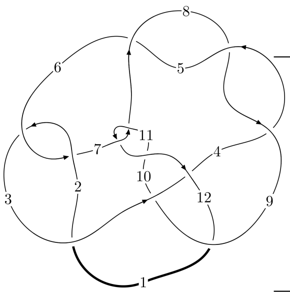
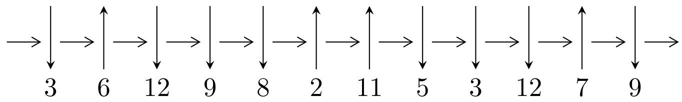
$12n_{0524}$ ($K12n_{0524}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle 1096u^{18} + 7571u^{17} + \cdots + 2606b + 15844,\ 3961u^{18} + 29496u^{17} + \cdots + 5212a + 60062,\\
&\quad u^{19} + 8u^{18} + \cdots + 40u + 8\rangle\\
I_2^u &= \langle u^{22} - 7u^{21} + \cdots + 4b - 16,\ -80u^{22}a + 97u^{22} + \cdots - 45a + 3,\ u^{23} - 3u^{22} + \cdots - 11u + 5\rangle\\
I_3^u &= \langle u^9 - u^8 + 5u^7 - 5u^6 + 9u^5 - 7u^4 + 7u^3 - 2u^2 + b + u,\ u^8 - u^7 + 5u^6 - 5u^5 + 9u^4 - 7u^3 + 7u^2 + a - 2u +\\
&\quad u^{10} - u^9 + 6u^8 - 5u^7 + 13u^6 - 7u^5 + 12u^4 - u^3 + 4u^2 + 2u + 1\rangle\\
I_4^u &= \langle au + b + 1,\ u^4a + u^4 + 3u^2a + a^2 + 4u^2 + 2a + 4,\ u^5 + 3u^3 + 2u - 1\rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 85 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. $\boldsymbol{I^u_1 = \langle 1096u^{18} + 7571u^{17} + \cdots + 2606b + 15844,\ 3961u^{18} + 29496u^{17} + \cdots + 5212a + 60062,\ u^{19} + 8u^{18} + \cdots + 40u + 8\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.759977u^{18} - 5.65925u^{17} + \cdots - 37.0253u - 11.5238 \\ -0.420568u^{18} - 2.90522u^{17} + \cdots - 18.8753u - 6.07982 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.759977u^{18} - 5.65925u^{17} + \cdots - 37.0253u - 11.5238 \\ -0.879893u^{18} - 5.90982u^{17} + \cdots - 29.6182u - 9.44436 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -1.19052u^{18} - 8.97371u^{17} + \cdots - 54.1759u - 15.1274 \\ -0.550460u^{18} - 4.31504u^{17} + \cdots - 31.4935u - 9.52417 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1.44561u^{18} + 10.7231u^{17} + \cdots + 56.3331u + 15.2068 \\ 0.930353u^{18} + 7.22487u^{17} + \cdots + 56.1117u + 15.9685 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.640061u^{18} + 4.65867u^{17} + \cdots + 21.6825u + 6.60322 \\ 0.550460u^{18} + 4.31504u^{17} + \cdots + 32.4935u + 9.52417 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.399079u^{18} - 3.11992u^{17} + \cdots - 23.7630u - 7.95165 \\ -0.129893u^{18} - 0.909823u^{17} + \cdots - 2.11819u - 1.44436 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.879029u^{18} + 6.38162u^{17} + \cdots + 29.0679u + 7.33653 \\ -0.118764u^{18} - 0.712970u^{17} + \cdots + 2.14083u + 1.38987 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{3773}{1303}u^{18} + \frac{27698}{1303}u^{17} + \cdots + \frac{165236}{1303}u + \frac{31950}{1303}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{19} + 11u^{18} + \cdots - 9u - 1$
c_2, c_6, c_7 c_{11}	$u^{19} - u^{18} + \cdots - u + 1$
c_3, c_{12}	$u^{19} - u^{18} + \cdots + 2u + 1$
c_4, c_5, c_8	$u^{19} - 8u^{18} + \cdots + 40u - 8$
c_9	$u^{19} + 17u^{18} + \cdots + 672u + 64$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{19} + 3y^{18} + \cdots - 5y - 1$
c_2, c_6, c_7 c_{11}	$y^{19} + 11y^{18} + \cdots - 9y - 1$
c_3, c_{12}	$y^{19} - 25y^{18} + \cdots - 8y - 1$
c_4, c_5, c_8	$y^{19} + 16y^{18} + \cdots + 32y - 64$
c_9	$y^{19} - 9y^{18} + \cdots - 7168y - 4096$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.616811 + 0.855089I$ $a = -1.021840 - 0.627553I$ $b = -1.166890 + 0.486679I$	$-3.17455 + 2.33222I$	$-9.09826 - 1.94044I$
$u = -0.616811 - 0.855089I$ $a = -1.021840 + 0.627553I$ $b = -1.166890 - 0.486679I$	$-3.17455 - 2.33222I$	$-9.09826 + 1.94044I$
$u = -1.120010 + 0.195383I$ $a = 1.52958 + 0.02914I$ $b = 1.71883 - 0.26621I$	$-9.12103 + 9.62063I$	$-8.08284 - 6.41226I$
$u = -1.120010 - 0.195383I$ $a = 1.52958 - 0.02914I$ $b = 1.71883 + 0.26621I$	$-9.12103 - 9.62063I$	$-8.08284 + 6.41226I$
$u = -0.678394 + 0.473924I$ $a = -0.638948 - 0.805280I$ $b = -0.815100 - 0.243485I$	$-3.94120 + 2.37372I$	$-9.61488 - 3.89895I$
$u = -0.678394 - 0.473924I$ $a = -0.638948 + 0.805280I$ $b = -0.815100 + 0.243485I$	$-3.94120 - 2.37372I$	$-9.61488 + 3.89895I$
$u = -0.643620$ $a = -2.20220$ $b = -1.41738$	-2.91062	-2.04050
$u = -0.283257 + 1.330640I$ $a = -0.629985 - 0.965924I$ $b = -1.46374 + 0.56468I$	$1.36748 + 3.35758I$	$-0.130533 - 0.838590I$
$u = -0.283257 - 1.330640I$ $a = -0.629985 + 0.965924I$ $b = -1.46374 - 0.56468I$	$1.36748 - 3.35758I$	$-0.130533 + 0.838590I$
$u = -0.72609 + 1.25708I$ $a = 0.602034 + 0.850739I$ $b = 1.50658 - 0.13910I$	$-5.96103 - 3.19218I$	$-6.11033 + 3.75659I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.72609 - 1.25708I$ $a = 0.602034 - 0.850739I$ $b = 1.50658 + 0.13910I$	$-5.96103 + 3.19218I$	$-6.11033 - 3.75659I$
$u = 0.344998 + 0.346579I$ $a = 0.494258 + 0.345842I$ $b = -0.050657 - 0.290614I$	$-0.136375 - 0.955727I$	$-2.79406 + 6.93579I$
$u = 0.344998 - 0.346579I$ $a = 0.494258 - 0.345842I$ $b = -0.050657 + 0.290614I$	$-0.136375 + 0.955727I$	$-2.79406 - 6.93579I$
$u = -0.20896 + 1.50540I$ $a = 0.164518 - 0.451521I$ $b = -0.645343 - 0.342017I$	$2.53796 + 5.54235I$	$-7.14543 - 3.27743I$
$u = -0.20896 - 1.50540I$ $a = 0.164518 + 0.451521I$ $b = -0.645343 + 0.342017I$	$2.53796 - 5.54235I$	$-7.14543 + 3.27743I$
$u = -0.49084 + 1.46047I$ $a = 0.735940 + 0.906077I$ $b = 1.68453 - 0.63008I$	$-3.8953 + 15.3465I$	$-4.88591 - 8.00097I$
$u = -0.49084 - 1.46047I$ $a = 0.735940 - 0.906077I$ $b = 1.68453 + 0.63008I$	$-3.8953 - 15.3465I$	$-4.88591 + 8.00097I$
$u = 0.10117 + 1.56824I$ $a = 0.115543 + 0.288337I$ $b = 0.440490 - 0.210371I$	$6.50755 - 2.80738I$	$-1.61751 + 0.28698I$
$u = 0.10117 - 1.56824I$ $a = 0.115543 - 0.288337I$ $b = 0.440490 + 0.210371I$	$6.50755 + 2.80738I$	$-1.61751 - 0.28698I$

II. $I_2^u = \langle u^{22} - 7u^{21} + \cdots + 4b - 16,\ -80u^{22}a + 97u^{22} + \cdots - 45a + 3,\ u^{23} - 3u^{22} + \cdots - 11u + 5\rangle$

(i) Arc colorings

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

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

$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} a \\ -\frac{1}{4}u^{22} + \frac{7}{4}u^{21} + \cdots - \frac{37}{4}u + 4 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} a \\ -\frac{1}{4}u^{22} + \frac{7}{4}u^{21} + \cdots - \frac{37}{4}u + 4 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.350000u^{22} - 2.05000u^{21} + \cdots + 10.7000u - 3.85000 \\ -u^{22}a - \frac{7}{4}u^{22} + \cdots - \frac{5}{4}a + \frac{29}{4} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0500000u^{22} - 1.15000u^{21} + \cdots + 8.35000u - 4.55000 \\ \frac{3}{2}u^{22}a - \frac{3}{2}u^{22} + \cdots - \frac{15}{4}a - \frac{13}{4} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{1}{4}u^{22}a + \frac{27}{20}u^{22} + \cdots + 4a - \frac{31}{10} \\ -u^{22} + \frac{9}{4}u^{21} + \cdots + \frac{33}{4}u^2 - \frac{7}{4} \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u^{21}a + \frac{11}{10}u^{22} + \cdots + \frac{5}{2}a - \frac{97}{20} \\ -\frac{1}{2}u^{22}a - u^{22} + \cdots - 7u + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{3}{4}u^{22}a + \frac{13}{20}u^{22} + \cdots - 2a - \frac{29}{10} \\ \frac{3}{4}u^{22}a + \frac{1}{2}u^{22} + \cdots + \frac{5}{4}a - 4 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= 2u^{21} - 5u^{20} + 25u^{19} - 48u^{18} + 126u^{17} - 191u^{16} + 333u^{15} - 398u^{14} + 484u^{13} - 437u^{12} + 341u^{11} - 191u^{10} + 29u^9 + 56u^8 - 78u^7 + 72u^6 + 8u^5 + 13u^4 + 23u^3 + 6u^2 - 8u - 2$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{46} + 26u^{45} + \cdots + 2067u + 121$
c_2, c_6, c_7 c_{11}	$u^{46} - 2u^{45} + \cdots - 45u + 11$
c_3, c_{12}	$u^{46} - 2u^{45} + \cdots + 117u + 7$
c_4, c_5, c_8	$(u^{23} + 3u^{22} + \cdots - 11u - 5)^2$
c_9	$(u^{23} - 8u^{22} + \cdots - 26u + 5)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{46} - 6y^{45} + \cdots - 691857y + 14641$
c_2, c_6, c_7 c_{11}	$y^{46} + 26y^{45} + \cdots + 2067y + 121$
c_3, c_{12}	$y^{46} - 42y^{45} + \cdots + 4707y + 49$
c_4, c_5, c_8	$(y^{23} + 21y^{22} + \cdots + 51y - 25)^2$
c_9	$(y^{23} - 32y^{22} + \cdots + 36y - 25)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.949457 + 0.274301I$ $a = -1.53072 + 0.32112I$ $b = -1.70279 - 0.29302I$	$-6.21980 - 4.08700I$	$-6.45479 + 3.28019I$
$u = 0.949457 + 0.274301I$ $a = 1.73757 - 0.19337I$ $b = 1.54144 + 0.11499I$	$-6.21980 - 4.08700I$	$-6.45479 + 3.28019I$
$u = 0.949457 - 0.274301I$ $a = -1.53072 - 0.32112I$ $b = -1.70279 + 0.29302I$	$-6.21980 + 4.08700I$	$-6.45479 - 3.28019I$
$u = 0.949457 - 0.274301I$ $a = 1.73757 + 0.19337I$ $b = 1.54144 - 0.11499I$	$-6.21980 + 4.08700I$	$-6.45479 - 3.28019I$
$u = 0.129915 + 1.043420I$ $a = -0.493058 + 0.848090I$ $b = -1.94953 - 0.23067I$	$-5.55917 - 0.57299I$	$-3.52244 - 2.34138I$
$u = 0.129915 + 1.043420I$ $a = 0.44678 - 1.81277I$ $b = 0.948973 + 0.404288I$	$-5.55917 - 0.57299I$	$-3.52244 - 2.34138I$
$u = 0.129915 - 1.043420I$ $a = -0.493058 - 0.848090I$ $b = -1.94953 + 0.23067I$	$-5.55917 + 0.57299I$	$-3.52244 + 2.34138I$
$u = 0.129915 - 1.043420I$ $a = 0.44678 + 1.81277I$ $b = 0.948973 - 0.404288I$	$-5.55917 + 0.57299I$	$-3.52244 + 2.34138I$
$u = 0.157565 + 1.169780I$ $a = 0.170495 - 0.884679I$ $b = -0.525087 + 1.299010I$	$2.81400 - 1.37485I$	$-2.47637 + 0.94605I$
$u = 0.157565 + 1.169780I$ $a = -1.031300 - 0.587788I$ $b = -1.061750 - 0.060047I$	$2.81400 - 1.37485I$	$-2.47637 + 0.94605I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.157565 - 1.169780I$ $a = 0.170495 + 0.884679I$ $b = -0.525087 - 1.299010I$	$2.81400 + 1.37485I$	$-2.47637 - 0.94605I$
$u = 0.157565 - 1.169780I$ $a = -1.031300 + 0.587788I$ $b = -1.061750 + 0.060047I$	$2.81400 + 1.37485I$	$-2.47637 - 0.94605I$
$u = -0.297704 + 1.164290I$ $a = -0.315648 - 0.681415I$ $b = 0.02755 + 1.63095I$	$1.67762 + 7.26897I$	$-4.60706 - 6.86727I$
$u = -0.297704 + 1.164290I$ $a = -1.309170 + 0.358408I$ $b = -0.887336 + 0.164646I$	$1.67762 + 7.26897I$	$-4.60706 - 6.86727I$
$u = -0.297704 - 1.164290I$ $a = -0.315648 + 0.681415I$ $b = 0.02755 - 1.63095I$	$1.67762 - 7.26897I$	$-4.60706 + 6.86727I$
$u = -0.297704 - 1.164290I$ $a = -1.309170 - 0.358408I$ $b = -0.887336 - 0.164646I$	$1.67762 - 7.26897I$	$-4.60706 + 6.86727I$
$u = 0.701104 + 1.024510I$ $a = -0.679056 + 0.799381I$ $b = -1.62187 - 0.29006I$	$-4.06293 - 1.56405I$	$-5.53705 + 2.00718I$
$u = 0.701104 + 1.024510I$ $a = 0.930638 - 0.946208I$ $b = 1.295060 + 0.135249I$	$-4.06293 - 1.56405I$	$-5.53705 + 2.00718I$
$u = 0.701104 - 1.024510I$ $a = -0.679056 - 0.799381I$ $b = -1.62187 + 0.29006I$	$-4.06293 + 1.56405I$	$-5.53705 - 2.00718I$
$u = 0.701104 - 1.024510I$ $a = 0.930638 + 0.946208I$ $b = 1.295060 - 0.135249I$	$-4.06293 + 1.56405I$	$-5.53705 - 2.00718I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.700899$ $a=\ 2.31801+0.38865I$ $b=\ 1.62469-0.27240I$	-11.2801	-11.1210
$u=-0.700899$ $a=\ 2.31801-0.38865I$ $b=\ 1.62469+0.27240I$	-11.2801	-11.1210
$u=\ 0.098502+1.344050I$ $a=\ 0.866199-0.095805I$ $b=\ 0.845917-0.031157I$	$5.30060-3.06078I$	$0.29039+3.85817I$
$u=\ 0.098502+1.344050I$ $a=-0.022822+0.627708I$ $b=-0.214088-1.154780I$	$5.30060-3.06078I$	$0.29039+3.85817I$
$u=\ 0.098502-1.344050I$ $a=\ 0.866199+0.095805I$ $b=\ 0.845917+0.031157I$	$5.30060+3.06078I$	$0.29039-3.85817I$
$u=\ 0.098502-1.344050I$ $a=-0.022822-0.627708I$ $b=-0.214088+1.154780I$	$5.30060+3.06078I$	$0.29039-3.85817I$
$u=-0.314282+1.335820I$ $a=\ 0.636808+0.819242I$ $b=\ 1.79937-0.02411I$	$-7.00942+3.66737I$	$-5.63248-4.77182I$
$u=-0.314282+1.335820I$ $a=\ 0.317399+1.272340I$ $b=\ 1.29450-0.59319I$	$-7.00942+3.66737I$	$-5.63248-4.77182I$
$u=-0.314282-1.335820I$ $a=\ 0.636808-0.819242I$ $b=\ 1.79937+0.02411I$	$-7.00942-3.66737I$	$-5.63248+4.77182I$
$u=-0.314282-1.335820I$ $a=\ 0.317399-1.272340I$ $b=\ 1.29450+0.59319I$	$-7.00942-3.66737I$	$-5.63248+4.77182I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.540846 + 0.315918I$ $a = 0.051854 - 0.150163I$ $b = -0.539179 - 1.227400I$	$-0.93518 - 3.99671I$	$-9.62845 + 1.40973I$
$u = -0.540846 + 0.315918I$ $a = 0.24507 - 2.12626I$ $b = -0.0193942 - 0.0975969I$	$-0.93518 - 3.99671I$	$-9.62845 + 1.40973I$
$u = -0.540846 - 0.315918I$ $a = 0.051854 + 0.150163I$ $b = -0.539179 + 1.227400I$	$-0.93518 + 3.99671I$	$-9.62845 - 1.40973I$
$u = -0.540846 - 0.315918I$ $a = 0.24507 + 2.12626I$ $b = -0.0193942 + 0.0975969I$	$-0.93518 + 3.99671I$	$-9.62845 - 1.40973I$
$u = 0.499495 + 0.232325I$ $a = 0.80490 + 1.31816I$ $b = -0.0999299 - 0.0558064I$	$0.125631 - 0.991368I$	$-5.18428 + 5.58556I$
$u = 0.499495 + 0.232325I$ $a = 0.207202 + 0.015352I$ $b = -0.095801 - 0.845413I$	$0.125631 - 0.991368I$	$-5.18428 + 5.58556I$
$u = 0.499495 - 0.232325I$ $a = 0.80490 - 1.31816I$ $b = -0.0999299 + 0.0558064I$	$0.125631 + 0.991368I$	$-5.18428 - 5.58556I$
$u = 0.499495 - 0.232325I$ $a = 0.207202 - 0.015352I$ $b = -0.095801 + 0.845413I$	$0.125631 + 0.991368I$	$-5.18428 - 5.58556I$
$u = 0.40672 + 1.44182I$ $a = -0.563943 + 0.961951I$ $b = -1.54904 - 0.71550I$	$-0.79781 - 8.96070I$	$-2.64189 + 5.31157I$
$u = 0.40672 + 1.44182I$ $a = 0.740402 - 0.865507I$ $b = 1.61633 + 0.42186I$	$-0.79781 - 8.96070I$	$-2.64189 + 5.31157I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.40672 - 1.44182I$ $a = -0.563943 - 0.961951I$ $b = -1.54904 + 0.71550I$	$-0.79781 + 8.96070I$	$-2.64189 - 5.31157I$
$u = 0.40672 - 1.44182I$ $a = 0.740402 + 0.865507I$ $b = 1.61633 - 0.42186I$	$-0.79781 + 8.96070I$	$-2.64189 - 5.31157I$
$u = 0.06052 + 1.52562I$ $a = 0.443758 - 0.312131I$ $b = 0.775017 - 0.227308I$	$5.50209 - 2.76341I$	$-4.54493 + 5.66390I$
$u = 0.06052 + 1.52562I$ $a = 0.128639 + 0.513106I$ $b = -0.503049 - 0.658113I$	$5.50209 - 2.76341I$	$-4.54493 + 5.66390I$
$u = 0.06052 - 1.52562I$ $a = 0.443758 + 0.312131I$ $b = 0.775017 + 0.227308I$	$5.50209 + 2.76341I$	$-4.54493 - 5.66390I$
$u = 0.06052 - 1.52562I$ $a = 0.128639 - 0.513106I$ $b = -0.503049 + 0.658113I$	$5.50209 + 2.76341I$	$-4.54493 - 5.66390I$

III. $\boldsymbol{I_3^u = \langle u^9 - u^8 + \cdots + b + u,\ u^8 - u^7 + \cdots + a + 1,\ u^{10} - u^9 + \cdots + 2u + 1\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^8 + u^7 - 5u^6 + 5u^5 - 9u^4 + 7u^3 - 7u^2 + 2u - 1 \\ -u^9 + u^8 - 5u^7 + 5u^6 - 9u^5 + 7u^4 - 7u^3 + 2u^2 - u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^8 + u^7 - 5u^6 + 5u^5 - 9u^4 + 7u^3 - 7u^2 + 2u - 1 \\ -u^9 + 2u^8 - 5u^7 + 9u^6 - 9u^5 + 12u^4 - 6u^3 + 5u^2 + u + 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^8 - u^7 + 5u^6 - 4u^5 + 8u^4 - 3u^3 + 4u^2 + 2u \\ u^9 - u^8 + 5u^7 - 4u^6 + 8u^5 - 3u^4 + 4u^3 + 2u^2 - u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 2u^8 - u^7 + 9u^6 - 4u^5 + 13u^4 - 2u^3 + 8u^2 + 4u + 2 \\ 2u^9 - 2u^8 + 10u^7 - 9u^6 + 17u^5 - 10u^4 + 11u^3 + u - 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^9 + 2u^8 - 6u^7 + 9u^6 - 12u^5 + 11u^4 - 7u^3 + 2u^2 + 2u - 1 \\ u^9 - u^8 + 5u^7 - 4u^6 + 8u^5 - 3u^4 + 4u^3 + 2u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^2 + 1 \\ u^4 + 2u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^8 - u^7 + 5u^6 - 3u^5 + 7u^4 + 2u^2 + 4u \\ u^9 + 5u^7 + 8u^5 + 2u^4 + 5u^3 + 5u^2 + u + 1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^9 + u^8 - 6u^7 + 6u^6 - 13u^5 + 10u^4 - 12u^3 + 4u^2 - 3u + 1 \\ u^8 + 4u^6 + 5u^4 + 2u^3 + 3u^2 + 4u + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 5u^9 - 4u^8 + 24u^7 - 20u^6 + 44u^5 - 28u^4 + 40u^3 - 8u^2 + 12u$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{10} - 7u^9 + \cdots - 8u + 1$
c_2, c_7	$u^{10} - u^9 + 4u^8 - 3u^7 + 7u^6 - 4u^5 + 7u^4 - 3u^3 + 4u^2 + 1$
c_3, c_{12}	$u^{10} + u^9 - 2u^8 - 4u^7 - 3u^6 + u^5 + 6u^4 + 7u^3 + 6u^2 + 3u + 1$
c_4, c_5	$u^{10} - u^9 + 6u^8 - 5u^7 + 13u^6 - 7u^5 + 12u^4 - u^3 + 4u^2 + 2u + 1$
c_6, c_{11}	$u^{10} + u^9 + 4u^8 + 3u^7 + 7u^6 + 4u^5 + 7u^4 + 3u^3 + 4u^2 + 1$
c_8	$u^{10} + u^9 + 6u^8 + 5u^7 + 13u^6 + 7u^5 + 12u^4 + u^3 + 4u^2 - 2u + 1$
c_9	$u^{10} - 4u^9 + 6u^8 - 10u^7 + 17u^6 - 13u^5 + 11u^4 - 7u^3 - 2u^2 + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{10} - y^9 - 19y^7 - 21y^6 + 34y^5 + 145y^4 + 217y^3 + 102y^2 - 4y + 1$
c_2, c_6, c_7 c_{11}	$y^{10} + 7y^9 + \cdots + 8y + 1$
c_3, c_{12}	$y^{10} - 5y^9 + 6y^8 + 6y^7 - 9y^6 - 9y^5 + 6y^4 + 11y^3 + 6y^2 + 3y + 1$
c_4, c_5, c_8	$y^{10} + 11y^9 + \cdots + 4y + 1$
c_9	$y^{10} - 4y^9 + \cdots - 5y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.250000 + 0.998657I$ $a = 0.59595 - 1.38352I$ $b = 1.53065 + 0.24927I$	$-8.30263 - 0.98508I$	$-8.00878 + 0.35212I$
$u = 0.250000 - 0.998657I$ $a = 0.59595 + 1.38352I$ $b = 1.53065 - 0.24927I$	$-8.30263 + 0.98508I$	$-8.00878 - 0.35212I$
$u = 0.692359 + 0.857180I$ $a = -0.929090 + 0.709584I$ $b = -1.251510 - 0.305111I$	$-2.35435 - 2.60043I$	$0.40869 + 4.75693I$
$u = 0.692359 - 0.857180I$ $a = -0.929090 - 0.709584I$ $b = -1.251510 + 0.305111I$	$-2.35435 + 2.60043I$	$0.40869 - 4.75693I$
$u = -0.159586 + 1.376540I$ $a = 0.576417 - 0.085459I$ $b = 0.025649 + 0.807097I$	$3.84271 + 6.23098I$	$-0.71193 - 5.55731I$
$u = -0.159586 - 1.376540I$ $a = 0.576417 + 0.085459I$ $b = 0.025649 - 0.807097I$	$3.84271 - 6.23098I$	$-0.71193 + 5.55731I$
$u = 0.00345 + 1.56150I$ $a = -0.310078 + 0.314723I$ $b = -0.492510 - 0.483102I$	$6.88666 - 3.66525I$	$2.21222 + 7.64965I$
$u = 0.00345 - 1.56150I$ $a = -0.310078 - 0.314723I$ $b = -0.492510 + 0.483102I$	$6.88666 + 3.66525I$	$2.21222 - 7.64965I$
$u = -0.286221 + 0.289922I$ $a = -0.93320 + 1.99841I$ $b = -0.312283 - 0.842541I$	$-0.07240 - 4.46416I$	$-0.40020 + 6.18186I$
$u = -0.286221 - 0.289922I$ $a = -0.93320 - 1.99841I$ $b = -0.312283 + 0.842541I$	$-0.07240 + 4.46416I$	$-0.40020 - 6.18186I$

IV. $\boldsymbol{I^u_4 = \langle au+b+1,\ u^4a+u^4+3u^2a+a^2+4u^2+2a+4,\ u^5+3u^3+2u-1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^4-3u^3+8u^2-6u-3$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{10} - y^9 + \cdots - y + 1$
c_2, c_6, c_7 c_{11}	$y^{10} + 7y^9 + \cdots + 7y + 1$
c_3, c_{12}	$y^{10} - 9y^9 + 28y^8 - 36y^7 + 34y^6 - 20y^5 + 12y^4 - 5y^3 + 2y^2 + 3y + 1$
c_4, c_5, c_8	$(y^5 + 6y^4 + 13y^3 + 12y^2 + 4y - 1)^2$
c_9	$(y^5 - 2y^4 - 3y^3 + 4y^2 + 8y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351694 + 0.989493I$ $a = -0.548693 - 0.777335I$ $b = -1.96214 + 0.26954I$	$-5.97351 + 1.36579I$	$-9.71244 - 4.93711I$
$u = -0.351694 + 0.989493I$ $a = \quad 0.86761 + 1.67460I$ $b = \quad 0.962140 - 0.269544I$	$-5.97351 + 1.36579I$	$-9.71244 - 4.93711I$
$u = -0.351694 - 0.989493I$ $a = -0.548693 + 0.777335I$ $b = -1.96214 - 0.26954I$	$-5.97351 - 1.36579I$	$-9.71244 + 4.93711I$
$u = -0.351694 - 0.989493I$ $a = \quad 0.86761 - 1.67460I$ $b = \quad 0.962140 + 0.269544I$	$-5.97351 - 1.36579I$	$-9.71244 + 4.93711I$
$u = \quad 0.15201 + 1.49915I$ $a = \quad 0.311870 + 0.594201I$ $b = -0.156612 - 0.557863I$	$5.78657 - 2.10101I$	$0.31723 - 3.66297I$
$u = \quad 0.15201 + 1.49915I$ $a = -0.378818 + 0.066057I$ $b = -0.843388 + 0.557863I$	$5.78657 - 2.10101I$	$0.31723 - 3.66297I$
$u = \quad 0.15201 - 1.49915I$ $a = \quad 0.311870 - 0.594201I$ $b = -0.156612 + 0.557863I$	$5.78657 + 2.10101I$	$0.31723 + 3.66297I$
$u = \quad 0.15201 - 1.49915I$ $a = -0.378818 - 0.066057I$ $b = -0.843388 - 0.557863I$	$5.78657 + 2.10101I$	$0.31723 + 3.66297I$
$u = \quad 0.399372$ $a = -1.25197 + 1.75955I$ $b = -0.500000 - 0.702714I$	0.373884	-4.20960
$u = \quad 0.399372$ $a = -1.25197 - 1.75955I$ $b = -0.500000 + 0.702714I$	0.373884	-4.20960

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$(u^{10}-7u^9+\cdots-7u+1)(u^{10}-7u^9+\cdots-8u+1)$ $\cdot(u^{19}+11u^{18}+\cdots-9u-1)(u^{46}+26u^{45}+\cdots+2067u+121)$
c_2, c_7	$(u^{10}-u^9+4u^8-3u^7+7u^6-4u^5+7u^4-3u^3+4u^2+1)$ $\cdot(u^{10}-u^9+4u^8-3u^7+7u^6-3u^5+7u^4-3u^3+4u^2-u+1)$ $\cdot(u^{19}-u^{18}+\cdots-u+1)(u^{46}-2u^{45}+\cdots-45u+11)$
c_3, c_{12}	$(u^{10}+u^9-2u^8-4u^7-3u^6+u^5+6u^4+7u^3+6u^2+3u+1)$ $\cdot(u^{10}+5u^9+8u^8+2u^7-8u^6-10u^5-2u^4+5u^3+6u^2+3u+1)$ $\cdot(u^{19}-u^{18}+\cdots+2u+1)(u^{46}-2u^{45}+\cdots+117u+7)$
c_4, c_5	$(u^5+3u^3+2u-1)^2$ $\cdot(u^{10}-u^9+6u^8-5u^7+13u^6-7u^5+12u^4-u^3+4u^2+2u+1)$ $\cdot(u^{19}-8u^{18}+\cdots+40u-8)(u^{23}+3u^{22}+\cdots-11u-5)^2$
c_6, c_{11}	$(u^{10}+u^9+4u^8+3u^7+7u^6+3u^5+7u^4+3u^3+4u^2+u+1)$ $\cdot(u^{10}+u^9+4u^8+3u^7+7u^6+4u^5+7u^4+3u^3+4u^2+1)$ $\cdot(u^{19}-u^{18}+\cdots-u+1)(u^{46}-2u^{45}+\cdots-45u+11)$
c_8	$(u^5+3u^3+2u+1)^2$ $\cdot(u^{10}+u^9+6u^8+5u^7+13u^6+7u^5+12u^4+u^3+4u^2-2u+1)$ $\cdot(u^{19}-8u^{18}+\cdots+40u-8)(u^{23}+3u^{22}+\cdots-11u-5)^2$
c_9	$(u^5+2u^4+u^3+2u^2+2u-1)^2$ $\cdot(u^{10}-4u^9+6u^8-10u^7+17u^6-13u^5+11u^4-7u^3-2u^2+u+1)$ $\cdot(u^{19}+17u^{18}+\cdots+672u+64)(u^{23}-8u^{22}+\cdots-26u+5)^2$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^{10} - y^9 - 19y^7 - 21y^6 + 34y^5 + 145y^4 + 217y^3 + 102y^2 - 4y + 1)$ $\cdot (y^{10} - y^9 + \cdots - y + 1)(y^{19} + 3y^{18} + \cdots - 5y - 1)$ $\cdot (y^{46} - 6y^{45} + \cdots - 691857y + 14641)$
c_2, c_6, c_7 c_{11}	$(y^{10} + 7y^9 + \cdots + 8y + 1)(y^{10} + 7y^9 + \cdots + 7y + 1)$ $\cdot (y^{19} + 11y^{18} + \cdots - 9y - 1)(y^{46} + 26y^{45} + \cdots + 2067y + 121)$
c_3, c_{12}	$(y^{10} - 9y^9 + 28y^8 - 36y^7 + 34y^6 - 20y^5 + 12y^4 - 5y^3 + 2y^2 + 3y + 1)$ $\cdot (y^{10} - 5y^9 + 6y^8 + 6y^7 - 9y^6 - 9y^5 + 6y^4 + 11y^3 + 6y^2 + 3y + 1)$ $\cdot (y^{19} - 25y^{18} + \cdots - 8y - 1)(y^{46} - 42y^{45} + \cdots + 4707y + 49)$
c_4, c_5, c_8	$((y^5 + 6y^4 + 13y^3 + 12y^2 + 4y - 1)^2)(y^{10} + 11y^9 + \cdots + 4y + 1)$ $\cdot (y^{19} + 16y^{18} + \cdots + 32y - 64)(y^{23} + 21y^{22} + \cdots + 51y - 25)^2$
c_9	$((y^5 - 2y^4 - 3y^3 + 4y^2 + 8y - 1)^2)(y^{10} - 4y^9 + \cdots - 5y + 1)$ $\cdot (y^{19} - 9y^{18} + \cdots - 7168y - 4096)(y^{23} - 32y^{22} + \cdots + 36y - 25)^2$