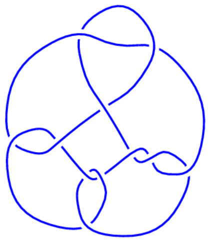
$11a_{47}$ $(K11a_{47})$



[1]

Arc Sequences

$\rightarrow \downarrow_{4} \rightarrow \downarrow_{1} \rightarrow \uparrow_{8} \rightarrow \downarrow_{2} \rightarrow \uparrow_{11} \rightarrow \downarrow_{9} \rightarrow \uparrow_{3} \rightarrow \downarrow_{10} \rightarrow \downarrow_{7} \rightarrow \uparrow_{5} \rightarrow \uparrow_{6} \rightarrow$

4 1 8 2 11 9 3 10 7 5 6

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{8} I_i^u \bigcap I_1^v$$

[1] The knot diagram image is adapter from "C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, http://www.indiana.edu/ knotinfo"

$I_1^u = \langle a,\ u-1,\ d+c-1,\ cb+1\rangle$
$I_2^u = \langle a,\ c,\ b-1,\ d-1,\ u-1\rangle$
$I_3^u = \langle a,\ c-1,\ u-1,\ d+1,\ b+1\rangle$
$I_4^u = \langle u^4+b,\ -u^2+d,\ u^2+c-1,\ -u^4+u^2+a-1,\ u^6+u^5-u^4-2u^3+u+1\rangle$
$I_5^u = \langle c^{12}+7c^{11}+37c^{10}+125c^9+301c^8+563c^7+855c^6+1020c^5+986c^4+748c^3+504c^2+277c+137,$
$-360449610467c^{11}-2239492377762c^{10}+\cdots+16501719305943a-35208293717353,$
$56083107757c^{11}+408621304548c^{10}+\cdots+55005731019816b+9355307354771,$
$-137214226835c^{11}+16501719305943d+\cdots+23477181903284c+13375366451981,$
$-92559389066c^{11}+16501719305943u+\cdots+14724871632887c+15975316836953\rangle$
$I_6^u = \langle -u^2+d,\ u^2+c-1,\ u^7-2u^5-u^4+u^2+a+2u+1,\ -u^9+u^7+2u^6+u^5-u^4-2u^3-2u^2+b-u,$
$u^{12}-u^{11}-4u^{10}+2u^9+7u^8+u^7-5u^6-5u^5-u^4+3u^3+2u^2+1\rangle$
$I_7^u = \langle u^{16}+u^{15}-3u^{14}-5u^{13}+3u^{12}+9u^{11}+2u^{10}-8u^9-6u^8+2u^7+5u^6+u^5-u^4+2u^3+3u^2-4u-4,$
$-271u^{15}-165u^{14}+\cdots+2360a+162,\ -581u^{15}+93u^{14}+\cdots+1180b+3350,$
$-99u^{15}-197u^{14}+\cdots+2360c-34,\ 173u^{15}+57u^{14}+\cdots+590d-204\rangle$
$I_8^u = \langle u^{17}-3u^{15}-2u^{14}+4u^{13}+4u^{12}+u^{11}-4u^{10}-5u^9-2u^8+5u^7+4u^6+u^5-u^4-u^3+4u^2+4d+u-3,$
$u^{18}+u^{17}+\cdots+2b-1,\ u^{19}+2u^{18}+\cdots+3u+1,\ -2u^{18}-3u^{17}+\cdots+2a-4,$
$-u^{18}-2u^{17}+\cdots+2c-5\rangle$

$I_1^v = \langle b,\ c,\ d-1,\ v-1,\ a-1\rangle$

There are 9 irreducible components with 68 representations.
There are 1 irreducible components of $dim_{\mathbb{C}} = 1$ for $11a_{47}$

I. $I_1^u = \langle a,\ u-1,\ d+c-1,\ cb+1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_4 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-1\\1\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}c\\-c+1\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}c+1\\-c\end{pmatrix}$$
$$a_6 = \begin{pmatrix}c\\-c+1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}1\\-1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0\\b\end{pmatrix}$$
$$a_3 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0\\b\end{pmatrix}$$
$$a_9 = \begin{pmatrix}c\\-c+b+1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}c\\-c+b+1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$ $c = \cdots$ $d = \cdots$	-1.64493	$-1.106145 + 0.511900I$

II. $I_2^u = \langle a,\ c,\ b-1,\ d-1,\ u-1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_4 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-1\\1\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}1\\-1\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_3 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}0\\1\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

	Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000		
$a =$	0		
$b =$	1.00000	0	0
$c =$	0		
$d =$	1.00000		

III. $\boldsymbol{I_3^u = \langle a,\ c-1,\ u-1,\ d+1,\ b+1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$

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

$$a_5 = \begin{pmatrix}-1\\1\end{pmatrix}$$

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

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

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

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

$$a_8 = \begin{pmatrix}0\\-1\end{pmatrix}$$

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

$$a_7 = \begin{pmatrix}0\\-1\end{pmatrix}$$

$$a_9 = \begin{pmatrix}1\\-2\end{pmatrix}$$

$$a_9 = \begin{pmatrix}1\\-2\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0$ $b = -1.00000$ $c = 1.00000$ $d = -1.00000$	-3.28987	-12.0000

IV.

$\boldsymbol{I^u_4 = \langle u^4+b,\ -u^2+d,\ u^2+c-1,\ -u^4+u^2+a-1,\ u^6+u^5-u^4-2u^3+u+1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I^u_4	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.073950-0.558752I$ $a=-0.573950+0.818891I$ $b=\ 0.73279-2.01903I$ $c=\ 0.158836-1.200143I$ $d=\ 0.84116+1.20014I$	$-5.69302I$	$5.51057I$
$u=-1.073950+0.558752I$ $a=-0.573950-0.818891I$ $b=\ 0.73279+2.01903I$ $c=\ 0.158836+1.200143I$ $d=\ 0.84116-1.20014I$	$5.69302I$	$-5.51057I$
$u=-0.428243-0.664531I$ $a=\ 1.000936-0.863088I$ $b=\ 0.257273+0.293926I$ $c=\ 1.258209-0.569162I$ $d=-0.258209+0.569162I$	$1.89061+0.92430I$	$3.71672-0.79423I$
$u=-0.428243+0.664531I$ $a=\ 1.000936+0.863088I$ $b=\ 0.257273-0.293926I$ $c=\ 1.258209+0.569162I$ $d=-0.258209-0.569162I$	$1.89061-0.92430I$	$3.71672+0.79423I$
$u=\ 1.002193-0.295542I$ $a=\ 0.573013-0.494098I$ $b=-0.490059+1.086478I$ $c=\ 0.082955+0.592379I$ $d=\ 0.917045-0.592379I$	$-1.89061+0.92430I$	$-3.71672-0.79423I$
$u=\ 1.002193+0.295542I$ $a=\ 0.573013+0.494098I$ $b=-0.490059-1.086478I$ $c=\ 0.082955-0.592379I$ $d=\ 0.917045+0.592379I$	$-1.89061-0.92430I$	$-3.71672+0.79423I$

V. $I^u_5 = \langle c^{12} + 7c^{11} + \cdots + 277c + 137,\ -3.60 \times 10^{11}c^{11} - 2.24 \times 10^{12}c^{10} + \cdots + 1.65 \times 10^{13}a - 3.52 \times 10^{13},\ 5.61 \times 10^{10}c^{11} + 4.09 \times 10^{11}c^{10} + \cdots + 5.50 \times 10^{12}b + 9.36 \times 10^{12},\ 1.65 \times 10^{13}d - 1.37 \times 10^{11}c^{11} + \cdots + 2.35 \times 10^{13}c + 1.34 \times 10^{13},\ 1.65 \times 10^{13}u - 9.26 \times 10^{10}c^{11} + \cdots + 1.47 \times 10^{13}c + 1.60 \times 10^{13}\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ 0.00560908c^{11} + 0.0192675c^{10} + \cdots - 0.892323c - 0.968100 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.00560908c^{11} - 0.0192675c^{10} + \cdots + 0.892323c + 0.968100 \\ 0.00560908c^{11} + 0.0192675c^{10} + \cdots - 0.892323c - 0.968100 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} c \\ 0.00831515c^{11} + 0.0396045c^{10} + \cdots - 1.42271c - 0.810544 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -0.00184239c^{11} - 0.00931661c^{10} + \cdots + 0.279479c + 0.285527 \\ 0.0101575c^{11} + 0.0489212c^{10} + \cdots - 0.702190c - 1.09607 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.000872373c^{11} + 0.0198965c^{10} + \cdots + 2.00425c + 1.76513 \\ -0.00700307c^{11} - 0.0495165c^{10} + \cdots - 1.93598c - 0.956306 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ 0.0116473c^{11} + 0.0614256c^{10} + \cdots + 0.422287c - 0.567174 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.0218432c^{11} + 0.135713c^{10} + \cdots + 3.86882c + 2.13361 \\ -0.0101959c^{11} - 0.0742870c^{10} + \cdots - 3.44653c - 1.70079 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.0116473c^{11} + 0.0614256c^{10} + \cdots + 0.422287c + 0.432826 \\ 0.0101959c^{11} + 0.0742870c^{10} + \cdots + 3.44653c + 1.70079 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.00560908c^{11} + 0.0192675c^{10} + \cdots - 0.892323c - 0.968100 \\ -0.00560908c^{11} - 0.0192675c^{10} + \cdots + 0.892323c + 0.968100 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.00184239c^{11} - 0.00931661c^{10} + \cdots + 0.279479c + 0.285527 \\ 0.0101575c^{11} + 0.0489212c^{10} + \cdots - 0.702190c - 1.09607 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.00184239c^{11} - 0.00931661c^{10} + \cdots + 0.279479c + 0.285527 \\ 0.0101575c^{11} + 0.0489212c^{10} + \cdots - 0.702190c - 1.09607 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.428243 + 0.664531I$ $a = 1.000936 + 0.863088I$ $b = 0.257273 - 0.293926I$ $c = -1.64624 - 0.72836I$ $d = 0.590678 - 0.583006I$	$1.89061 - 0.92430I$	$3.71672 + 0.79423I$
$u = -0.428243 - 0.664531I$ $a = 1.000936 - 0.863088I$ $b = 0.257273 + 0.293926I$ $c = -1.64624 + 0.72836I$ $d = 0.590678 + 0.583006I$	$1.89061 + 0.92430I$	$3.71672 - 0.79423I$
$u = -0.428243 - 0.664531I$ $a = 1.000936 - 0.863088I$ $b = 0.257273 + 0.293926I$ $c = -0.931516 - 0.756104I$ $d = 0.987076 - 0.555260I$	$1.89061 + 0.92430I$	$3.71672 - 0.79423I$
$u = -0.428243 + 0.664531I$ $a = 1.000936 + 0.863088I$ $b = 0.257273 - 0.293926I$ $c = -0.931516 + 0.756104I$ $d = 0.987076 + 0.555260I$	$1.89061 - 0.92430I$	$3.71672 + 0.79423I$
$u = 1.002193 + 0.295542I$ $a = 0.573013 + 0.494098I$ $b = -0.490059 - 1.086478I$ $c = -0.86373 - 3.45204I$ $d = -0.14460 + 3.94091I$	$-1.89061 - 0.92430I$	$-3.71672 + 0.79423I$
$u = 1.002193 - 0.295542I$ $a = 0.573013 - 0.494098I$ $b = -0.490059 + 1.086478I$ $c = -0.86373 + 3.45204I$ $d = -0.14460 - 3.94091I$	$-1.89061 + 0.92430I$	$-3.71672 - 0.79423I$

Solution to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.073950 + 0.558752I$ $a = -0.573950 - 0.818891I$ $b = 0.73279 + 2.01903I$ $c = -0.509721 - 1.113504I$ $d = 0.40051 + 1.82841I$	$5.69302I$	$-5.51057I$
$u = -1.073950 - 0.558752I$ $a = -0.573950 + 0.818891I$ $b = 0.73279 - 2.01903I$ $c = -0.509721 + 1.113504I$ $d = 0.40051 - 1.82841I$	$-5.69302I$	$5.51057I$
$u = -1.073950 - 0.558752I$ $a = -0.573950 + 0.818891I$ $b = 0.73279 - 2.01903I$ $c = 0.13413 - 1.55114I$ $d = -1.02492 + 2.26605I$	$-5.69302I$	$5.51057I$
$u = -1.073950 + 0.558752I$ $a = -0.573950 - 0.818891I$ $b = 0.73279 + 2.01903I$ $c = 0.13413 + 1.55114I$ $d = -1.02492 - 2.26605I$	$5.69302I$	$-5.51057I$
$u = 1.002193 - 0.295542I$ $a = 0.573013 - 0.494098I$ $b = -0.490059 + 1.086478I$ $c = 0.317076 - 0.733138I$ $d = -0.308747 + 1.222005I$	$-1.89061 + 0.92430I$	$-3.71672 - 0.79423I$
$u = 1.002193 + 0.295542I$ $a = 0.573013 + 0.494098I$ $b = -0.490059 - 1.086478I$ $c = 0.317076 + 0.733138I$ $d = -0.308747 - 1.222005I$	$-1.89061 - 0.92430I$	$-3.71672 + 0.79423I$

VI. $I_6^u = \langle -u^2 + d,\ u^2 + c - 1,\ u^7 - 2u^5 + \cdots + a + 1,\ -u^9 + u^7 + \cdots + b - u,\ u^{12} - u^{11} + \cdots + 2u^2 + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_6^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.155020-0.191936I$ $a=-0.267765+0.619837I$ $b=-0.38259-3.72805I$ $c=-0.297233-0.443379I$ $d=\ \ 1.297233+0.443379I$	$-1.89061+0.92430I$	$-3.71672-0.79423I$
$u=-1.155020+0.191936I$ $a=-0.267765-0.619837I$ $b=-0.38259+3.72805I$ $c=-0.297233+0.443379I$ $d=\ \ 1.297233-0.443379I$	$-1.89061-0.92430I$	$-3.71672+0.79423I$
$u=-0.895235-0.524661I$ $a=\ \ 0.689262-0.734076I$ $b=-0.14376+1.46753I$ $c=\ \ 0.473823-0.939391I$ $d=\ \ 0.526177+0.939391I$	$1.89061-0.92430I$	$3.71672+0.79423I$
$u=-0.895235+0.524661I$ $a=\ \ 0.689262+0.734076I$ $b=-0.14376-1.46753I$ $c=\ \ 0.473823+0.939391I$ $d=\ \ 0.526177-0.939391I$	$1.89061+0.92430I$	$3.71672-0.79423I$
$u=-0.282166-0.828798I$ $a=-0.999480+0.955518I$ $b=-0.416114-0.026273I$ $c=\ \ 1.60729-0.46772I$ $d=-0.607288+0.467717I$	$5.69302I$	$-5.51057I$
$u=-0.282166+0.828798I$ $a=-0.999480-0.955518I$ $b=-0.416114+0.026273I$ $c=\ \ 1.60729+0.46772I$ $d=-0.607288-0.467717I$	$-5.69302I$	$5.51057I$

Solution to I_6^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.152828 - 0.487477I$ $a = -0.99044 + 1.18900I$ $b = -0.497742 - 0.515052I$ $c = 1.214278 + 0.149000I$ $d = -0.214278 - 0.149000I$	$-1.89061 - 0.92430I$	$-3.71672 + 0.79423I$
$u = 0.152828 + 0.487477I$ $a = -0.99044 - 1.18900I$ $b = -0.497742 + 0.515052I$ $c = 1.214278 - 0.149000I$ $d = -0.214278 + 0.149000I$	$-1.89061 + 0.92430I$	$-3.71672 - 0.79423I$
$u = 1.323479 - 0.139870I$ $a = -0.772216 + 0.141696I$ $b = 1.72245 - 0.63219I$ $c = -0.732032 + 0.370229I$ $d = 1.73203 - 0.37023I$	$1.89061 - 0.92430I$	$3.71672 + 0.79423I$
$u = 1.323479 + 0.139870I$ $a = -0.772216 - 0.141696I$ $b = 1.72245 + 0.63219I$ $c = -0.732032 - 0.370229I$ $d = 1.73203 + 0.37023I$	$1.89061 + 0.92430I$	$3.71672 - 0.79423I$
$u = 1.356115 - 0.270046I$ $a = 0.840643 - 0.244625I$ $b = -1.78224 + 1.23026I$ $c = -0.766124 + 0.732426I$ $d = 1.76612 - 0.73243I$	$-5.69302I$	$5.51057I$
$u = 1.356115 + 0.270046I$ $a = 0.840643 + 0.244625I$ $b = -1.78224 - 1.23026I$ $c = -0.766124 - 0.732426I$ $d = 1.76612 + 0.73243I$	$5.69302I$	$-5.51057I$

VII. $\boldsymbol{I_7^u = \langle u^{16} + u^{15} + \cdots - 4u - 4,\ -271u^{15} - 165u^{14} + \cdots + 2360a + 162,\ -581u^{15} + 93u^{14} + \cdots + 1180b + 3350,\ -99u^{15} - 197u^{14} + \cdots + 2360c - 34,\ 173u^{15} + 57u^{14} + \cdots + 590d - 204\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -u \\ u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0419492u^{15} + 0.0834746u^{14} + \cdots + 0.210593u + 0.0144068 \\ -0.293220u^{15} - 0.0966102u^{14} + \cdots - 0.245763u + 0.345763 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.102119u^{15} + 0.0614407u^{14} + \cdots + 0.158051u + 0.966949 \\ -0.149153u^{15} - 0.0745763u^{14} + \cdots - 0.193220u - 0.606780 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.151695u^{15} - 0.300847u^{14} + \cdots - 0.163559u + 0.413559 \\ 0.163559u^{15} + 0.456780u^{14} + \cdots + 0.558475u - 0.408475 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0.114831u^{15} + 0.0699153u^{14} + \cdots + 0.693644u - 0.0686441 \\ 0.492373u^{15} - 0.0788136u^{14} + \cdots - 0.211017u - 2.83898 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} 0.0936441u^{15} - 0.115678u^{14} + \cdots + 0.674153u - 0.199153 \\ 0.336441u^{15} + 0.0432203u^{14} + \cdots + 0.941525u - 1.59153 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.146610u^{15} + 0.0483051u^{14} + \cdots + 0.622881u - 0.172881 \\ 0.353390u^{15} - 0.0483051u^{14} + \cdots - 0.122881u - 2.32712 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.146610u^{15} + 0.0483051u^{14} + \cdots + 0.622881u - 0.172881 \\ 0.353390u^{15} - 0.0483051u^{14} + \cdots - 0.122881u - 2.32712 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_7^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.157569 - 0.635502I$ $a = 0.557421 - 0.896927I$ $b = -1.27411 + 2.07243I$ $c = 0.63638 - 1.29602I$ $d = -1.46293 + 2.03683I$	$5.44991 - 9.88301I$	$3.28252 + 6.06963I$
$u = -1.157569 + 0.635502I$ $a = 0.557421 + 0.896927I$ $b = -1.27411 - 2.07243I$ $c = 0.63638 + 1.29602I$ $d = -1.46293 - 2.03683I$	$5.44991 + 9.88301I$	$3.28252 - 6.06963I$
$u = -1.076279 - 0.402850I$ $a = 0.496617 - 0.712709I$ $b = -0.12673 + 2.50547I$ $c = 0.018628 + 1.062865I$ $d = -0.10060 - 1.65754I$	$-4.77492 - 2.26376I$	$-6.05872 + 4.53378I$
$u = -1.076279 + 0.402850I$ $a = 0.496617 + 0.712709I$ $b = -0.12673 - 2.50547I$ $c = 0.018628 - 1.062865I$ $d = -0.10060 + 1.65754I$	$-4.77492 + 2.26376I$	$-6.05872 - 4.53378I$
$u = -0.783583$ $a = -0.701860$ $b = -2.11028$ $c = 0.560255$ $d = -0.122887$	-2.57083	2.16015
$u = -0.754559 - 0.841472I$ $a = -0.820135 + 0.914602I$ $b = 0.604123 - 0.352309I$ $c = -0.535511 + 0.275794I$ $d = -0.355898 + 0.718293I$	10.1546	6.33746

Solution to I^u_7	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.754559 + 0.841472I$ $a = -0.820135 - 0.914602I$ $b = \ \ 0.604123 + 0.352309I$ $c = -0.535511 - 0.275794I$ $d = -0.355898 - 0.718293I$	10.1546	6.33746
$u = -0.270006 - 0.967768I$ $a = \ \ 0.980795 - 0.982086I$ $b = \ \ 0.487066 - 0.220623I$ $c = -1.28957 + 1.26937I$ $d = \ \ 0.589201 + 0.010347I$	$5.44991 + 9.88301I$	$3.28252 - 6.06963I$
$u = -0.270006 + 0.967768I$ $a = \ \ 0.980795 + 0.982086I$ $b = \ \ 0.487066 + 0.220623I$ $c = -1.28957 - 1.26937I$ $d = \ \ 0.589201 - 0.010347I$	$5.44991 - 9.88301I$	$3.28252 + 6.06963I$
$u = \ \ 0.365525 - 0.776365I$ $a = \ \ 0.923174 - 0.991527I$ $b = \ \ 0.895563 + 0.792065I$ $c = -1.43774 - 0.96789I$ $d = \ \ 0.544344 - 0.362514I$	$2.93531 - 3.55755I$	$2.52739 + 2.62489I$
$u = \ \ 0.365525 + 0.776365I$ $a = \ \ 0.923174 + 0.991527I$ $b = \ \ 0.895563 - 0.792065I$ $c = -1.43774 + 0.96789I$ $d = \ \ 0.544344 + 0.362514I$	$2.93531 + 3.55755I$	$2.52739 - 2.62489I$
$u = \ \ 0.993914 - 0.569061I$ $a = -0.795774 + 0.630139I$ $b = \ \ 0.15894 - 1.76185I$ $c = -0.257812 + 1.346396I$ $d = -0.68234 - 2.09325I$	$2.93531 + 3.55755I$	$2.52739 - 2.62489I$

Solution to I_7^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.993914 + 0.569061I$ $a = -0.795774 - 0.630139I$ $b = 0.15894 + 1.76185I$ $c = -0.257812 - 1.346396I$ $d = -0.68234 + 2.09325I$	$2.93531 - 3.55755I$	$2.52739 + 2.62489I$
$u = 1.12630$ $a = 0.488295$ $b = -0.878073$ $c = 1.95645$ $d = -2.26074$	-2.57083	2.16015
$u = 1.227616 - 0.270214I$ $a = -0.735315 + 0.300028I$ $b = 1.24932 - 1.12484I$ $c = 0.60727 - 1.55946I$ $d = -0.83996 + 2.05652I$	$-4.77492 - 2.26376I$	$-6.05872 + 4.53378I$
$u = 1.227616 + 0.270214I$ $a = -0.735315 - 0.300028I$ $b = 1.24932 + 1.12484I$ $c = 0.60727 + 1.55946I$ $d = -0.83996 - 2.05652I$	$-4.77492 + 2.26376I$	$-6.05872 - 4.53378I$

VIII. $\boldsymbol{I^u_8 = \langle u^{17} - 3u^{15} + \cdots + 4d - 3,\ u^{18} + u^{17} + \cdots + 2b - 1,\ u^{19} + 2u^{18} + \cdots + 3u + 1,\ -2u^{18} - 3u^{17} + \cdots + 2a - 4,\ -u^{18} - 2u^{17} + \cdots + 2c - 5\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{1}{2}u^{18} + u^{17} + \cdots - u + \frac{5}{2} \\ -\frac{1}{4}u^{17} + \frac{3}{4}u^{15} + \cdots - \frac{1}{4}u + \frac{3}{4} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} \frac{1}{2}u^{18} + \frac{3}{4}u^{17} + \cdots - \frac{3}{4}u + \frac{11}{4} \\ -\frac{1}{2}u^{15} + 2u^{13} + \cdots - \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{2}u^{18} - u^{17} + \cdots + u - 2 \\ -\frac{1}{4}u^{18} - \frac{1}{2}u^{17} + \cdots + \frac{5}{4}u - \frac{1}{2} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^{18} + \frac{3}{2}u^{17} + \cdots - \frac{1}{2}u + 2 \\ -\frac{1}{2}u^{18} - \frac{1}{2}u^{17} + \cdots - \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^2 + 1 \\ u^4 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} \frac{1}{2}u^{18} + u^{17} + \cdots - \frac{1}{2}u + \frac{3}{2} \\ -\frac{1}{2}u^{15} + u^{13} + \cdots - \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{2}u^{18} + u^{17} + \cdots - u + 2 \\ -\frac{1}{4}u^{17} - \frac{1}{2}u^{16} + \cdots + \frac{1}{4}u + \frac{3}{4} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{2}u^{18} + u^{17} + \cdots - u + 2 \\ -\frac{1}{4}u^{17} - \frac{1}{2}u^{16} + \cdots + \frac{1}{4}u + \frac{3}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_8^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.219915 - 0.612443I$ $a = -0.516047 + 0.911869I$ $b = 1.40218 - 2.37571I$ $c = 0.88613 - 1.46384I$ $d = -1.68494 + 2.18403I$	$2.5538 - 15.5977I$	$0.09598 + 9.40344I$
$u = -1.219915 + 0.612443I$ $a = -0.516047 - 0.911869I$ $b = 1.40218 + 2.37571I$ $c = 0.88613 + 1.46384I$ $d = -1.68494 - 2.18403I$	$2.5538 + 15.5977I$	$0.09598 - 9.40344I$
$u = -1.163712 - 0.575900I$ $a = 0.528681 - 0.867726I$ $b = -1.07974 + 2.29207I$ $c = -0.55106 + 1.42435I$ $d = 0.38413 - 2.13228I$	$-2.61225 - 10.89709I$	$-3.23641 + 8.50579I$
$u = -1.163712 + 0.575900I$ $a = 0.528681 + 0.867726I$ $b = -1.07974 - 2.29207I$ $c = -0.55106 - 1.42435I$ $d = 0.38413 + 2.13228I$	$-2.61225 + 10.89709I$	$-3.23641 - 8.50579I$
$u = -0.892218 - 0.798617I$ $a = 0.745739 - 0.908893I$ $b = -0.917511 + 0.756234I$ $c = -0.171773 - 0.152659I$ $d = -0.711062 + 1.057967I$	$9.74824 - 5.99256I$	$5.35093 + 5.49640I$
$u = -0.892218 + 0.798617I$ $a = 0.745739 + 0.908893I$ $b = -0.917511 - 0.756234I$ $c = -0.171773 + 0.152659I$ $d = -0.711062 - 1.057967I$	$9.74824 + 5.99256I$	$5.35093 - 5.49640I$

Solution to I_8^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.713652-0.621261I$ $a=-0.837060+0.785608I$ $b=\ \ 0.081748-0.770811I$ $c=-0.755312+0.014797I$ $d=\ \ 0.830029-0.977305I$	$2.40223-3.63220I$	$3.52732+6.81616I$
$u=-0.713652+0.621261I$ $a=-0.837060-0.785608I$ $b=\ \ 0.081748+0.770811I$ $c=-0.755312-0.014797I$ $d=\ \ 0.830029+0.977305I$	$2.40223+3.63220I$	$3.52732-6.81616I$
$u=-0.379493-0.913957I$ $a=-0.963127+0.958960I$ $b=-0.245388+0.138357I$ $c=-1.20852+1.09732I$ $d=\ \ 0.418501+0.149638I$	$7.80660+4.21764I$	$6.24313-1.77538I$
$u=-0.379493+0.913957I$ $a=-0.963127-0.958960I$ $b=-0.245388-0.138357I$ $c=-1.20852-1.09732I$ $d=\ \ 0.418501-0.149638I$	$7.80660-4.21764I$	$6.24313+1.77538I$
$u=-0.266152$ $a=\ \ 1.86845$ $b=\ \ 0.545293$ $c=\ \ 2.41374$ $d=\ \ 0.742345$	1.20822	9.19790
$u=\ \ 0.587370-0.660248I$ $a=-0.821562+0.916371I$ $b=-0.609822-1.161649I$ $c=-1.43138-0.24528I$ $d=\ \ 0.357611-0.863012I$	$4.14406+1.22871I$	$4.10945-3.37998I$

Solution to I_8^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.587370 + 0.660248I$ $a = -0.821562 - 0.916371I$ $b = -0.609822 + 1.161649I$ $c = -1.43138 + 0.24528I$ $d = 0.357611 + 0.863012I$	$4.14406 - 1.22871I$	$4.10945 + 3.37998I$
$u = 0.710407 - 0.203370I$ $a = 0.342230 - 0.841271I$ $b = -0.002742 + 0.868397I$ $c = 0.339488 + 0.027126I$ $d = 0.176169 + 0.449965I$	$-1.32552 + 1.22673I$	$-3.58366 - 5.47914I$
$u = 0.710407 + 0.203370I$ $a = 0.342230 + 0.841271I$ $b = -0.002742 - 0.868397I$ $c = 0.339488 - 0.027126I$ $d = 0.176169 - 0.449965I$	$-1.32552 - 1.22673I$	$-3.58366 + 5.47914I$
$u = 1.085303 - 0.470880I$ $a = -0.766359 + 0.526722I$ $b = 0.55681 - 1.65227I$ $c = -0.209548 - 1.125546I$ $d = 0.11074 + 1.77582I$	$-4.29720 + 4.85510I$	$-5.63265 - 5.33490I$
$u = 1.085303 + 0.470880I$ $a = -0.766359 - 0.526722I$ $b = 0.55681 + 1.65227I$ $c = -0.209548 + 1.125546I$ $d = 0.11074 - 1.77582I$	$-4.29720 - 4.85510I$	$-5.63265 + 5.33490I$
$u = 1.118985 - 0.584861I$ $a = 0.853281 - 0.557689I$ $b = -0.45818 + 2.04080I$ $c = 0.39510 + 1.48312I$ $d = -1.25236 - 2.20391I$	$0.71510 + 8.68076I$	$-0.47305 - 6.48182I$

Solution to I_8^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.118985 + 0.584861I$ $a = 0.853281 + 0.557689I$ $b = -0.45818 - 2.04080I$ $c = 0.39510 - 1.48312I$ $d = -1.25236 + 2.20391I$	$0.71510 - 8.68076I$	$-0.47305 + 6.48182I$

IX. $I_1^v = \langle b,\ c,\ d-1,\ v-1,\ a-1 \rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

	Solution to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	1.00000		
$a =$	1.00000		
$b =$	0	0	0
$c =$	0		
$d =$	1.00000		

X. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_4	$u(u-1)^3(u^6+u^5-u^4-2u^3+u+1)^3$ $(u^{12}-u^{11}-4u^{10}+2u^9+7u^8+u^7-5u^6-5u^5-u^4+3u^3+2u^2+1)$ $(u^{16}+u^{15}+\cdots-4u-4)(u^{19}+2u^{18}+\cdots+3u+1)$
c_2	$u(u+1)^3(u^6+3u^5+5u^4+4u^3+2u^2+u+1)^3$ $(u^{12}+9u^{11}+\cdots-4u+1)(u^{16}+7u^{15}+\cdots+40u+16)$ $(u^{19}+8u^{18}+\cdots+19u+1)$
c_3, c_7	$u^4(u^6+u^5-u^4-2u^3+u+1)^5$ $(u^8-3u^7+3u^6+2u^5-8u^4+9u^3-3u^2-2u+2)^2$ $(u^{19}+2u^{18}+\cdots+4u^2-8)$
c_5	$u(u-1)(u+1)^2(u^6-u^5-u^4+2u^3-u+1)$ $(u^8+u^7-4u^6-3u^5+5u^4+u^3-u^2+3u-1)^2$ $(u^{12}+u^{11}-4u^{10}-2u^9+7u^8-u^7-5u^6+5u^5-u^4-3u^3+2u^2+1)^2$ $(u^{19}+2u^{18}+\cdots-8u-4)$
c_6, c_9	$u(u-1)^2(u+1)(u^6+u^5-u^4-2u^3+u+1)^3$ $(u^{12}-u^{11}-4u^{10}+2u^9+7u^8+u^7-5u^6-5u^5-u^4+3u^3+2u^2+1)$ $(u^{16}+u^{15}+\cdots-4u-4)(u^{19}+2u^{18}+\cdots+3u+1)$
c_8	$u(u-1)(u+1)^2(u^6+3u^5+5u^4+4u^3+2u^2+u+1)^3$ $(u^{12}+9u^{11}+\cdots-4u+1)(u^{16}+7u^{15}+\cdots+40u+16)$ $(u^{19}+8u^{18}+\cdots+19u+1)$
c_{10}, c_{11}	$u(u+1)^3(u^6-u^5-u^4+2u^3-u+1)$ $(u^8+u^7-4u^6-3u^5+5u^4+u^3-u^2+3u-1)^2$ $(u^{12}+u^{11}-4u^{10}-2u^9+7u^8-u^7-5u^6+5u^5-u^4-3u^3+2u^2+1)^2$ $(u^{19}+2u^{18}+\cdots-8u-4)$

XI. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4, c_6 c_9	$y(y-1)^3(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^3$ $(y^{12}-9y^{11}+\cdots+4y+1)(y^{16}-7y^{15}+\cdots-40y+16)$ $(y^{19}-8y^{18}+\cdots+19y-1)$
c_2, c_8	$y(y-1)^3(y^6+y^5+5y^4+6y^2+3y+1)^3$ $(y^{12}-13y^{11}+\cdots-12y+1)(y^{16}+y^{15}+\cdots-544y+256)$ $(y^{19}+12y^{18}+\cdots+195y-1)$
c_3, c_7	$y^4(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^5$ $(y^8-3y^7+5y^6-4y^5+2y^4-13y^3+13y^2-16y+4)^2$ $(y^{19}-6y^{18}+\cdots+64y-64)$
c_5, c_{10}, c_{11}	$y(y-1)^3(y^6-3y^5+5y^4-4y^3+2y^2-y+1)$ $(y^8-9y^7+32y^6-53y^5+31y^4+15y^3-15y^2-7y+1)^2$ $(1+4y+2y^2-23y^3+25y^4-y^5-5y^6-33y^7+73y^8-68y^9+34y^{10}-9y^{11}+y^{12})^2$ $(y^{19}-18y^{18}+\cdots+88y-16)$