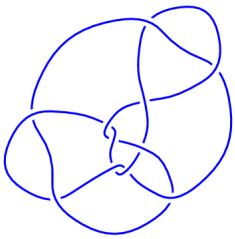
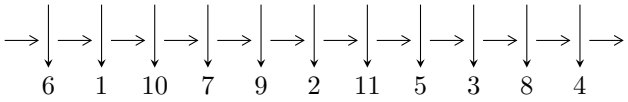
$11a_{227}$ $(K11a_{227})$



1

Arc Sequences



Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{3} I_i^u$$

$$\begin{aligned}
I_1^u &= \langle a^{60} - 2a^{59} + \cdots + 10580a + 1363, \\
&\quad 1.66325 \times 10^{177}u - 4.73130 \times 10^{174}a^{59} + \cdots - 5.65568 \times 10^{178}a - 6.95678 \times 10^{177}, \\
&\quad 8.85580 \times 10^{182}b - 1.27710 \times 10^{181}a^{59} + \cdots - 1.09868 \times 10^{185}a - 1.43109 \times 10^{184} \rangle \\
I_2^u &= \langle u^{19} - 6u^{17} + \cdots - 3u + 1,\ -2u^{18} - u^{17} + \cdots + b + 6,\ -4u^{18} - u^{17} + \cdots + a + 3 \rangle \\
I_3^u &= \langle u^{30} + 11u^{29} + \cdots - 192u - 32,\ 96u^{29} + 927u^{28} + \cdots + 4b - 1052, \\
&\quad - 505u^{29} - 5291u^{28} + \cdots + 32a + 14704 \rangle
\end{aligned}$$

There are 3 irreducible components with 109 representations.

[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. $I_1^u = \langle a^{60} - 2a^{59} + \cdots + 10580a + 1363,\ 1.66 \times 10^{177}u - 4.73 \times 10^{174}a^{59} + \cdots - 5.66 \times 10^{178}a - 6.96 \times 10^{177},\ 8.86 \times 10^{182}b - 1.28 \times 10^{181}a^{59} + \cdots - 1.10 \times 10^{185}a - 1.43 \times 10^{184} \rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ 0.00284461a^{59} - 0.00777313a^{58} + \cdots + 34.0037a + 4.18264 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ 0.00441319a^{59} - 0.0119558a^{58} + \cdots + 55.4725a + 9.56783 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.00441319a^{59} + 0.0119558a^{58} + \cdots - 55.4725a - 8.56783 \\ 0.00441319a^{59} - 0.0119558a^{58} + \cdots + 55.4725a + 9.56783 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.00284461a^{59} + 0.00777313a^{58} + \cdots - 34.0037a - 4.18264 \\ -0.00197622a^{59} + 0.00570742a^{58} + \cdots - 16.1122a - 2.49858 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} a \\ 0.0144210a^{59} - 0.0439342a^{58} + \cdots + 124.063a + 16.1600 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0177218a^{59} - 0.0559898a^{58} + \cdots + 122.455a + 14.9253 \\ -0.0270875a^{59} + 0.0742857a^{58} + \cdots - 302.646a - 47.1868 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.00124238a^{59} - 0.00314649a^{58} + \cdots + 18.1706a + 2.84038 \\ -0.00856735a^{59} + 0.0278153a^{58} + \cdots - 37.1975a - 4.62913 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.0176292a^{59} - 0.0414465a^{58} + \cdots + 279.677a + 44.0567 \\ 0.0257290a^{59} - 0.0720815a^{58} + \cdots + 266.205a + 38.8616 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.00117307a^{59} - 0.00279519a^{58} + \cdots + 17.8605a + 2.72160 \\ 0.0103129a^{59} - 0.0276564a^{58} + \cdots + 126.953a + 18.8599 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.00855263a^{59} + 0.0308947a^{58} + \cdots - 14.9199a + 1.06556 \\ 0.0284945a^{59} - 0.0738824a^{58} + \cdots + 369.518a + 57.1680 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.00855263a^{59} + 0.0308947a^{58} + \cdots - 14.9199a + 1.06556 \\ 0.0284945a^{59} - 0.0738824a^{58} + \cdots + 369.518a + 57.1680 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.002193+0.295542I$ $a=-1.66528-0.57972I$ $b=\ 0.728699+0.994107I$	$-6.49631+2.45488I$	$-19.2016-5.2249I$
$u=-1.002193-0.295542I$ $a=-1.66528+0.57972I$ $b=\ 0.728699-0.994107I$	$-6.49631-2.45488I$	$-19.2016+5.2249I$
$u=-1.002193+0.295542I$ $a=-1.328533-0.473620I$ $b=\ 1.49814-0.13668I$	$-6.49631-0.60627I$	$-19.2016+3.6364I$
$u=-1.002193-0.295542I$ $a=-1.328533+0.473620I$ $b=\ 1.49814+0.13668I$	$-6.49631+0.60627I$	$-19.2016-3.6364I$
$u=\ 1.073950+0.558752I$ $a=-1.291393-0.249319I$ $b=\ 1.40234-1.90223I$	$-4.60570-7.22360I$	$-15.4849+9.9412I$
$u=\ 1.073950-0.558752I$ $a=-1.291393+0.249319I$ $b=\ 1.40234+1.90223I$	$-4.60570+7.22360I$	$-15.4849-9.9412I$
$u=\ 1.073950-0.558752I$ $a=-1.104192-0.163853I$ $b=\ 2.06681+1.10811I$	$0.93776+10.09385I$	$-11.2557-9.0092I$
$u=\ 1.073950+0.558752I$ $a=-1.104192+0.163853I$ $b=\ 2.06681-1.10811I$	$0.93776-10.09385I$	$-11.2557+9.0092I$
$u=-1.002193+0.295542I$ $a=-1.072954-0.122701I$ $b=\ 1.77622+1.03632I$	$-4.42433+0.92430I$	$-18.2356-0.7942I$
$u=-1.002193-0.295542I$ $a=-1.072954+0.122701I$ $b=\ 1.77622-1.03632I$	$-4.42433-0.92430I$	$-18.2356+0.7942I$

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.428243 + 0.664531I$ $a = -0.833695 - 0.218682I$ $b = 1.100314 - 0.063231I$	$-0.643115 + 0.924305I$	$-10.80214 - 0.79423I$
$u = 0.428243 - 0.664531I$ $a = -0.833695 + 0.218682I$ $b = 1.100314 + 0.063231I$	$-0.643115 - 0.924305I$	$-10.80214 + 0.79423I$
$u = 0.428243 - 0.664531I$ $a = -0.77798 - 1.35076I$ $b = -1.062956 + 0.550304I$	$-2.71510 - 2.45488I$	$-11.76817 + 5.22487I$
$u = 0.428243 + 0.664531I$ $a = -0.77798 + 1.35076I$ $b = -1.062956 - 0.550304I$	$-2.71510 + 2.45488I$	$-11.76817 - 5.22487I$
$u = 1.073950 - 0.558752I$ $a = -0.769503 - 0.220797I$ $b = 1.195111 + 0.338051I$	$0.93776 + 1.29219I$	$-11.25569 - 2.01198I$
$u = 1.073950 + 0.558752I$ $a = -0.769503 + 0.220797I$ $b = 1.195111 - 0.338051I$	$0.93776 - 1.29219I$	$-11.25569 + 2.01198I$
$u = 1.073950 - 0.558752I$ $a = -0.757586 - 0.220742I$ $b = 0.81812 + 2.17405I$	$-4.60570 + 4.16244I$	$-15.4849 - 1.0799I$
$u = 1.073950 + 0.558752I$ $a = -0.757586 + 0.220742I$ $b = 0.81812 - 2.17405I$	$-4.60570 - 4.16244I$	$-15.4849 + 1.0799I$
$u = 0.428243 - 0.664531I$ $a = -0.53729 - 1.73675I$ $b = -0.914920 + 1.071209I$	$-2.71510 + 0.60627I$	$-11.76817 - 3.63642I$
$u = 0.428243 + 0.664531I$ $a = -0.53729 + 1.73675I$ $b = -0.914920 - 1.071209I$	$-2.71510 - 0.60627I$	$-11.76817 + 3.63642I$

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.428243 - 0.664531I$ $a = -0.385181 - 1.269695I$ $b = -0.301518 + 0.056449I$	$-0.643115 - 0.924305I$	$-10.80214 + 0.79423I$
$u = \ 0.428243 + 0.664531I$ $a = -0.385181 + 1.269695I$ $b = -0.301518 - 0.056449I$	$-0.643115 + 0.924305I$	$-10.80214 - 0.79423I$
$u = \ 1.073950 + 0.558752I$ $a = -0.333395 - 0.720155I$ $b = \ 0.978762 - 0.695803I$	$-2.53372 - 5.69302I$	$-14.5189 + 5.5106I$
$u = \ 1.073950 - 0.558752I$ $a = -0.333395 + 0.720155I$ $b = \ 0.978762 + 0.695803I$	$-2.53372 + 5.69302I$	$-14.5189 - 5.5106I$
$u = \ 1.073950 - 0.558752I$ $a = -0.224280 - 0.815242I$ $b = -0.522597 + 0.111885I$	$0.93776 + 1.29219I$	$-11.25569 - 2.01198I$
$u = \ 1.073950 + 0.558752I$ $a = -0.224280 + 0.815242I$ $b = -0.522597 - 0.111885I$	$0.93776 - 1.29219I$	$-11.25569 + 2.01198I$
$u = -1.002193 + 0.295542I$ $a = -0.169727 - 0.160910I$ $b = -1.13258 - 1.37389I$	$-0.95285 + 5.32514I$	$-14.9724 - 4.2928I$
$u = -1.002193 - 0.295542I$ $a = -0.169727 + 0.160910I$ $b = -1.13258 + 1.37389I$	$-0.95285 - 5.32514I$	$-14.9724 + 4.2928I$
$u = -1.002193 + 0.295542I$ $a = -0.128070 - 1.215657I$ $b = -1.45609 - 0.39296I$	$-0.95285 - 3.47653I$	$-14.9724 + 2.7044I$
$u = -1.002193 - 0.295542I$ $a = -0.128070 + 1.215657I$ $b = -1.45609 + 0.39296I$	$-0.95285 + 3.47653I$	$-14.9724 - 2.7044I$

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \ 0.428243 + 0.664531I$ $a = -0.125038 - 0.976428I$ $b = -0.044938 - 0.433573I$	$2.82837 - 3.47653I$	$-7.53897 + 2.70436I$
$u = \ 0.428243 - 0.664531I$ $a = -0.125038 + 0.976428I$ $b = -0.044938 + 0.433573I$	$2.82837 + 3.47653I$	$-7.53897 - 2.70436I$
$u = \ 0.428243 + 0.664531I$ $a = -0.00685 - 1.63370I$ $b = \ 1.32030 + 0.88057I$	$-2.71510 + 2.45488I$	$-11.76817 - 5.22487I$
$u = \ 0.428243 - 0.664531I$ $a = -0.00685 + 1.63370I$ $b = \ 1.32030 - 0.88057I$	$-2.71510 - 2.45488I$	$-11.76817 + 5.22487I$
$u = \ 0.428243 + 0.664531I$ $a = \ 0.20773 - 1.57391I$ $b = \ 0.603093 - 0.244032I$	$2.82837 + 5.32514I$	$-7.53897 - 4.29281I$
$u = \ 0.428243 - 0.664531I$ $a = \ 0.20773 + 1.57391I$ $b = \ 0.603093 + 0.244032I$	$2.82837 - 5.32514I$	$-7.53897 + 4.29281I$
$u = -1.002193 - 0.295542I$ $a = \ 0.375175 - 0.724382I$ $b = \ 0.974822 - 0.707780I$	$-4.42433 - 0.92430I$	$-18.2356 + 0.7942I$
$u = -1.002193 + 0.295542I$ $a = \ 0.375175 + 0.724382I$ $b = \ 0.974822 + 0.707780I$	$-4.42433 + 0.92430I$	$-18.2356 - 0.7942I$
$u = \ 1.073950 - 0.558752I$ $a = \ 0.469354 - 1.123765I$ $b = -1.56141 - 0.47622I$	$0.93776 + 10.09385I$	$-11.2557 - 9.0092I$
$u = \ 1.073950 + 0.558752I$ $a = \ 0.469354 + 1.123765I$ $b = -1.56141 + 0.47622I$	$0.93776 - 10.09385I$	$-11.2557 + 9.0092I$

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.428243 + 0.664531I$ $a = 0.701704 - 0.918836I$ $b = 1.064169 + 0.680026I$	$-2.71510 - 0.60627I$	$-11.76817 + 3.63642I$
$u = 0.428243 - 0.664531I$ $a = 0.701704 + 0.918836I$ $b = 1.064169 - 0.680026I$	$-2.71510 + 0.60627I$	$-11.76817 - 3.63642I$
$u = -1.002193 - 0.295542I$ $a = 0.832763 - 0.389054I$ $b = -2.06305 + 1.14396I$	$-0.95285 + 3.47653I$	$-14.9724 - 2.7044I$
$u = -1.002193 + 0.295542I$ $a = 0.832763 + 0.389054I$ $b = -2.06305 - 1.14396I$	$-0.95285 - 3.47653I$	$-14.9724 + 2.7044I$
$u = 1.073950 + 0.558752I$ $a = 1.018952 - 0.320089I$ $b = -1.32134 + 2.24866I$	$-4.60570 - 7.22360I$	$-15.4849 + 9.9412I$
$u = 1.073950 - 0.558752I$ $a = 1.018952 + 0.320089I$ $b = -1.32134 - 2.24866I$	$-4.60570 + 7.22360I$	$-15.4849 - 9.9412I$
$u = 1.073950 + 0.558752I$ $a = 1.032314 - 0.277038I$ $b = -1.48426 + 1.16007I$	$-2.53372 - 5.69302I$	$-14.5189 + 5.5106I$
$u = 1.073950 - 0.558752I$ $a = 1.032314 + 0.277038I$ $b = -1.48426 - 1.16007I$	$-2.53372 + 5.69302I$	$-14.5189 - 5.5106I$
$u = -1.002193 + 0.295542I$ $a = 1.090999 - 0.414524I$ $b = -1.75876 - 1.15328I$	$-0.95285 + 5.32514I$	$-14.9724 - 4.2928I$
$u = -1.002193 - 0.295542I$ $a = 1.090999 + 0.414524I$ $b = -1.75876 + 1.15328I$	$-0.95285 - 5.32514I$	$-14.9724 + 4.2928I$

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.002193-0.295542I$ $a=\ \ 1.215983-0.417739I$ $b=-0.816164-0.692097I$	$-6.49631-2.45488I$	$-19.2016+5.2249I$
$u=-1.002193+0.295542I$ $a=\ \ 1.215983+0.417739I$ $b=-0.816164+0.692097I$	$-6.49631+2.45488I$	$-19.2016-5.2249I$
$u=\ \ 0.428243+0.664531I$ $a=\ \ 1.35599-0.46748I$ $b=-0.864199+0.716778I$	$2.82837-3.47653I$	$-7.53897+2.70436I$
$u=\ \ 0.428243-0.664531I$ $a=\ \ 1.35599+0.46748I$ $b=-0.864199-0.716778I$	$2.82837+3.47653I$	$-7.53897-2.70436I$
$u=\ \ 1.073950+0.558752I$ $a=\ \ 1.385778-0.158908I$ $b=-1.15642+2.06393I$	$-4.60570-4.16244I$	$-15.4849+1.0799I$
$u=\ \ 1.073950-0.558752I$ $a=\ \ 1.385778+0.158908I$ $b=-1.15642-2.06393I$	$-4.60570+4.16244I$	$-15.4849-1.0799I$
$u=\ \ 0.428243-0.664531I$ $a=\ \ 1.40154-0.56875I$ $b=-1.55531-0.23971I$	$2.82837-5.32514I$	$-7.53897+4.29281I$
$u=\ \ 0.428243+0.664531I$ $a=\ \ 1.40154+0.56875I$ $b=-1.55531+0.23971I$	$2.82837+5.32514I$	$-7.53897-4.29281I$
$u=-1.002193-0.295542I$ $a=\ \ 1.42266-0.94185I$ $b=-0.010389+0.661768I$	$-6.49631+0.60627I$	$-19.2016-3.6364I$
$u=-1.002193+0.295542I$ $a=\ \ 1.42266+0.94185I$ $b=-0.010389-0.661768I$	$-6.49631-0.60627I$	$-19.2016+3.6364I$

II.

$\boldsymbol{I_2^u = \langle u^{19}-6u^{17}+\cdots-3u+1,\ -2u^{18}-u^{17}+\cdots+b+6,\ -4u^{18}-u^{17}+\cdots+a+3\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix}1\\0\end{pmatrix}$$

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

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

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

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

$$a_9 = \begin{pmatrix}4u^{18}+u^{17}+\cdots-4u-3\\2u^{18}+u^{17}+\cdots+9u-6\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}4u^{18}-u^{17}+\cdots+19u^2-11u\\u^{18}+2u^{17}+\cdots+7u-5\end{pmatrix}$$

$$a_5 = \begin{pmatrix}-u^{18}+7u^{16}+\cdots+4u+2\\u^{18}+u^{17}+\cdots+6u^2+3u\end{pmatrix}$$

$$a_4 = \begin{pmatrix}-u^{18}+7u^{16}+\cdots+8u+1\\u^{18}-6u^{16}+\cdots-u+1\end{pmatrix}$$

$$a_8 = \begin{pmatrix}3u^{17}-18u^{15}+\cdots+18u-7\\u^{18}-2u^{17}+\cdots-2u-1\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}4u^{18}-3u^{17}+\cdots-16u+2\\-2u^{18}+10u^{16}+\cdots-3u^3-1\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}4u^{18}-3u^{17}+\cdots-16u+2\\-2u^{18}+10u^{16}+\cdots-3u^3-1\end{pmatrix}$$

(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
$u=-1.39483$ $a=-0.875482$ $b=\ \ 0.509910$	-9.09201	-15.7387
$u=-0.967261-0.354798I$ $a=-1.39993+0.78759I$ $b=\ \ 0.780661-0.275556I$	$-5.96459-0.14794I$	$-11.82997+4.86845I$
$u=-0.967261+0.354798I$ $a=-1.39993-0.78759I$ $b=\ \ 0.780661+0.275556I$	$-5.96459+0.14794I$	$-11.82997-4.86845I$
$u=-0.959396-0.782749I$ $a=\ \ 0.231604-0.416341I$ $b=-0.202872+0.192379I$	$2.39322-0.08960I$	$-4.76406-0.93292I$
$u=-0.959396+0.782749I$ $a=\ \ 0.231604+0.416341I$ $b=-0.202872-0.192379I$	$2.39322+0.08960I$	$-4.76406+0.93292I$
$u=-0.859964-0.270094I$ $a=\ \ 1.69450-0.51217I$ $b=-0.841437+0.112926I$	$-5.42770-2.49496I$	$-9.36645+5.70226I$
$u=-0.859964+0.270094I$ $a=\ \ 1.69450+0.51217I$ $b=-0.841437-0.112926I$	$-5.42770+2.49496I$	$-9.36645-5.70226I$
$u=-0.799111-0.756170I$ $a=-0.526472+0.077673I$ $b=\ \ 0.293198+0.063546I$	$2.87601-5.72258I$	$-9.05355+4.91542I$
$u=-0.799111+0.756170I$ $a=-0.526472-0.077673I$ $b=\ \ 0.293198-0.063546I$	$2.87601+5.72258I$	$-9.05355-4.91542I$
$u=\ \ 0.389498$ $a=-1.90918$ $b=-1.21805$	-2.73039	-14.2036

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.524497 - 0.661152I$ $a = -0.540563 - 1.278207I$ $b = -1.12121 + 0.90066I$	$-2.75709 - 1.00041I$	$-12.04366 + 0.13880I$
$u = 0.524497 + 0.661152I$ $a = -0.540563 + 1.278207I$ $b = -1.12121 - 0.90066I$	$-2.75709 + 1.00041I$	$-12.04366 - 0.13880I$
$u = 0.701288 - 0.304921I$ $a = 0.320238 + 1.048927I$ $b = 1.96015 + 0.13479I$	$0.58710 - 3.61548I$	$-7.77111 + 2.87703I$
$u = 0.701288 + 0.304921I$ $a = 0.320238 - 1.048927I$ $b = 1.96015 - 0.13479I$	$0.58710 + 3.61548I$	$-7.77111 - 2.87703I$
$u = 1.041770 - 0.569580I$ $a = 1.156458 + 0.128780I$ $b = -1.07967 - 2.16478I$	$-4.29805 + 5.80588I$	$-12.82283 - 4.90465I$
$u = 1.041770 + 0.569580I$ $a = 1.156458 - 0.128780I$ $b = -1.07967 + 2.16478I$	$-4.29805 - 5.80588I$	$-12.82283 + 4.90465I$
$u = 1.093669 - 0.388336I$ $a = -0.802381 + 0.254993I$ $b = 1.89389 + 1.54793I$	$-0.93178 + 6.58854I$	$-14.8946 - 10.5687I$
$u = 1.093669 + 0.388336I$ $a = -0.802381 - 0.254993I$ $b = 1.89389 - 1.54793I$	$-0.93178 - 6.58854I$	$-14.8946 + 10.5687I$
$u = 1.45435$ $a = 0.517746$ $b = -1.65728$	-7.18999	-56.9652

III. $I_3^u = \langle u^{30} + 11u^{29} + \cdots - 192u - 32,\ 96u^{29} + 927u^{28} + \cdots + 4b - 1052,\ -505u^{29} - 5291u^{28} + \cdots + 32a + 14704\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

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

$$a_9 = \begin{pmatrix} \frac{505}{32}u^{29} + \frac{5291}{32}u^{28} + \cdots - 2535u - \frac{919}{2} \\ -24u^{29} - \frac{927}{4}u^{28} + \cdots + \frac{3549}{2}u + 263 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -19.2188u^{29} - 185.156u^{28} + \cdots + 1739.50u + 285.500 \\ \frac{11}{4}u^{29} + \frac{41}{2}u^{28} + \cdots + \frac{141}{2}u + 23 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{135}{32}u^{29} - \frac{1395}{32}u^{28} + \cdots + 679u + 131 \\ \frac{169}{16}u^{29} + \frac{1645}{16}u^{28} + \cdots - 1145u - 203 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{203}{32}u^{29} - \frac{1863}{32}u^{28} + \cdots + 306u + 41 \\ -\frac{45}{16}u^{29} - \frac{529}{16}u^{28} + \cdots + 840u + 167 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 32.6250u^{29} + 323.813u^{28} + \cdots - 3808.25u - 656.500 \\ -\frac{265}{16}u^{29} - \frac{2397}{16}u^{28} + \cdots + \frac{731}{2}u - 10 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{161}{32}u^{29} + \frac{1303}{32}u^{28} + \cdots + \frac{407}{2}u + 75 \\ \frac{43}{4}u^{29} + \frac{877}{8}u^{28} + \cdots - 1607u - 307 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{161}{32}u^{29} + \frac{1303}{32}u^{28} + \cdots + \frac{407}{2}u + 75 \\ \frac{43}{4}u^{29} + \frac{877}{8}u^{28} + \cdots - 1607u - 307 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.48034$ $a=-0.497565$ $b=\ \ 1.53342$	-7.09333	26.3307
$u=-1.214540-0.631477I$ $a=-1.030580+0.089413I$ $b=\ \ 1.40073-1.59567I$	$-6.38290-11.14708I$	$-15.9321+7.3132I$
$u=-1.214540+0.631477I$ $a=-1.030580-0.089413I$ $b=\ \ 1.40073+1.59567I$	$-6.38290+11.14708I$	$-15.9321-7.3132I$
$u=-1.212148-0.509515I$ $a=\ \ 0.799086+0.151020I$ $b=-1.60822+1.08041I$	$0.34945-6.45290I$	$-8.62006+7.93871I$
$u=-1.212148+0.509515I$ $a=\ \ 0.799086-0.151020I$ $b=-1.60822-1.08041I$	$0.34945+6.45290I$	$-8.62006-7.93871I$
$u=-1.184760-0.635088I$ $a=\ \ 1.172613-0.064361I$ $b=-1.57441+1.79385I$	$-3.2788-17.3495I$	$-13.0734+9.7060I$
$u=-1.184760+0.635088I$ $a=\ \ 1.172613+0.064361I$ $b=-1.57441-1.79385I$	$-3.2788+17.3495I$	$-13.0734-9.7060I$
$u=-0.972756-0.901108I$ $a=\ \ 0.465370-0.495622I$ $b=\ \ 0.099741+0.994979I$	$1.48873-0.08947I$	$-14.6678-0.3502I$
$u=-0.972756+0.901108I$ $a=\ \ 0.465370+0.495622I$ $b=\ \ 0.099741-0.994979I$	$1.48873+0.08947I$	$-14.6678+0.3502I$
$u=-0.958919-0.665702I$ $a=-0.239883-0.652090I$ $b=\ \ 1.193567+0.232892I$	$4.42305-5.51991I$	$-5.37311+3.55740I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.958919+0.665702I$ $a=-0.239883+0.652090I$ $b=\ \ 1.193567-0.232892I$	$4.42305+5.51991I$	$-5.37311-3.55740I$
$u=-0.831465-0.619805I$ $a=\ \ 0.473983+0.414816I$ $b=-0.903549+0.466718I$	$1.77898-2.42113I$	$-7.07335+4.38585I$
$u=-0.831465+0.619805I$ $a=\ \ 0.473983-0.414816I$ $b=-0.903549-0.466718I$	$1.77898+2.42113I$	$-7.07335-4.38585I$
$u=-0.782901-0.947325I$ $a=-0.659120+0.462656I$ $b=\ \ 0.043615-1.017370I$	$2.03512-6.57158I$	$-13.1399+7.7803I$
$u=-0.782901+0.947325I$ $a=-0.659120-0.462656I$ $b=\ \ 0.043615+1.017370I$	$2.03512+6.57158I$	$-13.1399-7.7803I$
$u=-0.665243-0.706437I$ $a=-0.879353-0.325641I$ $b=\ \ 0.774095-0.869253I$	$5.27507+0.27236I$	$-4.38143+1.72345I$
$u=-0.665243+0.706437I$ $a=-0.879353+0.325641I$ $b=\ \ 0.774095+0.869253I$	$5.27507-0.27236I$	$-4.38143-1.72345I$
$u=-0.354016-0.952222I$ $a=\ \ 0.10721+1.42760I$ $b=-1.081618-0.653977I$	$-0.73838+11.58091I$	$-10.77845-6.50285I$
$u=-0.354016+0.952222I$ $a=\ \ 0.10721-1.42760I$ $b=-1.081618+0.653977I$	$-0.73838-11.58091I$	$-10.77845+6.50285I$
$u=-0.296677-1.000257I$ $a=-0.104662-1.215556I$ $b=\ \ 0.868623+0.573748I$	$-3.57253+5.28515I$	$-13.21757-4.63262I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.296677+1.000257I$ $a=-0.104662+1.215556I$ $b=\ \ 0.868623-0.573748I$	$-3.57253-5.28515I$	$-13.21757+4.63262I$
$u=-0.216760-0.735038I$ $a=\ \ 0.568398+1.097873I$ $b=-0.881974+0.009556I$	$3.33461+1.71029I$	$-5.29492-2.96109I$
$u=-0.216760+0.735038I$ $a=\ \ 0.568398-1.097873I$ $b=-0.881974-0.009556I$	$3.33461-1.71029I$	$-5.29492+2.96109I$
$u=\ \ 0.445504$ $a=-0.807468$ $b=\ \ 0.248862$	-0.640430	-15.6034
$u=\ \ 0.926080-0.166520I$ $a=-0.338197-0.579794I$ $b=\ \ 0.189743+0.265937I$	$-0.275678+0.763775I$	$-12.33614-0.51179I$
$u=\ \ 0.926080+0.166520I$ $a=-0.338197+0.579794I$ $b=\ \ 0.189743-0.265937I$	$-0.275678-0.763775I$	$-12.33614+0.51179I$
$u=\ \ 1.338149-0.148812I$ $a=-0.965376-0.388751I$ $b=\ \ 0.564700+0.196986I$	$-6.69442-8.00845I$	$-16.1183+5.5286I$
$u=\ \ 1.338149+0.148812I$ $a=-0.965376+0.388751I$ $b=\ \ 0.564700-0.196986I$	$-6.69442+8.00845I$	$-16.1183-5.5286I$
$u=\ \ 1.44337-0.22944I$ $a=\ \ 0.783028+0.284068I$ $b=-0.476181-0.138994I$	$-9.50227-0.94273I$	$-17.3571+6.1588I$
$u=\ \ 1.44337+0.22944I$ $a=\ \ 0.783028-0.284068I$ $b=-0.476181+0.138994I$	$-9.50227+0.94273I$	$-17.3571-6.1588I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(1-u+2u^3-u^4-u^5+u^6)^{10}(u^{19}-6u^{17}+\cdots-3u+1)$ $(u^{30}+11u^{29}+\cdots-192u-32)$
c_2	$(1+u+2u^2+4u^3+5u^4+3u^5+u^6)^{10}(u^{19}+12u^{18}+\cdots+15u+1)$ $(u^{30}+15u^{29}+\cdots+6656u+1024)$
c_3	$(u^{19}-u^{18}+\cdots-7u^2+1)(u^{30}+u^{29}+\cdots-4u-1)$ $(u^{60}+u^{59}+\cdots-5088u+1363)$
c_4	$(u^{19}-u^{18}+\cdots-5u-1)(u^{30}+u^{29}+\cdots-5u-1)$ $(u^{60}+5u^{59}+\cdots-122u+29)$
c_5	$(u^{19}+u^{18}+\cdots+7u^2-1)(u^{30}+u^{29}+\cdots-4u-1)$ $(u^{60}+u^{59}+\cdots-5088u+1363)$
c_6	$(1-u+2u^3-u^4-u^5+u^6)^{10}(u^{19}-6u^{17}+\cdots-3u-1)$ $(u^{30}+11u^{29}+\cdots-192u-32)$
c_7	$(u^{19}-4u^{18}+\cdots-2u+1)(u^{30}+15u^{29}+\cdots+608u+64)$ $(u^{60}-12u^{59}+\cdots-12u+1)$
c_8	$(u+1)(u^{19}-u^{18}+\cdots-7u^2+1)(u^{30}+u^{29}+\cdots-4u-1)$ $(u^{59}-22u^{57}+\cdots-6451u+1363)$
c_9	$(u^{19}+u^{18}+\cdots+7u^2-1)(u^{30}+u^{29}+\cdots-4u-1)$ $(u^{60}+u^{59}+\cdots-5088u+1363)$
c_{10}	$(u^{19}+4u^{18}+\cdots-2u-1)(u^{30}+15u^{29}+\cdots+608u+64)$ $(u^{60}-12u^{59}+\cdots-12u+1)$
c_{11}	$(u^{19}-u^{18}+\cdots-5u-1)(u^{30}+u^{29}+\cdots-5u-1)$ $(u^{60}+5u^{59}+\cdots-122u+29)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_6	$(1-y+2y^2-4y^3+5y^4-3y^5+y^6)^{10}(y^{19}-12y^{18}+\cdots+15y-1)$ $(y^{30}-15y^{29}+\cdots-6656y+1024)$
c_2	$(1+3y+6y^2+5y^4+y^5+y^6)^{10}(y^{19}-16y^{17}+\cdots+39y-1)$ $(y^{30}+y^{29}+\cdots-26607616y+1048576)$
c_3	$(y^{19}-19y^{18}+\cdots+14y-1)(y^{30}-19y^{29}+\cdots-10y+1)$ $(y^{60}-45y^{59}+\cdots-62677840y+1857769)$
c_4	$(y^{19}-y^{18}+\cdots+19y-1)(y^{30}+15y^{29}+\cdots-63y+1)$ $(y^{60}-9y^{59}+\cdots+41260y+841)$
c_5	$(y^{19}-19y^{18}+\cdots+14y-1)(y^{30}-19y^{29}+\cdots-10y+1)$ $(y^{60}-45y^{59}+\cdots-62677840y+1857769)$
c_7	$(y^{19}+8y^{18}+\cdots-14y-1)(y^{30}+11y^{29}+\cdots-54272y+4096)$ $(y^{60}+36y^{59}+\cdots+12y+1)$
c_8	$(y^{19}-19y^{18}+\cdots+14y-1)(y^{30}-19y^{29}+\cdots-10y+1)$ $(y^{60}-45y^{59}+\cdots-62677840y+1857769)$
c_9	$(y^{19}-19y^{18}+\cdots+14y-1)(y^{30}-19y^{29}+\cdots-10y+1)$ $(y^{60}-45y^{59}+\cdots-62677840y+1857769)$
c_{10}	$(y^{19}+8y^{18}+\cdots-14y-1)(y^{30}+11y^{29}+\cdots-54272y+4096)$ $(y^{60}+36y^{59}+\cdots+12y+1)$
c_{11}	$(y^{19}-y^{18}+\cdots+19y-1)(y^{30}+15y^{29}+\cdots-63y+1)$ $(y^{60}-9y^{59}+\cdots+41260y+841)$