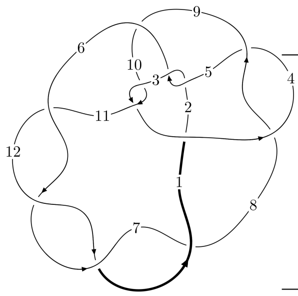
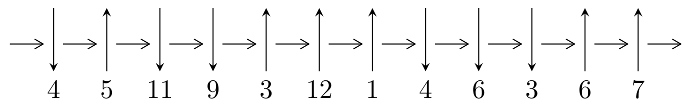
$12n_{0821}$ ($K12n_{0821}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I^u_1 &= \langle 5u^{12} + 17u^{11} - 8u^{10} - 70u^9 - 18u^8 + 113u^7 + 91u^6 - 46u^5 - 122u^4 - 31u^3 + 55u^2 + 2b + 23u + 12,\\
&\quad - 11u^{12} - 36u^{11} + \cdots + 2a - 27,\\
&\quad u^{13} + 5u^{12} + 4u^{11} - 16u^{10} - 26u^9 + 15u^8 + 53u^7 + 22u^6 - 36u^5 - 45u^4 - u^3 + 21u^2 + 10u + 4\rangle\\
I^u_2 &= \langle -u^7 + 5u^5 - u^4 - 7u^3 + 3u^2 + b + 2u - 1,\ u^7 - 5u^5 + u^4 + 7u^3 - 4u^2 + a - 2u + 3,\\
&\quad u^8 - 6u^6 + u^5 + 11u^4 - 4u^3 - 6u^2 + 3u + 1\rangle\\
I^u_3 &= \langle -a^3u^2 - 10a^3u + 2a^2u^2 + 8a^3 - 9a^2u + 16u^2a + 13a^2 - 14au + 19u^2 + 29b - 12a - 13u - 36,\\
&\quad - 2a^3u^2 + a^4 + a^3u + 3a^2u^2 + 4a^3 - a^2u + 12u^2a - 5a^2 - 7au - 27a + u + 1,\ u^3 - u^2 - 2u + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 33 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. $\boldsymbol{I_1^u = \langle 5u^{12} + 17u^{11} + \cdots + 2b + 12,\ -11u^{12} - 36u^{11} + \cdots + 2a - 27,\ u^{13} + 5u^{12} + \cdots + 10u + 4\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{11}{2}u^{12} + 18u^{11} + \cdots + 24u + \frac{27}{2} \\ -\frac{5}{2}u^{12} - \frac{17}{2}u^{11} + \cdots - \frac{23}{2}u - 6 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 3u^{12} + \frac{19}{2}u^{11} + \cdots + \frac{25}{2}u + \frac{15}{2} \\ -\frac{5}{2}u^{12} - \frac{17}{2}u^{11} + \cdots - \frac{23}{2}u - 6 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{11}{4}u^{12} + \frac{37}{4}u^{11} + \cdots + \frac{49}{4}u + 7 \\ -\frac{1}{2}u^{12} - \frac{3}{2}u^{11} + \cdots - \frac{3}{2}u - 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{11}{4}u^{12} - \frac{37}{4}u^{11} + \cdots - \frac{53}{4}u - 6 \\ -\frac{1}{2}u^{12} - \frac{3}{2}u^{11} + \cdots - \frac{3}{2}u - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{1}{4}u^{12} + \frac{3}{4}u^{11} + \cdots - \frac{1}{4}u + 1 \\ \frac{1}{2}u^{12} + \frac{3}{2}u^{11} + \cdots + \frac{3}{2}u + 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{4}u^{12} + \frac{3}{4}u^{11} + \cdots - \frac{1}{4}u + 1 \\ -\frac{1}{2}u^{12} - \frac{3}{2}u^{11} + \cdots - \frac{5}{2}u - 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^3 - 2u \\ -u^5 + 3u^3 - u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -17u^{12} - 55u^{11} + 30u^{10} + 220u^9 + 44u^8 - 346u^7 - 267u^6 + 135u^5 + 358u^4 + 81u^3 - 157u^2 - 56u - 34$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{13} - u^{12} + \cdots + 15u + 1$
c_2, c_5	$u^{13} + 6u^{12} + \cdots + 12u + 8$
c_3, c_4, c_8 c_{10}	$u^{13} - u^{12} + \cdots + u - 1$
c_6, c_7, c_{11} c_{12}	$u^{13} - 5u^{12} + \cdots + 10u - 4$
c_9	$u^{13} + 15u^{11} + \cdots - 15u^2 - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{13} + 39y^{12} + \cdots + 155y - 1$
c_2, c_5	$y^{13} - 14y^{12} + \cdots + 80y - 64$
c_3, c_4, c_8 c_{10}	$y^{13} + 7y^{12} + \cdots - y - 1$
c_6, c_7, c_{11} c_{12}	$y^{13} - 17y^{12} + \cdots - 68y - 16$
c_9	$y^{13} + 30y^{12} + \cdots - 30y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.497615 + 0.876393I$ $a = -0.520432 - 0.143375I$ $b = -0.286884 - 1.048300I$	$5.56724 - 2.86079I$	$6.58762 + 4.73580I$
$u = -0.497615 - 0.876393I$ $a = -0.520432 + 0.143375I$ $b = -0.286884 + 1.048300I$	$5.56724 + 2.86079I$	$6.58762 - 4.73580I$
$u = 0.977918 + 0.258584I$ $a = -0.50072 - 1.42125I$ $b = -0.432880 + 0.770070I$	$3.49671 + 3.30133I$	$5.66986 - 7.29619I$
$u = 0.977918 - 0.258584I$ $a = -0.50072 + 1.42125I$ $b = -0.432880 - 0.770070I$	$3.49671 - 3.30133I$	$5.66986 + 7.29619I$
$u = -1.15240$ $a = -0.0663024$ $b = -0.413299$	2.44636	4.36790
$u = 1.276260 + 0.459752I$ $a = 0.350061 + 1.031200I$ $b = 0.82833 - 1.24672I$	$11.16010 + 7.44705I$	$5.81652 - 5.20775I$
$u = 1.276260 - 0.459752I$ $a = 0.350061 - 1.031200I$ $b = 0.82833 + 1.24672I$	$11.16010 - 7.44705I$	$5.81652 + 5.20775I$
$u = -0.158213 + 0.403429I$ $a = 0.826836 - 0.260199I$ $b = 0.295622 + 0.443698I$	$-0.016018 - 0.973727I$	$-0.21220 + 6.98709I$
$u = -0.158213 - 0.403429I$ $a = 0.826836 + 0.260199I$ $b = 0.295622 - 0.443698I$	$-0.016018 + 0.973727I$	$-0.21220 - 6.98709I$
$u = -1.71570 + 0.06763I$ $a = 0.12881 - 1.62879I$ $b = 0.519770 + 0.949390I$	$13.07970 - 4.61256I$	$6.03428 + 7.03944I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.71570-0.06763I$ $a=\ 0.12881+1.62879I$ $b=\ 0.519770-0.949390I$	$13.07970+4.61256I$	$6.03428-7.03944I$
$u=-1.80645+0.12280I$ $a=\ 0.24859+1.52769I$ $b=-1.21731-1.42694I$	$-17.2391-10.0928I$	$5.92000+4.03274I$
$u=-1.80645-0.12280I$ $a=\ 0.24859-1.52769I$ $b=-1.21731+1.42694I$	$-17.2391+10.0928I$	$5.92000-4.03274I$

II. $\boldsymbol{I^u_2 = \langle -u^7+5u^5-u^4-7u^3+3u^2+b+2u-1,\ u^7-5u^5+u^4+7u^3-4u^2+a-2u+3,\ u^8-6u^6+u^5+11u^4-4u^3-6u^2+3u+1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -3u^7+2u^6+21u^5-12u^4-42u^3+24u^2+17u-10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^8 + 3y^7 - 2y^6 - 30y^5 + 99y^4 - 166y^3 + 131y^2 - 38y + 1$
c_2, c_5	$y^8 - 11y^7 + 55y^6 - 159y^5 + 278y^4 - 281y^3 + 142y^2 - 25y + 1$
c_3, c_4, c_8 c_{10}	$y^8 - 5y^7 + 6y^6 + 2y^5 - y^4 - 6y^3 - y^2 + 2y + 1$
c_6, c_7, c_{11} c_{12}	$y^8 - 12y^7 + 58y^6 - 145y^5 + 203y^4 - 166y^3 + 82y^2 - 21y + 1$
c_9	$y^8 + 2y^7 - y^6 - 6y^5 - y^4 + 2y^3 + 6y^2 - 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.868162$ $a = 0.196614$ $b = -1.44291$	-1.71749	5.61020
$u = 0.733070 + 0.412657I$ $a = -1.46575 - 0.08392I$ $b = -0.167149 + 0.688931I$	$4.59844 + 1.46844I$	$5.92040 - 3.51787I$
$u = 0.733070 - 0.412657I$ $a = -1.46575 + 0.08392I$ $b = -0.167149 - 0.688931I$	$4.59844 - 1.46844I$	$5.92040 + 3.51787I$
$u = 1.35093$ $a = 0.698866$ $b = -0.873848$	1.54653	-4.73980
$u = 1.69498$ $a = -0.701727$ $b = 1.57470$	7.46249	4.83590
$u = -1.69932 + 0.10356I$ $a = 0.446197 - 1.151580I$ $b = 0.430778 + 0.799616I$	$13.38720 - 3.48023I$	$8.31022 + 1.19329I$
$u = -1.69932 - 0.10356I$ $a = 0.446197 + 1.151580I$ $b = 0.430778 - 0.799616I$	$13.38720 + 3.48023I$	$8.31022 - 1.19329I$
$u = -0.245247$ $a = -3.15466$ $b = 1.21480$	-3.78433	-12.1680

III. $\boldsymbol{I^u_3 =}$
$\boldsymbol{\langle -a^3u^2+2a^2u^2+\cdots-12a-36,\ -2a^3u^2+3a^2u^2+\cdots-27a+1,\ u^3-u^2-2u+1\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ -u^2 - u + 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ u^2 + u - 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} a \\ 0.0344828a^3u^2 - 0.0689655a^2u^2 + \cdots + 0.413793a + 1.24138 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.0344828a^3u^2 - 0.0689655a^2u^2 + \cdots + 1.41379a + 1.24138 \\ 0.0344828a^3u^2 - 0.0689655a^2u^2 + \cdots + 0.413793a + 1.24138 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.0344828a^3u^2 - 0.0689655a^2u^2 + \cdots + 1.41379a - 0.758621 \\ 0.379310a^3u^2 - 0.758621a^2u^2 + \cdots + 0.551724a - 0.344828 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.0344828a^3u^2 + 0.0689655a^2u^2 + \cdots - 1.41379a + 0.758621 \\ -0.206897a^3u^2 + 0.413793a^2u^2 + \cdots - 0.482759a + 0.551724 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.0344828a^3u^2 - 0.0689655a^2u^2 + \cdots + 1.41379a - 0.758621 \\ -0.206897a^3u^2 - 0.586207a^2u^2 + \cdots - 0.482759a - 1.44828 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.0344828a^3u^2 - 0.0689655a^2u^2 + \cdots + 1.41379a - 0.758621 \\ -0.379310a^3u^2 - 0.241379a^2u^2 + \cdots - 0.551724a - 1.65517 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^2 - 1 \\ -u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{12} - u^{11} + \cdots - 42u - 1$
c_2, c_5	$(u^2 - u - 1)^6$
c_3, c_4, c_8 c_{10}	$u^{12} - u^{11} + u^9 + 8u^8 + u^7 - 7u^6 - 3u^5 - 6u^4 + 10u^3 - 18u^2 + 12u + 1$
c_6, c_7, c_{11} c_{12}	$(u^3 + u^2 - 2u - 1)^4$
c_9	$u^{12} + u^{11} + \cdots + 84u - 29$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{12} + 15y^{11} + \cdots - 1900y + 1$
c_2, c_5	$(y^2 - 3y + 1)^6$
c_3, c_4, c_8 c_{10}	$y^{12} - y^{11} + \cdots - 180y + 1$
c_6, c_7, c_{11} c_{12}	$(y^3 - 5y^2 + 6y - 1)^4$
c_9	$y^{12} + 11y^{11} + \cdots - 7288y + 841$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.24698$ $a = 0.288735 + 1.074830I$ $b = 1.00883 - 1.07483I$	10.2926	6.00000
$u = -1.24698$ $a = 0.288735 - 1.074830I$ $b = 1.00883 + 1.07483I$	10.2926	6.00000
$u = -1.24698$ $a = -0.570245$ $b = 0.0746199$	2.39690	6.00000
$u = -1.24698$ $a = 0.349671$ $b = -0.845296$	2.39690	6.00000
$u = 0.445042$ $a = 0.0516489$ $b = 1.33706$	−3.24287	6.00000
$u = 0.445042$ $a = 2.45072$ $b = -1.06201$	−3.24287	6.00000
$u = 0.445042$ $a = -3.27564 + 0.82853I$ $b = -0.360046 - 0.828531I$	4.65281	6.00000
$u = 0.445042$ $a = -3.27564 - 0.82853I$ $b = -0.360046 + 0.828531I$	4.65281	6.00000
$u = 1.80194$ $a = -0.213846 + 1.148430I$ $b = 0.556829 - 1.148430I$	13.6765	6.00000
$u = 1.80194$ $a = -0.213846 - 1.148430I$ $b = 0.556829 + 1.148430I$	13.6765	6.00000

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.80194$ $a = 0.55986 + 1.31903I$ $b = -1.45780 - 1.31903I$	-17.9063	6.00000
$u = 1.80194$ $a = 0.55986 - 1.31903I$ $b = -1.45780 + 1.31903I$	-17.9063	6.00000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^8+3u^7+6u^6+4u^5-7u^4-12u^3-u^2+6u+1)$ $\cdot(u^{12}-u^{11}+\cdots-42u-1)(u^{13}-u^{12}+\cdots+15u+1)$
c_2	$(u^2-u-1)^6(u^8+3u^7-u^6-11u^5-6u^4+11u^3+8u^2-3u-1)$ $\cdot(u^{13}+6u^{12}+\cdots+12u+8)$
c_3, c_8	$(u^8+u^7-2u^6-2u^5-u^4+u^2+1)$ $\cdot(u^{12}-u^{11}+u^9+8u^8+u^7-7u^6-3u^5-6u^4+10u^3-18u^2+12u+1)$ $\cdot(u^{13}-u^{12}+\cdots+u-1)$
c_4, c_{10}	$(u^8-u^7-2u^6+2u^5-u^4+u^2+1)$ $\cdot(u^{12}-u^{11}+u^9+8u^8+u^7-7u^6-3u^5-6u^4+10u^3-18u^2+12u+1)$ $\cdot(u^{13}-u^{12}+\cdots+u-1)$
c_5	$(u^2-u-1)^6(u^8-3u^7-u^6+11u^5-6u^4-11u^3+8u^2+3u-1)$ $\cdot(u^{13}+6u^{12}+\cdots+12u+8)$
c_6, c_7	$(u^3+u^2-2u-1)^4(u^8-6u^6-u^5+11u^4+4u^3-6u^2-3u+1)$ $\cdot(u^{13}-5u^{12}+\cdots+10u-4)$
c_9	$(u^8+u^6-u^4-2u^3-2u^2+u+1)(u^{12}+u^{11}+\cdots+84u-29)$ $\cdot(u^{13}+15u^{11}+\cdots-15u^2-1)$
c_{11}, c_{12}	$(u^3+u^2-2u-1)^4(u^8-6u^6+u^5+11u^4-4u^3-6u^2+3u+1)$ $\cdot(u^{13}-5u^{12}+\cdots+10u-4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^8+3y^7-2y^6-30y^5+99y^4-166y^3+131y^2-38y+1)$ $\cdot(y^{12}+15y^{11}+\cdots-1900y+1)(y^{13}+39y^{12}+\cdots+155y-1)$
c_2, c_5	$(y^2-3y+1)^6$ $\cdot(y^8-11y^7+55y^6-159y^5+278y^4-281y^3+142y^2-25y+1)$ $\cdot(y^{13}-14y^{12}+\cdots+80y-64)$
c_3, c_4, c_8 c_{10}	$(y^8-5y^7+6y^6+2y^5-y^4-6y^3-y^2+2y+1)$ $\cdot(y^{12}-y^{11}+\cdots-180y+1)(y^{13}+7y^{12}+\cdots-y-1)$
c_6, c_7, c_{11} c_{12}	$(y^3-5y^2+6y-1)^4$ $\cdot(y^8-12y^7+58y^6-145y^5+203y^4-166y^3+82y^2-21y+1)$ $\cdot(y^{13}-17y^{12}+\cdots-68y-16)$
c_9	$(y^8+2y^7-y^6-6y^5-y^4+2y^3+6y^2-5y+1)$ $\cdot(y^{12}+11y^{11}+\cdots-7288y+841)(y^{13}+30y^{12}+\cdots-30y-1)$