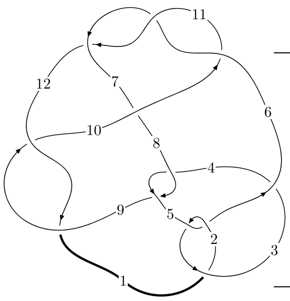
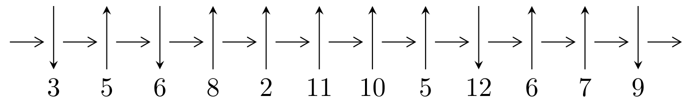
$12n_{0054}$ ($K12n_{0054}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -2u^{23} + 2u^{22} + \cdots + 2b - 2,\ u^{20} - u^{19} + \cdots + 2a - 1,\ u^{24} - 3u^{23} + \cdots - u - 1 \rangle$$
$$I_2^u = \langle u^4a + au + b - a + u,\ u^4a + u^3a + u^4 - 2u^2a + 2u^3 + a^2 - au - u^2 + a - 3u,\ u^5 + u^4 - 2u^3 - u^2 + u - 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 34 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.

$$\boldsymbol{I_1^u = \langle -2u^{23}+2u^{22}+\cdots+2b-2,\ u^{20}-u^{19}+\cdots+2a-1,\ u^{24}-3u^{23}+\cdots-u-1\rangle}$$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ -u^3+u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3+2u \\ -u^3+u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{2}u^{20}+\frac{1}{2}u^{19}+\cdots-\frac{7}{2}u+\frac{1}{2} \\ u^{23}-u^{22}+\cdots+\frac{1}{2}u+1 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -u^{22}+2u^{21}+\cdots-\frac{5}{2}u-\frac{3}{2} \\ -u^{23}+\frac{3}{2}u^{22}+\cdots-\frac{3}{2}u-1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^{23}+13u^{21}+\cdots-\frac{7}{2}u-\frac{5}{2} \\ -\frac{1}{2}u^{20}+5u^{18}+\cdots+3u^2-\frac{1}{2}u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} u^{10}-5u^8+8u^6-3u^4-u^2-1 \\ -u^{12}+6u^{10}-12u^8+8u^6-u^4+2u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{23}+13u^{21}+\cdots-\frac{7}{2}u-\frac{5}{2} \\ -4u^{23}+\frac{11}{2}u^{22}+\cdots-\frac{9}{2}u-3 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^6-3u^4+2u^2+1 \\ -u^8+4u^6-4u^4 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{5}{2}u^{23}+\frac{7}{2}u^{22}+25u^{21}-29u^{20}-\frac{215}{2}u^{19}+83u^{18}+261u^{17}-59u^{16}-\frac{775}{2}u^{15}-\frac{305}{2}u^{14}+325u^{13}+\frac{601}{2}u^{12}-66u^{11}-\frac{251}{2}u^{10}-\frac{195}{2}u^9-33u^8+2u^7-2u^6+27u^5-8u^4+50u^3+7u^2-2u+\frac{5}{2}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{24} + 2u^{23} + \cdots - 22u^2 + 1$
c_2, c_5	$u^{24} + 6u^{23} + \cdots + 4u + 1$
c_3	$u^{24} - 6u^{23} + \cdots + 22568u + 2857$
c_4, c_8	$u^{24} - u^{23} + \cdots + 2048u - 1024$
c_6, c_{10}, c_{11}	$u^{24} - 3u^{23} + \cdots - u - 1$
c_7	$u^{24} + 9u^{23} + \cdots + 193u + 37$
c_9, c_{12}	$u^{24} - u^{23} + \cdots + 3u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{24} + 46y^{23} + \cdots - 44y + 1$
c_2, c_5	$y^{24} + 2y^{23} + \cdots - 22y^2 + 1$
c_3	$y^{24} + 90y^{23} + \cdots + 73696224y + 8162449$
c_4, c_8	$y^{24} - 55y^{23} + \cdots + 3145728y + 1048576$
c_6, c_{10}, c_{11}	$y^{24} - 25y^{23} + \cdots - 7y + 1$
c_7	$y^{24} - 21y^{23} + \cdots - 29479y + 1369$
c_9, c_{12}	$y^{24} + 43y^{23} + \cdots - 7y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.576252 + 0.762796I$ $a = 0.17468 - 1.56325I$ $b = 1.184550 - 0.408250I$	$15.5271 + 1.3395I$	$7.10412 + 0.50033I$
$u = -0.576252 - 0.762796I$ $a = 0.17468 + 1.56325I$ $b = 1.184550 + 0.408250I$	$15.5271 - 1.3395I$	$7.10412 - 0.50033I$
$u = -0.514997 + 0.789630I$ $a = -1.57008 - 0.30044I$ $b = -1.76900 - 0.98677I$	$15.3349 - 6.5027I$	$6.70839 + 4.44626I$
$u = -0.514997 - 0.789630I$ $a = -1.57008 + 0.30044I$ $b = -1.76900 + 0.98677I$	$15.3349 + 6.5027I$	$6.70839 - 4.44626I$
$u = 1.225150 + 0.076811I$ $a = 0.083295 + 0.422369I$ $b = 1.39234 - 0.93644I$	$2.02860 + 0.55793I$	$3.98398 + 0.47568I$
$u = 1.225150 - 0.076811I$ $a = 0.083295 - 0.422369I$ $b = 1.39234 + 0.93644I$	$2.02860 - 0.55793I$	$3.98398 - 0.47568I$
$u = 0.386232 + 0.611238I$ $a = 0.587872 - 0.504692I$ $b = 0.568781 - 0.120868I$	$0.95423 + 1.88035I$	$5.59254 - 3.14019I$
$u = 0.386232 - 0.611238I$ $a = 0.587872 + 0.504692I$ $b = 0.568781 + 0.120868I$	$0.95423 - 1.88035I$	$5.59254 + 3.14019I$
$u = -1.368080 + 0.114668I$ $a = 0.221757 - 0.722378I$ $b = 0.31647 + 2.25463I$	$3.28861 - 3.53789I$	$6.68532 + 4.97474I$
$u = -1.368080 - 0.114668I$ $a = 0.221757 + 0.722378I$ $b = 0.31647 - 2.25463I$	$3.28861 + 3.53789I$	$6.68532 - 4.97474I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.45120 + 0.24568I$ $a = -0.508403 + 0.116308I$ $b = -1.21041 - 0.93814I$	$6.85595 - 5.06667I$	$9.81977 + 2.58134I$
$u = -1.45120 - 0.24568I$ $a = -0.508403 - 0.116308I$ $b = -1.21041 + 0.93814I$	$6.85595 + 5.06667I$	$9.81977 - 2.58134I$
$u = 1.47737 + 0.05442I$ $a = -0.580000 - 0.650952I$ $b = -1.53636 + 0.50809I$	$6.55976 + 3.21841I$	$9.78805 - 2.36901I$
$u = 1.47737 - 0.05442I$ $a = -0.580000 + 0.650952I$ $b = -1.53636 - 0.50809I$	$6.55976 - 3.21841I$	$9.78805 + 2.36901I$
$u = 0.519837$ $a = -1.00613$ $b = 0.367248$	1.05585	10.2690
$u = -1.50378$ $a = 0.695944$ $b = 0.281103$	7.71062	11.8740
$u = 0.073930 + 0.488820I$ $a = -1.54481 + 0.21964I$ $b = -1.121570 + 0.795516I$	$-1.23888 + 1.54124I$	$-1.90845 - 5.21623I$
$u = 0.073930 - 0.488820I$ $a = -1.54481 - 0.21964I$ $b = -1.121570 - 0.795516I$	$-1.23888 - 1.54124I$	$-1.90845 + 5.21623I$
$u = 1.53161 + 0.28371I$ $a = 0.782365 + 0.603573I$ $b = 1.95290 - 1.78945I$	$-17.4846 + 10.4436I$	$9.58510 - 4.63962I$
$u = 1.53161 - 0.28371I$ $a = 0.782365 - 0.603573I$ $b = 1.95290 + 1.78945I$	$-17.4846 - 10.4436I$	$9.58510 + 4.63962I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.55820 + 0.25583I$ $a = 0.626457 - 0.749741I$ $b = -0.376301 - 0.227538I$	$-16.9383 + 2.4136I$	$10.12159 - 0.67000I$
$u = 1.55820 - 0.25583I$ $a = 0.626457 + 0.749741I$ $b = -0.376301 + 0.227538I$	$-16.9383 - 2.4136I$	$10.12159 + 0.67000I$
$u = -0.349993 + 0.170334I$ $a = 2.38196 - 1.38000I$ $b = 0.774418 + 0.002185I$	$0.46862 - 2.38365I$	$3.44790 + 2.07617I$
$u = -0.349993 - 0.170334I$ $a = 2.38196 + 1.38000I$ $b = 0.774418 - 0.002185I$	$0.46862 + 2.38365I$	$3.44790 - 2.07617I$

II.

$$\boldsymbol{I_2^u = \langle u^4a + au + b - a + u,\ u^4a + u^4 + \cdots + a^2 + a,\ u^5 + u^4 - 2u^3 - u^2 + u - 1\rangle}$$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} a \\ -u^4a - au + a - u \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} u^4 + u^3 - 2u^2 + a - u + 1 \\ -u^4a + u^4 + u^2a - au - 2u^2 + a \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^4 + u^3 - 2u^2 + a - u + 1 \\ -u^4a + u^4 - au - 2u^2 + a - u \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} u^4 + u^3 - 2u^2 + a - u + 1 \\ -u^4a + u^4 + u^2a - au - 2u^2 + a \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= u^4a - u^3a - 2u^2a + 5u^3 + 5au - 9u + 10$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.21774$ $a = -0.410598 + 0.711177I$ $b = -0.22546 - 1.71868I$	$2.40108 - 2.02988I$	$6.62546 + 2.50057I$
$u = 1.21774$ $a = -0.410598 - 0.711177I$ $b = -0.22546 + 1.71868I$	$2.40108 + 2.02988I$	$6.62546 - 2.50057I$
$u = 0.309916 + 0.549911I$ $a = -1.58413 + 0.01647I$ $b = -1.51295 + 0.11095I$	$0.329100 - 0.499304I$	$5.04069 - 0.50981I$
$u = 0.309916 + 0.549911I$ $a = 0.80632 + 1.36366I$ $b = 0.863922 + 0.161516I$	$0.32910 + 3.56046I$	$2.53179 - 8.01848I$
$u = 0.309916 - 0.549911I$ $a = -1.58413 - 0.01647I$ $b = -1.51295 - 0.11095I$	$0.329100 + 0.499304I$	$5.04069 + 0.50981I$
$u = 0.309916 - 0.549911I$ $a = 0.80632 - 1.36366I$ $b = 0.863922 - 0.161516I$	$0.32910 - 3.56046I$	$2.53179 + 8.01848I$
$u = -1.41878 + 0.21917I$ $a = 0.252108 + 0.649344I$ $b = -0.291925 - 0.343564I$	$5.87256 - 2.37095I$	$9.19707 + 1.05452I$
$u = -1.41878 + 0.21917I$ $a = 0.436295 - 0.543004I$ $b = 2.16641 + 1.32455I$	$5.87256 - 6.43072I$	$6.60498 + 6.63374I$
$u = -1.41878 - 0.21917I$ $a = 0.252108 - 0.649344I$ $b = -0.291925 + 0.343564I$	$5.87256 + 2.37095I$	$9.19707 - 1.05452I$
$u = -1.41878 - 0.21917I$ $a = 0.436295 + 0.543004I$ $b = 2.16641 - 1.32455I$	$5.87256 + 6.43072I$	$6.60498 - 6.63374I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^5)(u^{24}+2u^{23}+\cdots-22u^2+1)$
c_2	$((u^2+u+1)^5)(u^{24}+6u^{23}+\cdots+4u+1)$
c_3	$((u^2-u+1)^5)(u^{24}-6u^{23}+\cdots+22568u+2857)$
c_4, c_8	$u^{10}(u^{24}-u^{23}+\cdots+2048u-1024)$
c_5	$((u^2-u+1)^5)(u^{24}+6u^{23}+\cdots+4u+1)$
c_6	$((u^5-u^4-2u^3+u^2+u+1)^2)(u^{24}-3u^{23}+\cdots-u-1)$
c_7	$((u^5+3u^4+4u^3+u^2-u-1)^2)(u^{24}+9u^{23}+\cdots+193u+37)$
c_9	$((u^5+u^4+2u^3+u^2+u+1)^2)(u^{24}-u^{23}+\cdots+3u-1)$
c_{10}, c_{11}	$((u^5+u^4-2u^3-u^2+u-1)^2)(u^{24}-3u^{23}+\cdots-u-1)$
c_{12}	$((u^5-u^4+2u^3-u^2+u-1)^2)(u^{24}-u^{23}+\cdots+3u-1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^2+y+1)^5)(y^{24}+46y^{23}+\cdots-44y+1)$
c_2, c_5	$((y^2+y+1)^5)(y^{24}+2y^{23}+\cdots-22y^2+1)$
c_3	$((y^2+y+1)^5)(y^{24}+90y^{23}+\cdots+7.36962\times 10^7 y+8162449)$
c_4, c_8	$y^{10}(y^{24}-55y^{23}+\cdots+3145728y+1048576)$
c_6, c_{10}, c_{11}	$((y^5-5y^4+8y^3-3y^2-y-1)^2)(y^{24}-25y^{23}+\cdots-7y+1)$
c_7	$((y^5-y^4+8y^3-3y^2+3y-1)^2)(y^{24}-21y^{23}+\cdots-29479y+1369)$
c_9, c_{12}	$((y^5+3y^4+4y^3+y^2-y-1)^2)(y^{24}+43y^{23}+\cdots-7y+1)$