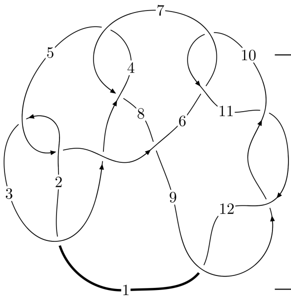
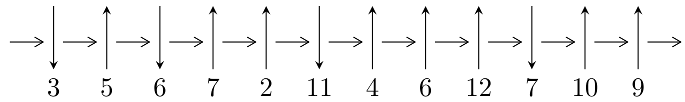
$12n_{0013}$ ($K12n_{0013}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{20} + 2u^{19} + \cdots + 3u^2 + 2b,\ -u^{20} + 2u^{19} + \cdots + 2a + 1,\ u^{22} - 3u^{21} + \cdots - u + 1 \rangle$$
$$I_2^u = \langle -u^3a - 2u^2a - u^3 - au - 2u^2 + 2b - a - u - 1,\ u^2a + u^3 + a^2 + au + u^2 + 2a + u,\ u^4 + u^3 + u^2 + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 30 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. $I^u_1 = \langle -u^{20}+2u^{19}+\cdots+3u^2+2b,\ -u^{20}+2u^{19}+\cdots+2a+1,\ u^{22}-3u^{21}+\cdots-u+1\rangle$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} \frac{1}{2}u^{20} - u^{19} + \cdots + \frac{3}{2}u - \frac{1}{2} \\ \frac{1}{2}u^{20} - u^{19} + \cdots + \frac{3}{2}u^3 - \frac{3}{2}u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^{19} + \frac{5}{2}u^{18} + \cdots - \frac{5}{2}u + \frac{5}{2} \\ -u^{21} + \frac{5}{2}u^{20} + \cdots + \frac{5}{2}u^2 - u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{3}{2}u^{18} - 2u^{17} + \cdots - \frac{3}{2}u + \frac{5}{2} \\ \frac{3}{2}u^{20} - 3u^{19} + \cdots + \frac{5}{2}u^2 - u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{3}{2}u^{20} - 3u^{19} + \cdots - \frac{5}{2}u + \frac{5}{2} \\ \frac{3}{2}u^{20} - 3u^{19} + \cdots + \frac{5}{2}u^2 - u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^7 - 2u^3 \\ -u^9 - u^7 - 3u^5 - 2u^3 - u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^5 + u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^7 - 2u^3 \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= \frac{7}{2}u^{21} - 8u^{20} + \frac{27}{2}u^{19} - \frac{19}{2}u^{18} + 32u^{17} - \frac{99}{2}u^{16} + \frac{163}{2}u^{15} - 45u^{14} + \frac{197}{2}u^{13} - 102u^{12} + \frac{365}{2}u^{11} - \frac{157}{2}u^{10} + \frac{253}{2}u^9 - 58u^8 + 151u^7 - 40u^6 + 53u^5 + \frac{59}{2}u^4 + \frac{23}{2}u^3 + \frac{35}{2}u^2 + \frac{21}{2}u + \frac{17}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{22} + 17u^{21} + \cdots + 31u + 1$
c_2, c_5	$u^{22} + 5u^{21} + \cdots + 7u + 1$
c_3	$u^{22} - 5u^{21} + \cdots + 5u + 1$
c_4, c_7	$u^{22} + u^{21} + \cdots - 640u + 256$
c_6, c_{10}	$u^{22} + 3u^{21} + \cdots + u + 1$
c_8	$u^{22} + 3u^{21} + \cdots - 2455u + 2425$
c_9, c_{11}, c_{12}	$u^{22} - 3u^{21} + \cdots - 11u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{22} - 19y^{21} + \cdots - 29y + 1$
c_2, c_5	$y^{22} + 17y^{21} + \cdots + 31y + 1$
c_3	$y^{22} - 55y^{21} + \cdots + 143y + 1$
c_4, c_7	$y^{22} + 45y^{21} + \cdots + 344064y + 65536$
c_6, c_{10}	$y^{22} + 3y^{21} + \cdots + 11y + 1$
c_8	$y^{22} + 135y^{21} + \cdots + 316362175y + 5880625$
c_9, c_{11}, c_{12}	$y^{22} + 35y^{21} + \cdots + 11y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.443267 + 0.917989I$ $a = 1.79705 + 0.42952I$ $b = -0.004921 + 1.060270I$	$-1.64918 - 2.09688I$	$0.35789 + 3.47675I$
$u = 0.443267 - 0.917989I$ $a = 1.79705 - 0.42952I$ $b = -0.004921 - 1.060270I$	$-1.64918 + 2.09688I$	$0.35789 - 3.47675I$
$u = 0.720168 + 0.521314I$ $a = -0.12085 - 1.89524I$ $b = 0.210578 - 1.177030I$	$-3.15354 - 2.22003I$	$-2.57059 + 3.13171I$
$u = 0.720168 - 0.521314I$ $a = -0.12085 + 1.89524I$ $b = 0.210578 + 1.177030I$	$-3.15354 + 2.22003I$	$-2.57059 - 3.13171I$
$u = -0.786228 + 0.864892I$ $a = 0.309770 - 0.406841I$ $b = -0.672095 + 0.089076I$	$-5.42259 + 2.92304I$	$0.66405 - 3.09728I$
$u = -0.786228 - 0.864892I$ $a = 0.309770 + 0.406841I$ $b = -0.672095 - 0.089076I$	$-5.42259 - 2.92304I$	$0.66405 + 3.09728I$
$u = -0.948373 + 0.755313I$ $a = -0.16577 + 1.46179I$ $b = -0.211609 + 1.390430I$	$-10.31720 - 0.20205I$	$-2.87081 - 0.56297I$
$u = -0.948373 - 0.755313I$ $a = -0.16577 - 1.46179I$ $b = -0.211609 - 1.390430I$	$-10.31720 + 0.20205I$	$-2.87081 + 0.56297I$
$u = -0.763942 + 1.021840I$ $a = 1.53053 - 1.26261I$ $b = -0.296827 - 1.316550I$	$-9.36150 + 6.49304I$	$-1.80593 - 4.67801I$
$u = -0.763942 - 1.021840I$ $a = 1.53053 + 1.26261I$ $b = -0.296827 + 1.316550I$	$-9.36150 - 6.49304I$	$-1.80593 + 4.67801I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.269873 + 0.669231I$ $a = 0.754251 + 0.193264I$ $b = -0.084971 - 0.208905I$	$0.305023 - 1.133800I$	$3.87062 + 6.16556I$
$u = 0.269873 - 0.669231I$ $a = 0.754251 - 0.193264I$ $b = -0.084971 + 0.208905I$	$0.305023 + 1.133800I$	$3.87062 - 6.16556I$
$u = 0.967508 + 0.974980I$ $a = -0.224218 + 0.619641I$ $b = -1.215960 - 0.024945I$	$-18.0328 - 3.5472I$	$0.60128 + 2.10334I$
$u = 0.967508 - 0.974980I$ $a = -0.224218 - 0.619641I$ $b = -1.215960 + 0.024945I$	$-18.0328 + 3.5472I$	$0.60128 - 2.10334I$
$u = 1.005100 + 0.939078I$ $a = -0.378437 - 1.203500I$ $b = -0.58715 - 1.46073I$	$16.7892 + 2.8754I$	$-1.69600 - 0.52262I$
$u = 1.005100 - 0.939078I$ $a = -0.378437 + 1.203500I$ $b = -0.58715 + 1.46073I$	$16.7892 - 2.8754I$	$-1.69600 + 0.52262I$
$u = 0.948146 + 1.018020I$ $a = 1.14718 + 1.69204I$ $b = -0.61183 + 1.42911I$	$17.0662 - 10.0252I$	$-1.33592 + 4.78932I$
$u = 0.948146 - 1.018020I$ $a = 1.14718 - 1.69204I$ $b = -0.61183 - 1.42911I$	$17.0662 + 10.0252I$	$-1.33592 - 4.78932I$
$u = -0.036441 + 0.595658I$ $a = 0.47769 + 1.42665I$ $b = 0.429450 - 0.716106I$	$0.68417 - 1.38791I$	$7.27307 + 5.07376I$
$u = -0.036441 - 0.595658I$ $a = 0.47769 - 1.42665I$ $b = 0.429450 + 0.716106I$	$0.68417 + 1.38791I$	$7.27307 - 5.07376I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.319079 + 0.434625I$ $a = -2.12719 + 1.76082I$ $b = 0.545330 + 0.947805I$	$-0.06729 + 2.75299I$	$1.012349 - 0.159946I$
$u = -0.319079 - 0.434625I$ $a = -2.12719 - 1.76082I$ $b = 0.545330 - 0.947805I$	$-0.06729 - 2.75299I$	$1.012349 + 0.159946I$

II.

$$\boldsymbol{I_2^u = \langle -u^3a - u^3 + \cdots - a - 1,\ u^2a + u^3 + a^2 + au + u^2 + 2a + u,\ u^4 + u^3 + u^2 + 1\rangle}$$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

$$a_5 = \begin{pmatrix} -\frac{1}{2}u^3a - \frac{1}{2}u^3 + \cdots + \frac{1}{2}a + \frac{3}{2} \\ \frac{1}{2}u^3a + \frac{1}{2}u^3 + \cdots + \frac{1}{2}a - \frac{1}{2} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{2}u^3a - \frac{1}{2}u^3 + \cdots + \frac{1}{2}a + \frac{3}{2} \\ \frac{1}{2}u^3a + \frac{1}{2}u^3 + \cdots + \frac{1}{2}a - \frac{1}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^2 + a + u + 1 \\ \frac{1}{2}u^3a + \frac{1}{2}u^3 + \cdots + \frac{1}{2}a - \frac{1}{2} \end{pmatrix}$$

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

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

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

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

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -u^3a - 3u^2a - 2u^3 - 3au - 3a + u + 2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.351808+0.720342I$ $a = 0.084432-0.576081I$ $b = 0.500000+0.866025I$	$0.211005+0.614778I$	$1.10064+1.99408I$
$u = 0.351808+0.720342I$ $a = -2.04112-0.65111I$ $b = 0.500000-0.866025I$	$0.21101-3.44499I$	$5.86133+9.77094I$
$u = 0.351808-0.720342I$ $a = 0.084432+0.576081I$ $b = 0.500000-0.866025I$	$0.211005-0.614778I$	$1.10064-1.99408I$
$u = 0.351808-0.720342I$ $a = -2.04112+0.65111I$ $b = 0.500000+0.866025I$	$0.21101+3.44499I$	$5.86133-9.77094I$
$u = -0.851808+0.911292I$ $a = 0.033637-0.507913I$ $b = 0.500000-0.866025I$	$-6.79074+1.13408I$	$-1.56110-0.68902I$
$u = -0.851808+0.911292I$ $a = -1.07695+1.14911I$ $b = 0.500000+0.866025I$	$-6.79074+5.19385I$	$-0.90087-4.17049I$
$u = -0.851808-0.911292I$ $a = 0.033637+0.507913I$ $b = 0.500000+0.866025I$	$-6.79074-1.13408I$	$-1.56110+0.68902I$
$u = -0.851808-0.911292I$ $a = -1.07695-1.14911I$ $b = 0.500000-0.866025I$	$-6.79074-5.19385I$	$-0.90087+4.17049I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^4)(u^{22}+17u^{21}+\cdots+31u+1)$
c_2	$((u^2+u+1)^4)(u^{22}+5u^{21}+\cdots+7u+1)$
c_3	$((u^2-u+1)^4)(u^{22}-5u^{21}+\cdots+5u+1)$
c_4, c_7	$u^8(u^{22}+u^{21}+\cdots-640u+256)$
c_5	$((u^2-u+1)^4)(u^{22}+5u^{21}+\cdots+7u+1)$
c_6	$((u^4+u^3+u^2+1)^2)(u^{22}+3u^{21}+\cdots+u+1)$
c_8	$((u^4-u^3+3u^2-2u+1)^2)(u^{22}+3u^{21}+\cdots-2455u+2425)$
c_9	$((u^4+u^3+3u^2+2u+1)^2)(u^{22}-3u^{21}+\cdots-11u+1)$
c_{10}	$((u^4-u^3+u^2+1)^2)(u^{22}+3u^{21}+\cdots+u+1)$
c_{11}, c_{12}	$((u^4-u^3+3u^2-2u+1)^2)(u^{22}-3u^{21}+\cdots-11u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^2+y+1)^4)(y^{22}-19y^{21}+\cdots-29y+1)$
c_2, c_5	$((y^2+y+1)^4)(y^{22}+17y^{21}+\cdots+31y+1)$
c_3	$((y^2+y+1)^4)(y^{22}-55y^{21}+\cdots+143y+1)$
c_4, c_7	$y^8(y^{22}+45y^{21}+\cdots+344064y+65536)$
c_6, c_{10}	$((y^4+y^3+3y^2+2y+1)^2)(y^{22}+3y^{21}+\cdots+11y+1)$
c_8	$(y^4+5y^3+7y^2+2y+1)^2$ $\cdot(y^{22}+135y^{21}+\cdots+316362175y+5880625)$
c_9, c_{11}, c_{12}	$((y^4+5y^3+7y^2+2y+1)^2)(y^{22}+35y^{21}+\cdots+11y+1)$