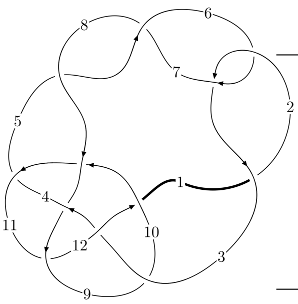
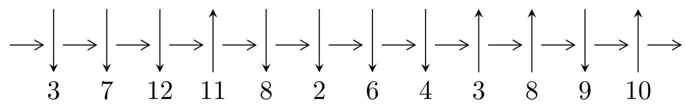
$12n_{0598}$ $(K12n_{0598})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -7u^{26} + 30u^{25} + \cdots + b + 25,\ -17u^{26} + 93u^{25} + \cdots + 4a + 113,\ u^{27} - 5u^{26} + \cdots - 21u + 4\rangle$$
$$I_2^u = \langle u^{17} + 2u^{16} + \cdots + b - u,\ -2u^{18} - 2u^{17} + \cdots - a + 1,\ u^{19} + 2u^{18} + \cdots - 2u - 1\rangle$$
$$\begin{aligned} I_3^u = \langle &-u^9 + u^8 + u^7 - 3u^6 - u^5 + 3u^4 - u^3 - u^2 + b - u, \\ &- 3u^9 + 3u^8 + 4u^7 - 9u^6 - 4u^5 + 11u^4 - 6u^2 + a - 2u + 2, \\ &u^{10} - 2u^9 + 4u^7 - 2u^6 - 4u^5 + 4u^4 + u^3 - u^2 - u + 1\rangle \end{aligned}$$
$$I_4^u = \langle u^2a + au - u^2 + b - u - 1,\ -u^2a + a^2 - 2au + 2u^2 - a + u + 1,\ u^3 + u^2 - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 81 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. $I_1^u = \langle -7u^{26} + 30u^{25} + \cdots + b + 25,\ -17u^{26} + 93u^{25} + \cdots + 4a + 113,\ u^{27} - 5u^{26} + \cdots - 21u + 4\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^5 + u \\ -u^7 + u^5 - 2u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 4.25000u^{26} - 23.2500u^{25} + \cdots + 127.250u - 28.2500 \\ 7u^{26} - 30u^{25} + \cdots + 120u - 25 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -2.75000u^{26} + 6.75000u^{25} + \cdots + 7.25000u - 3.25000 \\ 7u^{26} - 30u^{25} + \cdots + 120u - 25 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -\frac{1}{4}u^{26} - \frac{7}{4}u^{25} + \cdots + \frac{35}{4}u + \frac{1}{4} \\ 4u^{26} - 17u^{25} + \cdots + 56u - 11 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{23}{4}u^{26} - \frac{95}{4}u^{25} + \cdots + \frac{295}{4}u - \frac{55}{4} \\ 4u^{26} - 14u^{25} + \cdots + 23u - 3 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -3.75000u^{26} + 11.7500u^{25} + \cdots - 16.7500u + 3.75000 \\ 5u^{26} - 24u^{25} + \cdots + 109u - 25 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= 19u^{26} - 78u^{25} + 60u^{24} + 252u^{23} - 548u^{22} - 79u^{21} + 1369u^{20} - 955u^{19} - 1968u^{18} + 3221u^{17} + 1042u^{16} - 5938u^{15} + 2926u^{14} + 5761u^{13} - 7754u^{12} - 727u^{11} + 8181u^{10} - 4909u^9 - 3262u^8 + 5571u^7 - 1366u^6 - 2297u^5 + 2086u^4 - 317u^3 - 482u^2 + 330u - 70$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_7	$u^{27} + 11u^{26} + \cdots + 113u + 16$
c_2, c_6	$u^{27} - 5u^{26} + \cdots - 21u + 4$
c_3, c_8	$u^{27} - u^{26} + \cdots + u + 1$
c_4, c_9	$u^{27} + 11u^{25} + \cdots + u + 2$
c_{10}, c_{12}	$u^{27} - 4u^{26} + \cdots + 26u + 1$
c_{11}	$u^{27} - 17u^{26} + \cdots + 17u - 2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$y^{27} + 13y^{26} + \cdots - 1791y - 256$
c_2, c_6	$y^{27} - 11y^{26} + \cdots + 113y - 16$
c_3, c_8	$y^{27} + 17y^{26} + \cdots - 25y - 1$
c_4, c_9	$y^{27} + 22y^{26} + \cdots - 51y - 4$
c_{10}, c_{12}	$y^{27} + 22y^{26} + \cdots + 1168y - 1$
c_{11}	$y^{27} - 11y^{26} + \cdots + 141y - 4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.864243 + 0.479532I$ $a = -0.600429 + 0.483373I$ $b = 0.19687 - 1.45324I$	$1.57071 + 1.96220I$	$-0.12576 - 3.74500I$
$u = -0.864243 - 0.479532I$ $a = -0.600429 - 0.483373I$ $b = 0.19687 + 1.45324I$	$1.57071 - 1.96220I$	$-0.12576 + 3.74500I$
$u = 0.866868 + 0.574414I$ $a = 1.76716 - 0.03839I$ $b = 0.770838 - 0.761899I$	$1.97728 - 1.89599I$	$0.38293 + 1.93501I$
$u = 0.866868 - 0.574414I$ $a = 1.76716 + 0.03839I$ $b = 0.770838 + 0.761899I$	$1.97728 + 1.89599I$	$0.38293 - 1.93501I$
$u = 0.828720 + 0.632735I$ $a = -0.541336 - 1.188870I$ $b = -0.788115 - 0.419530I$	$2.08351 - 2.86910I$	$0.45455 + 4.55704I$
$u = 0.828720 - 0.632735I$ $a = -0.541336 + 1.188870I$ $b = -0.788115 + 0.419530I$	$2.08351 + 2.86910I$	$0.45455 - 4.55704I$
$u = 0.478338 + 0.945307I$ $a = -0.585812 - 1.214720I$ $b = -0.61991 - 1.41259I$	$-3.19592 + 10.10170I$	$-2.96328 - 5.29527I$
$u = 0.478338 - 0.945307I$ $a = -0.585812 + 1.214720I$ $b = -0.61991 + 1.41259I$	$-3.19592 - 10.10170I$	$-2.96328 + 5.29527I$
$u = -1.057110 + 0.305316I$ $a = 0.346302 - 0.328359I$ $b = -0.408568 + 1.012700I$	$-2.70927 + 0.54344I$	$-7.65821 - 3.08033I$
$u = -1.057110 - 0.305316I$ $a = 0.346302 + 0.328359I$ $b = -0.408568 - 1.012700I$	$-2.70927 - 0.54344I$	$-7.65821 + 3.08033I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.489865 + 0.986191I$ $a = -0.126436 + 0.961399I$ $b = -0.173783 + 1.172750I$	$-3.05897 - 4.78648I$	$-4.88388 + 4.28001I$
$u = 0.489865 - 0.986191I$ $a = -0.126436 - 0.961399I$ $b = -0.173783 - 1.172750I$	$-3.05897 + 4.78648I$	$-4.88388 - 4.28001I$
$u = 1.083610 + 0.532695I$ $a = -1.64599 - 0.83777I$ $b = -0.838842 + 0.861616I$	$-1.17518 - 6.47379I$	$0.54363 + 4.97870I$
$u = 1.083610 - 0.532695I$ $a = -1.64599 + 0.83777I$ $b = -0.838842 - 0.861616I$	$-1.17518 + 6.47379I$	$0.54363 - 4.97870I$
$u = -0.715640$ $a = 0.335339$ $b = -0.411723$	-1.06047	-9.47740
$u = -1.286490 + 0.001736I$ $a = -0.107348 - 0.508252I$ $b = 0.31892 + 1.49437I$	$-9.87702 + 7.48549I$	$-8.34292 - 4.59339I$
$u = -1.286490 - 0.001736I$ $a = -0.107348 + 0.508252I$ $b = 0.31892 - 1.49437I$	$-9.87702 - 7.48549I$	$-8.34292 + 4.59339I$
$u = -0.937750 + 0.894064I$ $a = -0.136167 + 0.040729I$ $b = 0.033877 - 0.391522I$	$8.81727 + 3.30718I$	$9.73232 - 0.26403I$
$u = -0.937750 - 0.894064I$ $a = -0.136167 - 0.040729I$ $b = 0.033877 + 0.391522I$	$8.81727 - 3.30718I$	$9.73232 + 0.26403I$
$u = 0.329816 + 0.609577I$ $a = 1.36642 + 0.69246I$ $b = 0.666101 + 0.693872I$	$0.93369 + 1.94924I$	$2.26750 - 2.60215I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.329816 - 0.609577I$ $a = 1.36642 - 0.69246I$ $b = 0.666101 - 0.693872I$	$0.93369 - 1.94924I$	$2.26750 + 2.60215I$
$u = 0.608776 + 0.305198I$ $a = 1.34189 - 0.96968I$ $b = 0.380204 - 0.410363I$	$1.64937 - 1.34941I$	$2.63194 + 5.42860I$
$u = 0.608776 - 0.305198I$ $a = 1.34189 + 0.96968I$ $b = 0.380204 + 0.410363I$	$1.64937 + 1.34941I$	$2.63194 - 5.42860I$
$u = 1.143500 + 0.680077I$ $a = 1.81946 + 0.18199I$ $b = 0.70224 - 1.53818I$	$-5.2490 - 16.0451I$	$-4.81305 + 8.97986I$
$u = 1.143500 - 0.680077I$ $a = 1.81946 - 0.18199I$ $b = 0.70224 + 1.53818I$	$-5.2490 + 16.0451I$	$-4.81305 - 8.97986I$
$u = 1.173910 + 0.686395I$ $a = -1.190380 + 0.306818I$ $b = -0.033969 + 1.183180I$	$-5.21816 - 1.33994I$	$-6.48707 + 0.52665I$
$u = 1.173910 - 0.686395I$ $a = -1.190380 - 0.306818I$ $b = -0.033969 - 1.183180I$	$-5.21816 + 1.33994I$	$-6.48707 - 0.52665I$

II.

$$I_2^u = \langle u^{17}+2u^{16}+\cdots+b-u,\ -2u^{18}-2u^{17}+\cdots-a+1,\ u^{19}+2u^{18}+\cdots-2u-1\rangle$$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^2+1 \\ -u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u \\ -u^3+u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^3 \\ u^5-u^3+u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^5+u \\ -u^7+u^5-2u^3+u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ -u^{17}-2u^{16}+\cdots-au+u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^{17}+2u^{16}+\cdots+a-u \\ -u^{17}-2u^{16}+\cdots-au+u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^{18}a+u^{18}+\cdots-au-2u^2 \\ u^{18}a+2u^{17}a+\cdots-u-1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{18}a+u^{18}+\cdots+au+3u^2 \\ u^{16}+u^{15}+\cdots+au-u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^{16}+4u^{14}+\cdots+a-1 \\ u^{18}-5u^{16}+\cdots-au+u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -u^{18}-6u^{17}+5u^{16}+26u^{15}-2u^{14}-63u^{13}-13u^{12}+90u^{11}+53u^{10}-93u^9-89u^8+50u^7+98u^6-6u^5-48u^4-18u^3+7u^2+u+3$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_7	$(u^{19} + 8u^{18} + \cdots - 2u + 1)^2$
c_2, c_6	$(u^{19} + 2u^{18} + \cdots - 2u - 1)^2$
c_3, c_8	$u^{38} - 2u^{37} + \cdots - u + 2$
c_4, c_9	$u^{38} + 14u^{36} + \cdots + 1099u + 139$
c_{10}, c_{12}	$u^{38} + 7u^{37} + \cdots + 513u + 108$
c_{11}	$(u^{19} + 9u^{18} + \cdots - 36u - 8)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$(y^{19} + 8y^{18} + \cdots + 18y - 1)^2$
c_2, c_6	$(y^{19} - 8y^{18} + \cdots - 2y - 1)^2$
c_3, c_8	$y^{38} + 14y^{36} + \cdots + 79y + 4$
c_4, c_9	$y^{38} + 28y^{37} + \cdots + 386251y + 19321$
c_{10}, c_{12}	$y^{38} + 33y^{37} + \cdots - 143289y + 11664$
c_{11}	$(y^{19} - 7y^{18} + \cdots + 912y - 64)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.495132 + 0.903993I$ $a = 0.326792 - 1.156850I$ $b = 0.084217 - 1.225400I$	$-4.57497 - 2.26653I$	$-5.53703 + 1.30901I$
$u = -0.495132 + 0.903993I$ $a = -0.198007 + 1.367670I$ $b = -0.45362 + 1.47333I$	$-4.57497 - 2.26653I$	$-5.53703 + 1.30901I$
$u = -0.495132 - 0.903993I$ $a = 0.326792 + 1.156850I$ $b = 0.084217 + 1.225400I$	$-4.57497 + 2.26653I$	$-5.53703 - 1.30901I$
$u = -0.495132 - 0.903993I$ $a = -0.198007 - 1.367670I$ $b = -0.45362 - 1.47333I$	$-4.57497 + 2.26653I$	$-5.53703 - 1.30901I$
$u = 0.865844 + 0.312367I$ $a = 0.330717 + 1.227550I$ $b = 1.29333 + 1.02623I$	$-2.00068 + 2.76328I$	$-8.14585 - 3.98933I$
$u = 0.865844 + 0.312367I$ $a = 1.60295 + 1.73808I$ $b = -0.202234 - 0.834328I$	$-2.00068 + 2.76328I$	$-8.14585 - 3.98933I$
$u = 0.865844 - 0.312367I$ $a = 0.330717 - 1.227550I$ $b = 1.29333 - 1.02623I$	$-2.00068 - 2.76328I$	$-8.14585 + 3.98933I$
$u = 0.865844 - 0.312367I$ $a = 1.60295 - 1.73808I$ $b = -0.202234 + 0.834328I$	$-2.00068 - 2.76328I$	$-8.14585 + 3.98933I$
$u = 1.008240 + 0.438547I$ $a = -1.46222 - 0.04840I$ $b = -0.203202 - 0.259413I$	$-2.91274 - 5.70416I$	$-9.32023 + 6.32015I$
$u = 1.008240 + 0.438547I$ $a = -1.71663 - 0.83269I$ $b = -0.77453 + 1.51432I$	$-2.91274 - 5.70416I$	$-9.32023 + 6.32015I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.008240 - 0.438547I$ $a = -1.46222 + 0.04840I$ $b = -0.203202 + 0.259413I$	$-2.91274 + 5.70416I$	$-9.32023 - 6.32015I$
$u = 1.008240 - 0.438547I$ $a = -1.71663 + 0.83269I$ $b = -0.77453 - 1.51432I$	$-2.91274 + 5.70416I$	$-9.32023 - 6.32015I$
$u = -1.038990 + 0.393441I$ $a = 1.154670 - 0.111351I$ $b = -0.171518 + 1.354850I$	$-3.09652 + 0.72162I$	$-9.47856 - 1.89123I$
$u = -1.038990 + 0.393441I$ $a = -0.579638 - 0.515808I$ $b = -0.198180 + 0.573068I$	$-3.09652 + 0.72162I$	$-9.47856 - 1.89123I$
$u = -1.038990 - 0.393441I$ $a = 1.154670 + 0.111351I$ $b = -0.171518 - 1.354850I$	$-3.09652 - 0.72162I$	$-9.47856 + 1.89123I$
$u = -1.038990 - 0.393441I$ $a = -0.579638 + 0.515808I$ $b = -0.198180 - 0.573068I$	$-3.09652 - 0.72162I$	$-9.47856 + 1.89123I$
$u = -0.632677 + 0.606994I$ $a = 1.25258 - 0.71231I$ $b = 0.591039 - 0.989300I$	$1.03071 - 3.14319I$	$2.24359 + 4.30108I$
$u = -0.632677 + 0.606994I$ $a = -1.62772 + 1.55849I$ $b = -1.50531 - 0.08884I$	$1.03071 - 3.14319I$	$2.24359 + 4.30108I$
$u = -0.632677 - 0.606994I$ $a = 1.25258 + 0.71231I$ $b = 0.591039 + 0.989300I$	$1.03071 + 3.14319I$	$2.24359 - 4.30108I$
$u = -0.632677 - 0.606994I$ $a = -1.62772 - 1.55849I$ $b = -1.50531 + 0.08884I$	$1.03071 + 3.14319I$	$2.24359 - 4.30108I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.988101 + 0.580996I$ $a = 1.46840 - 1.05539I$ $b = 1.81349 + 0.22469I$	$-0.04803 + 7.86790I$	$-1.22775 - 10.06274I$
$u = -0.988101 + 0.580996I$ $a = -2.10220 + 0.92508I$ $b = -0.557031 - 1.108630I$	$-0.04803 + 7.86790I$	$-1.22775 - 10.06274I$
$u = -0.988101 - 0.580996I$ $a = 1.46840 + 1.05539I$ $b = 1.81349 - 0.22469I$	$-0.04803 - 7.86790I$	$-1.22775 + 10.06274I$
$u = -0.988101 - 0.580996I$ $a = -2.10220 - 0.92508I$ $b = -0.557031 + 1.108630I$	$-0.04803 - 7.86790I$	$-1.22775 + 10.06274I$
$u = 0.875870 + 0.775879I$ $a = 0.541655 - 1.082210I$ $b = 0.060166 - 0.657829I$	$4.39114 - 2.91967I$	$-13.8851 + 7.0340I$
$u = 0.875870 + 0.775879I$ $a = 0.979790 - 0.982545I$ $b = -0.18315 - 1.69701I$	$4.39114 - 2.91967I$	$-13.8851 + 7.0340I$
$u = 0.875870 - 0.775879I$ $a = 0.541655 + 1.082210I$ $b = 0.060166 + 0.657829I$	$4.39114 + 2.91967I$	$-13.8851 - 7.0340I$
$u = 0.875870 - 0.775879I$ $a = 0.979790 + 0.982545I$ $b = -0.18315 + 1.69701I$	$4.39114 + 2.91967I$	$-13.8851 - 7.0340I$
$u = 1.23857$ $a = -0.257034 + 0.567682I$ $b = 0.07595 - 1.57396I$	-11.0179	-9.97210
$u = 1.23857$ $a = -0.257034 - 0.567682I$ $b = 0.07595 + 1.57396I$	-11.0179	-9.97210

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.122560 + 0.674821I$ $a = -1.66618 - 0.22925I$ $b = -0.275014 - 1.270650I$	$-6.49446 + 8.08492I$	$-6.96765 - 5.83653I$
$u = -1.122560 + 0.674821I$ $a = 1.70523 + 0.07261I$ $b = 0.54278 + 1.65806I$	$-6.49446 + 8.08492I$	$-6.96765 - 5.83653I$
$u = -1.122560 - 0.674821I$ $a = -1.66618 + 0.22925I$ $b = -0.275014 + 1.270650I$	$-6.49446 - 8.08492I$	$-6.96765 + 5.83653I$
$u = -1.122560 - 0.674821I$ $a = 1.70523 - 0.07261I$ $b = 0.54278 - 1.65806I$	$-6.49446 - 8.08492I$	$-6.96765 + 5.83653I$
$u = -0.091769 + 0.494960I$ $a = 1.20013 - 0.93318I$ $b = -0.411060 + 0.279588I$	$-0.52471 + 2.63664I$	$-2.19536 - 2.28037I$
$u = -0.091769 + 0.494960I$ $a = 1.04671 + 1.38130I$ $b = 0.473887 + 1.101510I$	$-0.52471 + 2.63664I$	$-2.19536 - 2.28037I$
$u = -0.091769 - 0.494960I$ $a = 1.20013 + 0.93318I$ $b = -0.411060 - 0.279588I$	$-0.52471 - 2.63664I$	$-2.19536 + 2.28037I$
$u = -0.091769 - 0.494960I$ $a = 1.04671 - 1.38130I$ $b = 0.473887 - 1.101510I$	$-0.52471 - 2.63664I$	$-2.19536 + 2.28037I$

III.

$$\boldsymbol{I_3^u = \langle -u^9+u^8+\cdots+b-u,\ -3u^9+3u^8+\cdots+a+2,\ u^{10}-2u^9+\cdots-u+1\rangle}$$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -7u^9+14u^8+3u^7-27u^6+9u^5+30u^4-13u^3-7u^2-3u+5$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{10} - 4u^9 + \cdots - 3u + 1$
c_2	$u^{10} - 2u^9 + 4u^7 - 2u^6 - 4u^5 + 4u^4 + u^3 - u^2 - u + 1$
c_3, c_8	$u^{10} + u^9 + 3u^8 + 2u^7 + 3u^6 + u^5 + 3u^4 + u^3 + u^2 + 1$
c_4, c_9	$u^{10} + u^8 + u^7 + 3u^6 + u^5 + 3u^4 + 2u^3 + 3u^2 + u + 1$
c_6	$u^{10} + 2u^9 - 4u^7 - 2u^6 + 4u^5 + 4u^4 - u^3 - u^2 + u + 1$
c_7	$u^{10} + 4u^9 + \cdots + 3u + 1$
c_{10}, c_{12}	$u^{10} + 2u^9 + 7u^8 + 11u^7 + 19u^6 + 21u^5 + 23u^4 + 18u^3 + 11u^2 + 5u + 1$
c_{11}	$u^{10} + 12u^9 + \cdots + 553u + 119$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$y^{10} + 8y^9 + \cdots + 13y + 1$
c_2, c_6	$y^{10} - 4y^9 + \cdots - 3y + 1$
c_3, c_8	$y^{10} + 5y^9 + 11y^8 + 18y^7 + 23y^6 + 21y^5 + 19y^4 + 11y^3 + 7y^2 + 2y + 1$
c_4, c_9	$y^{10} + 2y^9 + 7y^8 + 11y^7 + 19y^6 + 21y^5 + 23y^4 + 18y^3 + 11y^2 + 5y + 1$
c_{10}, c_{12}	$y^{10} + 10y^9 + \cdots - 3y + 1$
c_{11}	$y^{10} - 4y^9 + \cdots - 10213y + 14161$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.032960 + 0.512793I$ $a = -1.97942 - 0.87039I$ $b = -0.928863 + 0.882694I$	$-1.82490 - 7.04514I$	$-7.00691 + 10.78410I$
$u = 1.032960 - 0.512793I$ $a = -1.97942 + 0.87039I$ $b = -0.928863 - 0.882694I$	$-1.82490 + 7.04514I$	$-7.00691 - 10.78410I$
$u = -1.081750 + 0.414901I$ $a = 0.399098 - 0.224008I$ $b = -0.536015 + 0.989716I$	$-2.42349 - 0.47280I$	$-4.11542 + 3.42753I$
$u = -1.081750 - 0.414901I$ $a = 0.399098 + 0.224008I$ $b = -0.536015 - 0.989716I$	$-2.42349 + 0.47280I$	$-4.11542 - 3.42753I$
$u = 0.620721 + 0.483253I$ $a = 1.37337 + 1.79298I$ $b = 0.853256 + 0.680596I$	$-0.43993 + 2.89386I$	$-3.51583 - 3.73185I$
$u = 0.620721 - 0.483253I$ $a = 1.37337 - 1.79298I$ $b = 0.853256 - 0.680596I$	$-0.43993 - 2.89386I$	$-3.51583 + 3.73185I$
$u = -0.517593 + 0.494789I$ $a = 0.307549 - 0.733697I$ $b = 0.572538 + 0.706393I$	$-0.42431 + 4.26902I$	$-1.71632 - 7.11667I$
$u = -0.517593 - 0.494789I$ $a = 0.307549 + 0.733697I$ $b = 0.572538 - 0.706393I$	$-0.42431 - 4.26902I$	$-1.71632 + 7.11667I$
$u = 0.945660 + 0.933377I$ $a = 0.399398 - 0.395934I$ $b = 0.039085 - 0.697555I$	$8.40249 - 3.42159I$	$-8.64553 + 4.94639I$
$u = 0.945660 - 0.933377I$ $a = 0.399398 + 0.395934I$ $b = 0.039085 + 0.697555I$	$8.40249 + 3.42159I$	$-8.64553 - 4.94639I$

IV.

$\boldsymbol{I_4^u = \langle u^2a+au-u^2+b-u-1,\ -u^2a+a^2-2au+2u^2-a+u+1,\ u^3+u^2-1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6u^2-9u+6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$(y^3+3y^2+2y-1)^2$
c_2, c_6	$(y^3-y^2+2y-1)^2$
c_3, c_4, c_8 c_9	$y^6+9y^5+29y^4+41y^3+29y^2+9y+1$
c_{10}, c_{12}	$(y-1)^6$
c_{11}	y^6

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.877439 + 0.744862I$ $a = 0.565646 + 1.180490I$ $b = 0.048539 + 0.537677I$	$4.66906 + 2.82812I$	$12.60647 + 1.13909I$
$u = -0.877439 + 0.744862I$ $a = -1.10544 - 0.99790I$ $b = 0.16654 - 1.84482I$	$4.66906 + 2.82812I$	$12.60647 + 1.13909I$
$u = -0.877439 - 0.744862I$ $a = 0.565646 - 1.180490I$ $b = 0.048539 - 0.537677I$	$4.66906 - 2.82812I$	$12.60647 - 1.13909I$
$u = -0.877439 - 0.744862I$ $a = -1.10544 + 0.99790I$ $b = 0.16654 + 1.84482I$	$4.66906 - 2.82812I$	$12.60647 - 1.13909I$
$u = 0.754878$ $a = 1.53980 + 0.72359I$ $b = 0.284920 - 0.958551I$	0.531480	-4.21290
$u = 0.754878$ $a = 1.53980 - 0.72359I$ $b = 0.284920 + 0.958551I$	0.531480	-4.21290

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5	$((u^3-u^2+2u-1)^2)(u^{10}-4u^9+\cdots-3u+1)$ $\cdot((u^{19}+8u^{18}+\cdots-2u+1)^2)(u^{27}+11u^{26}+\cdots+113u+16)$
c_2	$(u^3+u^2-1)^2(u^{10}-2u^9+4u^7-2u^6-4u^5+4u^4+u^3-u^2-u+1)$ $\cdot((u^{19}+2u^{18}+\cdots-2u-1)^2)(u^{27}-5u^{26}+\cdots-21u+4)$
c_3, c_8	$(u^6+u^5+5u^4+3u^3+5u^2+u+1)$ $\cdot(u^{10}+u^9+3u^8+2u^7+3u^6+u^5+3u^4+u^3+u^2+1)$ $\cdot(u^{27}-u^{26}+\cdots+u+1)(u^{38}-2u^{37}+\cdots-u+2)$
c_4, c_9	$(u^6+u^5+5u^4+3u^3+5u^2+u+1)$ $\cdot(u^{10}+u^8+u^7+3u^6+u^5+3u^4+2u^3+3u^2+u+1)$ $\cdot(u^{27}+11u^{25}+\cdots+u+2)(u^{38}+14u^{36}+\cdots+1099u+139)$
c_6	$(u^3-u^2+1)^2(u^{10}+2u^9-4u^7-2u^6+4u^5+4u^4-u^3-u^2+u+1)$ $\cdot((u^{19}+2u^{18}+\cdots-2u-1)^2)(u^{27}-5u^{26}+\cdots-21u+4)$
c_7	$((u^3+u^2+2u+1)^2)(u^{10}+4u^9+\cdots+3u+1)$ $\cdot((u^{19}+8u^{18}+\cdots-2u+1)^2)(u^{27}+11u^{26}+\cdots+113u+16)$
c_{10}, c_{12}	$(u-1)^6$ $\cdot(u^{10}+2u^9+7u^8+11u^7+19u^6+21u^5+23u^4+18u^3+11u^2+5u+1)$ $\cdot(u^{27}-4u^{26}+\cdots+26u+1)(u^{38}+7u^{37}+\cdots+513u+108)$
c_{11}	$u^6(u^{10}+12u^9+\cdots+553u+119)(u^{19}+9u^{18}+\cdots-36u-8)^2$ $\cdot(u^{27}-17u^{26}+\cdots+17u-2)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$((y^3+3y^2+2y-1)^2)(y^{10}+8y^9+\cdots+13y+1)$ $\cdot((y^{19}+8y^{18}+\cdots+18y-1)^2)(y^{27}+13y^{26}+\cdots-1791y-256)$
c_2, c_6	$((y^3-y^2+2y-1)^2)(y^{10}-4y^9+\cdots-3y+1)$ $\cdot((y^{19}-8y^{18}+\cdots-2y-1)^2)(y^{27}-11y^{26}+\cdots+113y-16)$
c_3, c_8	$(y^6+9y^5+29y^4+41y^3+29y^2+9y+1)$ $\cdot(y^{10}+5y^9+11y^8+18y^7+23y^6+21y^5+19y^4+11y^3+7y^2+2y+1)$ $\cdot(y^{27}+17y^{26}+\cdots-25y-1)(y^{38}+14y^{36}+\cdots+79y+4)$
c_4, c_9	$(y^6+9y^5+29y^4+41y^3+29y^2+9y+1)$ $\cdot(y^{10}+2y^9+7y^8+11y^7+19y^6+21y^5+23y^4+18y^3+11y^2+5y+1)$ $\cdot(y^{27}+22y^{26}+\cdots-51y-4)(y^{38}+28y^{37}+\cdots+386251y+19321)$
c_{10}, c_{12}	$((y-1)^6)(y^{10}+10y^9+\cdots-3y+1)(y^{27}+22y^{26}+\cdots+1168y-1)$ $\cdot(y^{38}+33y^{37}+\cdots-143289y+11664)$
c_{11}	$y^6(y^{10}-4y^9+\cdots-10213y+14161)$ $\cdot((y^{19}-7y^{18}+\cdots+912y-64)^2)(y^{27}-11y^{26}+\cdots+141y-4)$