0.906320 - 0.161254I$ $a = -0.342325 - 1.004680I$ $b = 0.936395 - 0.663389I$	$-1.64047 - 4.33466I$	$-2.39244 + 5.76520I$
$u = -0.138715 + 1.076100I$ $a = 0.343138 - 0.314662I$ $b = -0.540873 + 0.646097I$	$0.99056 + 3.01055I$	$-2.29192 - 3.36152I$
$u = -0.138715 - 1.076100I$ $a = 0.343138 + 0.314662I$ $b = -0.540873 - 0.646097I$	$0.99056 - 3.01055I$	$-2.29192 + 3.36152I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.820423 + 0.241734I$ $a = -0.127283 + 1.097200I$ $b = 0.790989 + 0.648302I$	$-2.09854 + 0.79204I$	$-4.42932 + 0.29217I$
$u = -0.820423 - 0.241734I$ $a = -0.127283 - 1.097200I$ $b = 0.790989 - 0.648302I$	$-2.09854 - 0.79204I$	$-4.42932 - 0.29217I$
$u = 0.588887 + 0.452734I$ $a = 1.005150 + 0.039063I$ $b = -0.876518 - 0.152706I$	$1.49526 + 0.33133I$	$5.50598 - 0.36289I$
$u = 0.588887 - 0.452734I$ $a = 1.005150 - 0.039063I$ $b = -0.876518 + 0.152706I$	$1.49526 - 0.33133I$	$5.50598 + 0.36289I$
$u = 1.103600 + 0.681610I$ $a = -1.01014 - 1.30375I$ $b = 1.017310 - 0.360748I$	$5.11059 - 4.16082I$	$2.72191 + 5.85960I$
$u = 1.103600 - 0.681610I$ $a = -1.01014 + 1.30375I$ $b = 1.017310 + 0.360748I$	$5.11059 + 4.16082I$	$2.72191 - 5.85960I$
$u = -0.020434 + 1.399020I$ $a = 1.58993 + 0.37908I$ $b = -1.035370 + 0.580512I$	$2.46612 - 7.83728I$	$0.08663 + 7.57867I$
$u = -0.020434 - 1.399020I$ $a = 1.58993 - 0.37908I$ $b = -1.035370 - 0.580512I$	$2.46612 + 7.83728I$	$0.08663 - 7.57867I$
$u = -0.023074 + 0.498558I$ $a = -0.216617 + 0.905947I$ $b = 0.878924 + 0.769382I$	$-3.74171 + 2.90167I$	$6.31914 - 4.62545I$
$u = -0.023074 - 0.498558I$ $a = -0.216617 - 0.905947I$ $b = 0.878924 - 0.769382I$	$-3.74171 - 2.90167I$	$6.31914 + 4.62545I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.38369 + 1.47441I$ $a = 1.321050 - 0.219840I$ $b = -1.068020 - 0.492605I$	$4.14146 + 2.52091I$	$3.12902 - 2.10165I$
$u = 0.38369 - 1.47441I$ $a = 1.321050 + 0.219840I$ $b = -1.068020 + 0.492605I$	$4.14146 - 2.52091I$	$3.12902 + 2.10165I$
$u = -0.379202$ $a = 1.20462$ $b = 0.150542$	-0.908337	-11.6530
$u = -0.43213 + 1.91828I$ $a = -0.064840 + 0.127886I$ $b = -0.511933 + 0.957121I$	$11.27410 + 6.04297I$	0
$u = -0.43213 - 1.91828I$ $a = -0.064840 - 0.127886I$ $b = -0.511933 - 0.957121I$	$11.27410 - 6.04297I$	0
$u = 0.27574 + 1.97448I$ $a = -0.016267 - 0.141101I$ $b = -0.473285 - 0.959466I$	$11.52690 + 0.81316I$	0
$u = 0.27574 - 1.97448I$ $a = -0.016267 + 0.141101I$ $b = -0.473285 + 0.959466I$	$11.52690 - 0.81316I$	0
$u = 0.66557 + 1.97108I$ $a = 1.118020 + 0.848015I$ $b = -1.143380 + 0.700941I$	$13.2296 - 12.1129I$	0
$u = 0.66557 - 1.97108I$ $a = 1.118020 - 0.848015I$ $b = -1.143380 - 0.700941I$	$13.2296 + 12.1129I$	0
$u = -0.53201 + 2.07441I$ $a = 1.114790 - 0.764503I$ $b = -1.158540 - 0.681377I$	$13.6520 + 5.1893I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.53201 - 2.07441I$ $a = 1.114790 + 0.764503I$ $b = -1.158540 + 0.681377I$	$13.6520 - 5.1893I$	0
$u = 0.11108 + 2.30479I$ $a = -1.410100 - 0.047794I$ $b = 1.288010 - 0.018877I$	$18.1642 - 3.5486I$	0
$u = 0.11108 - 2.30479I$ $a = -1.410100 + 0.047794I$ $b = 1.288010 + 0.018877I$	$18.1642 + 3.5486I$	0

II.

$\boldsymbol{I_1^v = \langle a,\ 3v^5+2v^4+15v^3+20v^2+7b+12v-3,\ v^6+v^5+5v^4+9v^3+5v^2+v+1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ -\frac{3}{7}v^5 - \frac{2}{7}v^4 + \cdots - \frac{12}{7}v + \frac{3}{7} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{3}{7}v^5 - \frac{2}{7}v^4 + \cdots - \frac{12}{7}v + \frac{3}{7} \\ -\frac{3}{7}v^5 - \frac{2}{7}v^4 + \cdots - \frac{12}{7}v + \frac{3}{7} \end{pmatrix}$$
$$a_4 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ -\frac{5}{7}v^5 - \frac{3}{7}v^4 + \cdots - 3v - \frac{4}{7} \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -\frac{2}{7}v^5 + \frac{1}{7}v^4 + \cdots + \frac{6}{7}v - \frac{5}{7} \\ -\frac{1}{7}v^5 + \frac{1}{7}v^4 + \cdots + \frac{12}{7}v - \frac{2}{7} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{3}{7}v^5 - 2v^3 + \cdots + \frac{3}{7}v + \frac{5}{7} \\ -\frac{5}{7}v^5 - \frac{3}{7}v^4 + \cdots - 3v - \frac{4}{7} \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{7}v^5 + \frac{2}{7}v^4 + \cdots + \frac{2}{7}v - \frac{8}{7} \\ \frac{1}{7}v^5 + \frac{5}{7}v^4 + \cdots + \frac{26}{7}v + \frac{1}{7} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -1 \\ \frac{5}{7}v^5 + \frac{3}{7}v^4 + \cdots + 3v + \frac{4}{7} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{5}{7}v^5 + \frac{3}{7}v^4 + \cdots + 3v + \frac{11}{7} \\ \frac{2}{7}v^5 + \frac{1}{7}v^4 + \cdots + \frac{9}{7}v + 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 5v^5 + \frac{12}{7}v^4 + \frac{160}{7}v^3 + \frac{199}{7}v^2 + \frac{20}{7}v - \frac{58}{7}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = -0.947279 + 0.320410I$ $a = 0$ $b = 0.877439 - 0.744862I$	$-5.65624I$	$-0.41065 + 5.95889I$
$v = -0.947279 - 0.320410I$ $a = 0$ $b = 0.877439 + 0.744862I$	$5.65624I$	$-0.41065 - 5.95889I$
$v = 0.069840 + 0.424452I$ $a = 0$ $b = 0.877439 - 0.744862I$	$-4.13758 - 2.82812I$	$-13.82394 + 1.30714I$
$v = 0.069840 - 0.424452I$ $a = 0$ $b = 0.877439 + 0.744862I$	$-4.13758 + 2.82812I$	$-13.82394 - 1.30714I$
$v = 0.37744 + 2.29387I$ $a = 0$ $b = -0.754878$	$4.13758 - 2.82812I$	$-0.76541 + 4.65175I$
$v = 0.37744 - 2.29387I$ $a = 0$ $b = -0.754878$	$4.13758 + 2.82812I$	$-0.76541 - 4.65175I$

III. $I_2^v = \langle a,\ b^3 - b^2 + 1,\ v - 1 \rangle$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} 0 \\ b \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} b \\ b \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

$$a_2 = \begin{pmatrix} b \\ b \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} -b^2 + 1 \\ -b^2 + b + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v = 1.00000$ $a = 0$ $b = 0.877439 + 0.744862I$	0	0
$v = 1.00000$ $a = 0$ $b = 0.877439 - 0.744862I$	0	0
$v = 1.00000$ $a = 0$ $b = -0.754878$	0	0

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^3 - u^2 + 2u - 1)^3)(u^{33} + 6u^{32} + \cdots + 2u + 1)$
c_2	$((u^3 + u^2 - 1)^3)(u^{33} + 4u^{32} + \cdots + 2u + 1)$
c_3	$((u^3 - u^2 + 2u - 1)^3)(u^{33} - 4u^{32} + \cdots + 77426u + 5953)$
c_4, c_8	$u^9(u^{33} - u^{32} + \cdots + 1024u + 512)$
c_5	$((u^3 - u^2 + 1)^3)(u^{33} + 4u^{32} + \cdots + 2u + 1)$
c_6	$((u^3 + u^2 + 2u + 1)^3)(u^{33} + 6u^{32} + \cdots + 2u + 1)$
c_7	$((u^3 - u^2 + 1)^3)(u^{33} - 4u^{32} + \cdots + 2u + 1)$
c_9	$((u^3 - u^2 + 2u - 1)^3)(u^{33} + 4u^{32} + \cdots - 18u + 1)$
c_{10}	$((u^3 + u^2 + 2u + 1)^3)(u^{33} - 14u^{32} + \cdots + 50u - 1)$
c_{11}	$((u^3 + u^2 - 1)^3)(u^{33} - 4u^{32} + \cdots + 2u + 1)$
c_{12}	$((u^3 - u^2 + 2u - 1)^3)(u^{33} - 14u^{32} + \cdots + 50u - 1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_6	$((y^3+3y^2+2y-1)^3)(y^{33}+46y^{32}+\cdots+66y-1)$
c_2, c_5	$((y^3-y^2+2y-1)^3)(y^{33}-6y^{32}+\cdots+2y-1)$
c_3	$(y^3+3y^2+2y-1)^3$ $\cdot\,(y^{33}+130y^{32}+\cdots+1530880802y-35438209)$
c_4, c_8	$y^9(y^{33}+49y^{32}+\cdots-917504y-262144)$
c_7, c_{11}	$((y^3-y^2+2y-1)^3)(y^{33}-14y^{32}+\cdots+50y-1)$
c_9	$((y^3+3y^2+2y-1)^3)(y^{33}-70y^{32}+\cdots+290y-1)$
c_{10}, c_{12}	$((y^3+3y^2+2y-1)^3)(y^{33}+14y^{32}+\cdots+1938y-1)$