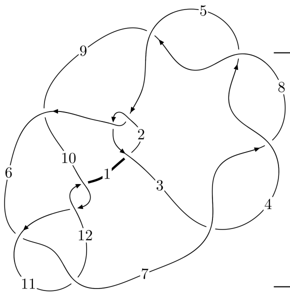
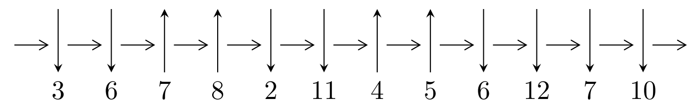
$12n_{0340}$ ($K12n_{0340}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -62822499u^{16} + 98950048u^{15} + \cdots + 179809420b + 1255421292,$$
$$75505587u^{16} - 95682099u^{15} + \cdots + 179809420a - 2254628556,\ u^{17} - u^{16} + \cdots - 40u - 8\rangle$$
$$I_2^u = \langle 2a^2 + 2au + 5b + 4a + 1,\ 4a^3 + 4a^2 - 2au + 6a - 7u + 8,\ u^2 - 2\rangle$$

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

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 26 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.

$$\boldsymbol{I_1^u = \langle -6.28\times 10^{7}u^{16} + 9.90\times 10^{7}u^{15} + \cdots + 1.80\times 10^{8}b + 1.26\times 10^{9},\ 7.55\times 10^{7}u^{16} - 9.57\times 10^{7}u^{15} + \cdots + 1.80\times 10^{8}a - 2.25\times 10^{9},\ u^{17} - u^{16} + \cdots - 40u - 8\rangle}$$

(i) Arc colorings

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

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

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

$$a_5 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} -0.419920u^{16} + 0.532131u^{15} + \cdots + 20.6991u + 12.5390 \\ 0.349384u^{16} - 0.550305u^{15} + \cdots - 19.0383u - 6.98196 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.769304u^{16} + 1.08244u^{15} + \cdots + 39.7373u + 19.5209 \\ 0.349384u^{16} - 0.550305u^{15} + \cdots - 19.0383u - 6.98196 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -0.706889u^{16} + 0.968606u^{15} + \cdots + 35.6654u + 16.9023 \\ -0.0874591u^{16} + 0.0795210u^{15} + \cdots + 3.47438u + 1.11299 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.706889u^{16} - 0.968606u^{15} + \cdots - 35.6654u - 16.9023 \\ -0.159634u^{16} + 0.215306u^{15} + \cdots + 8.28792u + 3.20672 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.796542u^{16} - 1.07340u^{15} + \cdots - 39.5291u - 18.5507 \\ -0.249287u^{16} + 0.320105u^{15} + \cdots + 12.1516u + 4.85508 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.267792u^{16} + 0.361424u^{15} + \cdots + 13.1869u + 7.51366 \\ 0.153138u^{16} - 0.238805u^{15} + \cdots - 8.95604u - 3.24946 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{54399547}{25687060}u^{16} + \frac{11504827}{3669580}u^{15} + \cdots + \frac{93333338}{917395}u + \frac{275633814}{6421765}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{17} - 4u^{16} + \cdots + 3757u + 529$
c_2, c_5	$u^{17} + 4u^{16} + \cdots - 59u + 23$
c_3, c_4, c_7 c_8	$u^{17} - u^{16} + \cdots - 40u - 8$
c_6, c_{11}	$u^{17} - 2u^{16} + \cdots - 4u + 1$
c_9	$u^{17} + 2u^{16} + \cdots - 284u + 1429$
c_{10}, c_{12}	$u^{17} + 2u^{16} + \cdots + 10u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{17} + 60y^{16} + \cdots + 3317101y - 279841$
c_2, c_5	$y^{17} + 4y^{16} + \cdots + 3757y - 529$
c_3, c_4, c_7 c_8	$y^{17} - 31y^{16} + \cdots + 960y - 64$
c_6, c_{11}	$y^{17} - 2y^{16} + \cdots + 10y - 1$
c_9	$y^{17} + 102y^{16} + \cdots + 30338302y - 2042041$
c_{10}, c_{12}	$y^{17} + 30y^{16} + \cdots + 34y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.030470 + 0.189629I$ $a = -0.224345 - 0.523213I$ $b = -0.453303 + 0.618424I$	$2.71496 + 0.03038I$	$1.85613 - 0.36758I$
$u = 1.030470 - 0.189629I$ $a = -0.224345 + 0.523213I$ $b = -0.453303 - 0.618424I$	$2.71496 - 0.03038I$	$1.85613 + 0.36758I$
$u = -0.761878 + 0.176219I$ $a = -0.973738 + 0.882302I$ $b = -0.880524 - 0.587541I$	$1.72734 - 4.32421I$	$-0.54590 + 7.81400I$
$u = -0.761878 - 0.176219I$ $a = -0.973738 - 0.882302I$ $b = -0.880524 + 0.587541I$	$1.72734 + 4.32421I$	$-0.54590 - 7.81400I$
$u = 1.35959$ $a = -0.625953$ $b = -0.396497$	3.15281	3.23020
$u = -0.013551 + 0.593749I$ $a = 0.794033 - 0.406646I$ $b = 0.490534 - 0.506411I$	$-0.43270 + 1.37617I$	$-3.71871 - 4.10562I$
$u = -0.013551 - 0.593749I$ $a = 0.794033 + 0.406646I$ $b = 0.490534 + 0.506411I$	$-0.43270 - 1.37617I$	$-3.71871 + 4.10562I$
$u = -0.456807$ $a = 1.47926$ $b = 0.882527$	-1.65919	-3.40410
$u = -0.340015$ $a = 4.30114$ $b = -0.599895$	-2.41310	6.57470
$u = 1.70987 + 0.34907I$ $a = -0.035901 - 0.854639I$ $b = 1.105810 + 0.797473I$	$10.32630 - 2.94049I$	$0.85532 + 2.11383I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.70987 - 0.34907I$ $a = -0.035901 + 0.854639I$ $b = 1.105810 - 0.797473I$	$10.32630 + 2.94049I$	$0.85532 - 2.11383I$
$u = -1.64126 + 0.59755I$ $a = 0.137352 - 1.120570I$ $b = 0.823579 + 1.043060I$	$11.40790 - 3.91728I$	$1.42724 + 2.75158I$
$u = -1.64126 - 0.59755I$ $a = 0.137352 + 1.120570I$ $b = 0.823579 - 1.043060I$	$11.40790 + 3.91728I$	$1.42724 - 2.75158I$
$u = 1.96918 + 0.29196I$ $a = -0.119407 - 1.324750I$ $b = -1.10155 + 0.95457I$	$-15.4344 + 9.3275I$	$0.15944 - 3.93386I$
$u = 1.96918 - 0.29196I$ $a = -0.119407 + 1.324750I$ $b = -1.10155 - 0.95457I$	$-15.4344 - 9.3275I$	$0.15944 + 3.93386I$
$u = -2.07422 + 0.20650I$ $a = 0.344781 - 0.929300I$ $b = -0.92761 + 1.10685I$	$-14.7845 - 1.8072I$	$0.766090 - 0.113701I$
$u = -2.07422 - 0.20650I$ $a = 0.344781 + 0.929300I$ $b = -0.92761 - 1.10685I$	$-14.7845 + 1.8072I$	$0.766090 + 0.113701I$

II. $\boldsymbol{I_2^u = \langle 2a^2 + 2au + 5b + 4a + 1,\ 4a^3 + 4a^2 - 2au + 6a - 7u + 8,\ u^2 - 2\rangle}$

(i) Arc colorings

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

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

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

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

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

$$a_{11} = \begin{pmatrix} a \\ -\frac{2}{5}a^2 - \frac{2}{5}au - \frac{4}{5}a - \frac{1}{5} \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} \frac{2}{5}a^2 + \frac{2}{5}au + \frac{9}{5}a + \frac{1}{5} \\ -\frac{2}{5}a^2 - \frac{2}{5}au - \frac{4}{5}a - \frac{1}{5} \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} \frac{2}{5}a^2u + \frac{1}{5}au + \cdots - \frac{2}{5}a + \frac{1}{5} \\ -\frac{2}{5}a^2u - \frac{1}{5}au + \cdots + \frac{2}{5}a - \frac{1}{5} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{2}{5}a^2u + \frac{1}{5}au + \cdots - \frac{2}{5}a + \frac{1}{5} \\ -\frac{2}{5}a^2u - \frac{1}{5}au + \cdots + \frac{2}{5}a - \frac{1}{5} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} \frac{2}{5}a^2u + \frac{1}{5}au + \cdots - \frac{2}{5}a + \frac{1}{5} \\ -\frac{2}{5}a^2u - \frac{1}{5}au + \cdots + \frac{2}{5}a - \frac{1}{5} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{3}{5}a^2u + \frac{2}{5}au + \cdots + \frac{3}{5}a - \frac{7}{5} \\ -\frac{2}{5}a^2u - \frac{3}{5}au + \cdots - \frac{2}{5}a + \frac{3}{5} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{8}{5}a^2 - \frac{8}{5}au - \frac{16}{5}a - \frac{24}{5}$

(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
$u = 1.41421$ $a = -0.683438 + 0.909550I$ $b = 0.877439 - 0.744862I$	$6.31400 + 2.82812I$	$-0.49024 - 2.97945I$
$u = 1.41421$ $a = -0.683438 - 0.909550I$ $b = 0.877439 + 0.744862I$	$6.31400 - 2.82812I$	$-0.49024 + 2.97945I$
$u = 1.41421$ $a = 0.366877$ $b = -0.754878$	2.17641	-7.01950
$u = -1.41421$ $a = -1.50656$ $b = -0.754878$	2.17641	-7.01950
$u = -1.41421$ $a = 0.25328 + 1.70473I$ $b = 0.877439 - 0.744862I$	$6.31400 + 2.82812I$	$-0.49024 - 2.97945I$
$u = -1.41421$ $a = 0.25328 - 1.70473I$ $b = 0.877439 + 0.744862I$	$6.31400 - 2.82812I$	$-0.49024 + 2.97945I$

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

(i) Arc colorings

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

(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	$((u-1)^9)(u^{17}-4u^{16}+\cdots+3757u+529)$
c_2	$((u-1)^3)(u+1)^6(u^{17}+4u^{16}+\cdots-59u+23)$
c_3, c_4, c_7 c_8	$u^3(u^2-2)^3(u^{17}-u^{16}+\cdots-40u-8)$
c_5	$((u-1)^6)(u+1)^3(u^{17}+4u^{16}+\cdots-59u+23)$
c_6	$((u^3-u^2+1)^2)(u^3+u^2-1)(u^{17}-2u^{16}+\cdots-4u+1)$
c_9	$((u^3-u^2+2u-1)^2)(u^3+u^2+2u+1)(u^{17}+2u^{16}+\cdots-284u+1429)$
c_{10}	$((u^3-u^2+2u-1)^3)(u^{17}+2u^{16}+\cdots+10u+1)$
c_{11}	$(u^3-u^2+1)(u^3+u^2-1)^2(u^{17}-2u^{16}+\cdots-4u+1)$
c_{12}	$((u^3+u^2+2u+1)^3)(u^{17}+2u^{16}+\cdots+10u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^{17}+60y^{16}+\cdots+3317101y-279841)$
c_2, c_5	$((y-1)^9)(y^{17}+4y^{16}+\cdots+3757y-529)$
c_3, c_4, c_7 c_8	$y^3(y-2)^6(y^{17}-31y^{16}+\cdots+960y-64)$
c_6, c_{11}	$((y^3-y^2+2y-1)^3)(y^{17}-2y^{16}+\cdots+10y-1)$
c_9	$((y^3+3y^2+2y-1)^3)(y^{17}+102y^{16}+\cdots+3.03383\times 10^7 y-2042041)$
c_{10}, c_{12}	$((y^3+3y^2+2y-1)^3)(y^{17}+30y^{16}+\cdots+34y-1)$