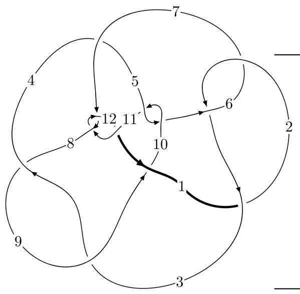
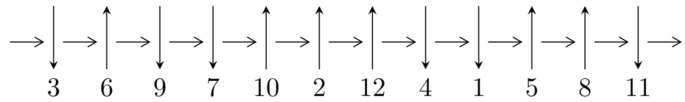
$12a_{0348}$ $(K12a_{0348})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u = \langle & 2.44733 \times 10^{21} u^{19} - 1.13296 \times 10^{22} u^{18} + \cdots + 5.42213 \times 10^{21} b - 2.42529 \times 10^{22}, \\
& - 1.95629 \times 10^{21} u^{19} + 5.54886 \times 10^{22} u^{18} + \cdots + 2.41285 \times 10^{23} a + 6.92349 \times 10^{23}, \\
& 9u^{20} - 45u^{19} + \cdots - 430u + 89 \rangle \\
I_2^u = \langle & -2.31722 \times 10^{21} u^{33} - 5.93285 \times 10^{21} u^{32} + \cdots - 2.13415 \times 10^{21} a + 2.34088 \times 10^{21}, \\
& 8.20059 \times 10^{21} a u^{33} + 9.19800 \times 10^{21} u^{33} + \cdots - 7.14710 \times 10^{21} a - 3.57339 \times 10^{22},\ 3u^{34} + 6u^{33} + \cdots + u^2 + \\
I_3^u = \langle & b,\ a - 1,\ u^4 - u^3 + 2u^2 - 2u + 1 \rangle \\
I_4^u = \langle & -u^3 + b - u + 1,\ -u^3 + u^2 + a - 2u,\ u^4 - u^3 + 2u^2 - 2u + 1 \rangle \\
I_5^u = \langle & b,\ a - 1,\ u^2 + u + 1 \rangle \\
I_6^u = \langle & b - u,\ a,\ u^2 + u + 1 \rangle \\
I_7^u = \langle & -au + b + a + u - 1,\ 2a^2 - au - 3a + 2u + 1,\ u^2 + 1 \rangle \\
I_8^u = \langle & b^2 + b + 1,\ -u^5 a^2 + 2u^5 a + \cdots - 2b - 1,\ -u^3 a + u^3 + bu - au + b + u, \\
& u^6 a^2 - 2u^6 a + 2u^4 a^2 + u^6 - 3u^4 a + a^2 u^2 + u^3 a + u^4 - u^2 a - u^3 + au + u^2 + u + 1 \rangle \\
I_9^u = \langle & -u^5 a^2 + 2u^5 a - 2u^3 a^2 - u^5 + 3u^3 a - a^2 u + u^2 a - u^3 + au - u^2 + b + a - u, \\
& u^6 a^2 - 2u^6 a + 2u^4 a^2 + u^6 - 3u^4 a + a^2 u^2 - 2u^3 a + u^4 - u^2 a + 2u^3 - 2au + u^2 + u + 1 \rangle
\end{aligned}
$$

* 7 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 104 representations.
* 2 irreducible components of $\dim_{\mathbb{C}} = 1$

---

[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`).

I. $\boldsymbol{I_1^u = \langle 2.45\times10^{21}u^{19} - 1.13\times10^{22}u^{18} + \cdots + 5.42\times10^{21}b - 2.43\times10^{22},\ -1.96\times10^{21}u^{19} + 5.55\times10^{22}u^{18} + \cdots + 2.41\times10^{23}a + 6.92\times10^{23},\ 9u^{20} - 45u^{19} + \cdots - 430u + 89\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.00810779u^{19} - 0.229972u^{18} + \cdots + 10.0312u - 2.86943 \\ -0.451360u^{19} + 2.08951u^{18} + \cdots - 19.3998u + 4.47296 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.443253u^{19} + 1.85954u^{18} + \cdots - 9.36858u + 1.60353 \\ -0.451360u^{19} + 2.08951u^{18} + \cdots - 19.3998u + 4.47296 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.211003u^{19} + 0.993904u^{18} + \cdots - 3.69980u + 1.00079 \\ 0.0403786u^{19} - 0.205972u^{18} + \cdots + 0.306071u - 0.245024 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.0858884u^{19} - 0.602361u^{18} + \cdots + 12.6293u - 2.96434 \\ -0.149037u^{19} + 0.448835u^{18} + \cdots - 0.0305593u - 0.376609 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.225218u^{19} - 1.17037u^{18} + \cdots + 15.3833u - 4.17263 \\ -0.277055u^{19} + 0.981406u^{18} + \cdots + 0.712270u - 0.967405 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.142110u^{19} - 0.738313u^{18} + \cdots + 10.1501u - 1.73455 \\ -0.0701601u^{19} + 0.526991u^{18} + \cdots - 9.31954u + 2.50170 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.262889u^{19} - 1.03833u^{18} + \cdots + 8.32215u - 2.29128 \\ -0.0555259u^{19} + 0.0487443u^{18} + \cdots + 8.11030u - 2.81062 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 0.0853475u^{19} - 0.306104u^{18} + \cdots + 3.79747u - 0.473020 \\ 0.251374u^{19} - 1.26858u^{18} + \cdots + 13.5561u - 3.51608 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{18263454827549106375}{16944149536425861532 4}u^{19} - \frac{59899476849528023793}{42360373841064653831}u^{18} + \cdots + \frac{141114427005478277957347}{169441495364258615324}u - \frac{43694805904307408393 87}{169441495364258615324}$

[2] All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{12}	$u^{20} + 12u^{19} + \cdots + 27u + 4$
c_2, c_6, c_7 c_{11}	$u^{20} + 2u^{19} + \cdots + u + 2$
c_3, c_8	$9(9u^{20} + 45u^{19} + \cdots + 430u + 89)$
c_4, c_9	$4(4u^{20} - 8u^{19} + \cdots + 33u^2 + 9)$
c_5, c_{10}	$9(9u^{20} + 45u^{19} + \cdots + 268u + 89)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{12}	$y^{20} - 8y^{19} + \cdots + 655y + 16$
c_2, c_6, c_7 c_{11}	$y^{20} + 12y^{19} + \cdots + 27y + 4$
c_3, c_8	$81(81y^{20} + 1161y^{19} + \cdots + 40982y + 7921)$
c_4, c_9	$16(16y^{20} + 80y^{19} + \cdots + 594y + 81)$
c_5, c_{10}	$81(81y^{20} + 837y^{19} + \cdots + 66838y + 7921)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.092200 + 1.047180I$ $a = 0.004677 + 0.790560I$ $b = -0.09546 - 1.64917I$	$-8.80426 - 0.45536I$	$1.9853 + 17.0975I$
$u = 0.092200 - 1.047180I$ $a = 0.004677 - 0.790560I$ $b = -0.09546 + 1.64917I$	$-8.80426 + 0.45536I$	$1.9853 - 17.0975I$
$u = 0.848738 + 0.341219I$ $a = -0.396390 + 0.042942I$ $b = 0.693866 + 0.427483I$	$0.08901 - 2.93076I$	$1.95121 + 2.50627I$
$u = 0.848738 - 0.341219I$ $a = -0.396390 - 0.042942I$ $b = 0.693866 - 0.427483I$	$0.08901 + 2.93076I$	$1.95121 - 2.50627I$
$u = 0.613570 + 0.532135I$ $a = -1.169550 - 0.185382I$ $b = 0.168318 - 1.217040I$	$-9.43070 - 2.05540I$	$-10.55085 + 3.27009I$
$u = 0.613570 - 0.532135I$ $a = -1.169550 + 0.185382I$ $b = 0.168318 + 1.217040I$	$-9.43070 + 2.05540I$	$-10.55085 - 3.27009I$
$u = -0.479857 + 0.602074I$ $a = 0.353859 - 1.186080I$ $b = 0.026282 - 0.889205I$	$-2.87875 + 1.45206I$	$-8.03079 - 4.11530I$
$u = -0.479857 - 0.602074I$ $a = 0.353859 + 1.186080I$ $b = 0.026282 + 0.889205I$	$-2.87875 - 1.45206I$	$-8.03079 + 4.11530I$
$u = 1.256360 + 0.179722I$ $a = -0.906871 - 0.475961I$ $b = 0.603304 - 1.077240I$	$-3.61567 - 12.98850I$	$-3.22409 + 10.41992I$
$u = 1.256360 - 0.179722I$ $a = -0.906871 + 0.475961I$ $b = 0.603304 + 1.077240I$	$-3.61567 + 12.98850I$	$-3.22409 - 10.41992I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.202083 + 0.692929I$ $a = 0.668174 + 0.227261I$ $b = -0.254612 + 0.364368I$	$0.359490 - 1.106510I$	$4.17160 + 6.47143I$
$u = 0.202083 - 0.692929I$ $a = 0.668174 - 0.227261I$ $b = -0.254612 - 0.364368I$	$0.359490 + 1.106510I$	$4.17160 - 6.47143I$
$u = 0.37431 + 1.41465I$ $a = 1.021310 + 0.740873I$ $b = -0.944071 - 0.466625I$	$5.54214 - 7.36961I$	$4.38642 + 3.37286I$
$u = 0.37431 - 1.41465I$ $a = 1.021310 - 0.740873I$ $b = -0.944071 + 0.466625I$	$5.54214 + 7.36961I$	$4.38642 - 3.37286I$
$u = -0.33594 + 1.49255I$ $a = -1.032280 + 0.658846I$ $b = 0.816010 - 0.603612I$	$8.32420 + 1.49101I$	$7.14130 + 1.02494I$
$u = -0.33594 - 1.49255I$ $a = -1.032280 - 0.658846I$ $b = 0.816010 + 0.603612I$	$8.32420 - 1.49101I$	$7.14130 - 1.02494I$
$u = 0.54073 + 1.45381I$ $a = 1.82309 + 0.12465I$ $b = -0.682856 + 1.134390I$	$1.4774 - 19.2240I$	$-0.44918 + 10.82584I$
$u = 0.54073 - 1.45381I$ $a = 1.82309 - 0.12465I$ $b = -0.682856 - 1.134390I$	$1.4774 + 19.2240I$	$-0.44918 - 10.82584I$
$u = -0.61219 + 1.52578I$ $a = -1.62445 + 0.10961I$ $b = 0.669219 + 1.040740I$	$5.64729 + 12.61550I$	$2.61904 - 9.47385I$
$u = -0.61219 - 1.52578I$ $a = -1.62445 - 0.10961I$ $b = 0.669219 - 1.040740I$	$5.64729 - 12.61550I$	$2.61904 + 9.47385I$

II. $I_2^u = \langle -2.32 \times 10^{21} u^{33} - 5.93 \times 10^{21} u^{32} + \cdots - 2.13 \times 10^{21} a + 2.34 \times 10^{21},\ 8.20 \times 10^{21} a u^{33} + 9.20 \times 10^{21} u^{33} + \cdots - 7.15 \times 10^{21} a - 3.57 \times 10^{22},\ 3u^{34} + 6u^{33} + \cdots + u^2 + 1 \rangle$

(i) Arc colorings

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

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a \\ 1.08578u^{33} + 2.77996u^{32} + \cdots + a - 1.09687 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1.08578u^{33} + 2.77996u^{32} + \cdots + 2a - 1.09687 \\ 1.08578u^{33} + 2.77996u^{32} + \cdots + a - 1.09687 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1.97436au^{33} - 16.8142u^{33} + \cdots - 3.43039a + 13.1329 \\ 0.681005au^{33} - 1.25817u^{33} + \cdots - 0.357162a + 0.186404 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.589433au^{33} - 1.32608u^{33} + \cdots + 0.705146a + 13.5864 \\ 0.514636au^{33} - 1.30333u^{33} + \cdots - 0.245900a + 4.59327 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -7.17034au^{33} + 27.2048u^{33} + \cdots + 5.86324a - 7.07975 \\ -2.39818au^{33} + 3.29061u^{33} + \cdots + 0.291662a + 2.38603 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 12.4359u^{33} + 3au^{32} + \cdots + a - 33.6250 \\ -0.874985au^{33} + 5.42874u^{33} + \cdots + 1.39011a - 9.26373 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -3au^{33} + 1.73278u^{33} + \cdots + 42.6932u + 6.26647 \\ -0.608399u^{33} - 1.49941u^{32} + \cdots + 1.09687u + 0.361927 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1.04587au^{33} - 17.2962u^{33} + \cdots - 3.60194a + 13.7910 \\ 0.263401au^{33} - 1.07806u^{33} + \cdots - 0.456131a + 0.659305 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{110192114528878828278}{33346026295216206221}u^{33} - \frac{312161458732301950125}{133384105180864824884}u^{32} + \cdots - \frac{118687147920568685837}{66692052590432412442}u - \frac{611488195859711746311}{133384105180864824884}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{12}	$u^{68} + 28u^{67} + \cdots + 3540540u + 405769$
c_2, c_6, c_7 c_{11}	$u^{68} + 4u^{67} + \cdots + 2840u + 637$
c_3, c_8	$9(3u^{34} - 6u^{33} + \cdots + u^2 + 1)^2$
c_4, c_9	$64(64u^{68} + 64u^{67} + \cdots + 770022u + 2211093)$
c_5, c_{10}	$9(3u^{34} - 6u^{33} + \cdots - 4u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{12}	$y^{68} + 28y^{67} + \cdots + 3856761155056y + 164648481361$
c_2, c_6, c_7 c_{11}	$y^{68} + 28y^{67} + \cdots + 3540540y + 405769$
c_3, c_8	$81(9y^{34} + 240y^{33} + \cdots + 2y + 1)^2$
c_4, c_9	4096 $\cdot (4096y^{68} + 106496y^{67} + \cdots + 7083972171144y + 4888932254649)$
c_5, c_{10}	$81(9y^{34} + 168y^{33} + \cdots + 2y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.928923 + 0.129584I$ $a = -0.887196 - 0.818849I$ $b = 0.120625 - 1.127660I$	$-6.72431 + 5.79611I$	$-7.79847 - 4.21340I$
$u = 0.928923 + 0.129584I$ $a = -0.487954 + 0.335298I$ $b = 0.579811 + 1.099130I$	$-6.72431 + 5.79611I$	$-7.79847 - 4.21340I$
$u = 0.928923 - 0.129584I$ $a = -0.887196 + 0.818849I$ $b = 0.120625 + 1.127660I$	$-6.72431 - 5.79611I$	$-7.79847 + 4.21340I$
$u = 0.928923 - 0.129584I$ $a = -0.487954 - 0.335298I$ $b = 0.579811 - 1.099130I$	$-6.72431 - 5.79611I$	$-7.79847 + 4.21340I$
$u = -1.059230 + 0.243669I$ $a = -0.847568 + 0.653323I$ $b = 0.592845 + 1.069630I$	$-1.74401 + 7.89373I$	$-0.77647 - 6.38566I$
$u = -1.059230 + 0.243669I$ $a = -0.610778 - 0.013981I$ $b = 0.736784 - 0.428981I$	$-1.74401 + 7.89373I$	$-0.77647 - 6.38566I$
$u = -1.059230 - 0.243669I$ $a = -0.847568 - 0.653323I$ $b = 0.592845 - 1.069630I$	$-1.74401 - 7.89373I$	$-0.77647 + 6.38566I$
$u = -1.059230 - 0.243669I$ $a = -0.610778 + 0.013981I$ $b = 0.736784 + 0.428981I$	$-1.74401 - 7.89373I$	$-0.77647 + 6.38566I$
$u = 0.196215 + 1.099790I$ $a = 0.344789 + 0.498969I$ $b = -0.236178 + 1.094890I$	$1.71677 - 1.07665I$	$3.45366 + 0.91009I$
$u = 0.196215 + 1.099790I$ $a = -1.19817 - 1.18268I$ $b = 0.753486 + 0.716576I$	$1.71677 - 1.07665I$	$3.45366 + 0.91009I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.196215 - 1.099790I$ $a = 0.344789 - 0.498969I$ $b = -0.236178 - 1.094890I$	$1.71677 + 1.07665I$	$3.45366 - 0.91009I$
$u = 0.196215 - 1.099790I$ $a = -1.19817 + 1.18268I$ $b = 0.753486 - 0.716576I$	$1.71677 + 1.07665I$	$3.45366 - 0.91009I$
$u = -0.411561 + 1.108320I$ $a = 0.173904 - 0.612229I$ $b = -0.143739 - 1.063970I$	$0.82810 + 6.47536I$	$0.07862 - 6.80334I$
$u = -0.411561 + 1.108320I$ $a = -2.12606 + 0.12473I$ $b = 0.664230 + 0.990769I$	$0.82810 + 6.47536I$	$0.07862 - 6.80334I$
$u = -0.411561 - 1.108320I$ $a = 0.173904 + 0.612229I$ $b = -0.143739 + 1.063970I$	$0.82810 - 6.47536I$	$0.07862 + 6.80334I$
$u = -0.411561 - 1.108320I$ $a = -2.12606 - 0.12473I$ $b = 0.664230 - 0.990769I$	$0.82810 - 6.47536I$	$0.07862 + 6.80334I$
$u = 0.061990 + 1.217400I$ $a = 1.271910 - 0.079555I$ $b = -0.594585 + 1.258760I$	$2.60150 - 1.59411I$	$4.61171 + 4.12369I$
$u = 0.061990 + 1.217400I$ $a = -1.55260 - 0.58417I$ $b = 0.832284 + 1.073760I$	$2.60150 - 1.59411I$	$4.61171 + 4.12369I$
$u = 0.061990 - 1.217400I$ $a = 1.271910 + 0.079555I$ $b = -0.594585 - 1.258760I$	$2.60150 + 1.59411I$	$4.61171 - 4.12369I$
$u = 0.061990 - 1.217400I$ $a = -1.55260 + 0.58417I$ $b = 0.832284 - 1.073760I$	$2.60150 + 1.59411I$	$4.61171 - 4.12369I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.309763 + 1.205810I$ $a = 1.19397 - 0.75885I$ $b = -1.018550 + 0.481300I$	$-1.13644 + 4.47248I$	$-0.55538 - 5.09131I$
$u = -0.309763 + 1.205810I$ $a = -0.267392 - 0.127975I$ $b = -0.024069 + 1.347120I$	$-1.13644 + 4.47248I$	$-0.55538 - 5.09131I$
$u = -0.309763 - 1.205810I$ $a = 1.19397 + 0.75885I$ $b = -1.018550 - 0.481300I$	$-1.13644 - 4.47248I$	$-0.55538 + 5.09131I$
$u = -0.309763 - 1.205810I$ $a = -0.267392 + 0.127975I$ $b = -0.024069 - 1.347120I$	$-1.13644 - 4.47248I$	$-0.55538 + 5.09131I$
$u = 0.119470 + 1.302700I$ $a = 0.899516 - 0.373320I$ $b = -0.849347 + 0.300420I$	$5.51314 - 3.80458I$	$6.50154 + 2.43385I$
$u = 0.119470 + 1.302700I$ $a = -1.75555 + 0.34611I$ $b = 0.739450 - 1.017200I$	$5.51314 - 3.80458I$	$6.50154 + 2.43385I$
$u = 0.119470 - 1.302700I$ $a = 0.899516 + 0.373320I$ $b = -0.849347 - 0.300420I$	$5.51314 + 3.80458I$	$6.50154 - 2.43385I$
$u = 0.119470 - 1.302700I$ $a = -1.75555 - 0.34611I$ $b = 0.739450 + 1.017200I$	$5.51314 + 3.80458I$	$6.50154 - 2.43385I$
$u = -0.191943 + 1.294500I$ $a = -1.40999 - 0.47598I$ $b = 0.980900 + 0.597909I$	$4.02612 + 8.09590I$	$3.41300 - 8.32326I$
$u = -0.191943 + 1.294500I$ $a = 1.55696 + 0.03633I$ $b = -0.660088 - 1.203800I$	$4.02612 + 8.09590I$	$3.41300 - 8.32326I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.191943 - 1.294500I$ $a = -1.40999 + 0.47598I$ $b = 0.980900 - 0.597909I$	$4.02612 - 8.09590I$	$3.41300 + 8.32326I$
$u = -0.191943 - 1.294500I$ $a = 1.55696 - 0.03633I$ $b = -0.660088 + 1.203800I$	$4.02612 - 8.09590I$	$3.41300 + 8.32326I$
$u = -0.678482 + 0.094917I$ $a = -0.801065 + 0.534099I$ $b = 0.747677 + 0.320842I$	$-4.52580 - 0.82511I$	$-5.73325 - 0.12383I$
$u = -0.678482 + 0.094917I$ $a = -1.24497 + 1.03985I$ $b = 0.168560 + 1.112030I$	$-4.52580 - 0.82511I$	$-5.73325 - 0.12383I$
$u = -0.678482 - 0.094917I$ $a = -0.801065 - 0.534099I$ $b = 0.747677 - 0.320842I$	$-4.52580 + 0.82511I$	$-5.73325 + 0.12383I$
$u = -0.678482 - 0.094917I$ $a = -1.24497 - 1.03985I$ $b = 0.168560 - 1.112030I$	$-4.52580 + 0.82511I$	$-5.73325 + 0.12383I$
$u = 0.364940 + 0.575344I$ $a = 0.926102 - 0.464353I$ $b = 0.488575 + 0.554913I$	$0.78238 - 1.45136I$	$2.79629 + 5.22795I$
$u = 0.364940 + 0.575344I$ $a = -0.0415032 + 0.1092230I$ $b = -0.528462 + 0.608685I$	$0.78238 - 1.45136I$	$2.79629 + 5.22795I$
$u = 0.364940 - 0.575344I$ $a = 0.926102 + 0.464353I$ $b = 0.488575 - 0.554913I$	$0.78238 + 1.45136I$	$2.79629 - 5.22795I$
$u = 0.364940 - 0.575344I$ $a = -0.0415032 - 0.1092230I$ $b = -0.528462 - 0.608685I$	$0.78238 + 1.45136I$	$2.79629 - 5.22795I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.446114 + 1.243030I$ $a = -0.368802 + 0.014090I$ $b = 0.003968 - 1.305630I$	$-3.22322 - 10.68950I$	$-3.43174 + 7.82810I$
$u = 0.446114 + 1.243030I$ $a = 1.83566 - 0.03089I$ $b = -0.709112 + 1.154840I$	$-3.22322 - 10.68950I$	$-3.43174 + 7.82810I$
$u = 0.446114 - 1.243030I$ $a = -0.368802 - 0.014090I$ $b = 0.003968 + 1.305630I$	$-3.22322 + 10.68950I$	$-3.43174 - 7.82810I$
$u = 0.446114 - 1.243030I$ $a = 1.83566 + 0.03089I$ $b = -0.709112 - 1.154840I$	$-3.22322 + 10.68950I$	$-3.43174 - 7.82810I$
$u = 0.030836 + 1.337180I$ $a = 1.022660 + 0.469683I$ $b = -0.932328 - 0.336335I$	$6.63609 - 2.25268I$	$7.17939 + 3.46008I$
$u = 0.030836 + 1.337180I$ $a = -1.34321 + 0.62136I$ $b = 0.917345 - 0.650827I$	$6.63609 - 2.25268I$	$7.17939 + 3.46008I$
$u = 0.030836 - 1.337180I$ $a = 1.022660 - 0.469683I$ $b = -0.932328 + 0.336335I$	$6.63609 + 2.25268I$	$7.17939 - 3.46008I$
$u = 0.030836 - 1.337180I$ $a = -1.34321 - 0.62136I$ $b = 0.917345 + 0.650827I$	$6.63609 + 2.25268I$	$7.17939 - 3.46008I$
$u = -0.237485 + 0.550986I$ $a = 0.95003 + 1.63364I$ $b = -0.558906 + 0.935813I$	$-0.10373 - 2.96497I$	$-1.46555 - 1.43016I$
$u = -0.237485 + 0.550986I$ $a = 2.75289 + 0.07158I$ $b = 0.389516 - 0.711934I$	$-0.10373 - 2.96497I$	$-1.46555 - 1.43016I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.237485 - 0.550986I$ $a = 0.95003 - 1.63364I$ $b = -0.558906 - 0.935813I$	$-0.10373 + 2.96497I$	$-1.46555 + 1.43016I$
$u = -0.237485 - 0.550986I$ $a = 2.75289 - 0.07158I$ $b = 0.389516 + 0.711934I$	$-0.10373 + 2.96497I$	$-1.46555 + 1.43016I$
$u = -0.461359 + 0.273852I$ $a = -0.696005 + 0.649290I$ $b = -0.663647 - 0.671451I$	$-0.67894 + 5.72667I$	$-2.62369 - 8.41817I$
$u = -0.461359 + 0.273852I$ $a = -0.01371 + 2.29902I$ $b = 0.529575 + 1.033290I$	$-0.67894 + 5.72667I$	$-2.62369 - 8.41817I$
$u = -0.461359 - 0.273852I$ $a = -0.696005 - 0.649290I$ $b = -0.663647 + 0.671451I$	$-0.67894 - 5.72667I$	$-2.62369 + 8.41817I$
$u = -0.461359 - 0.273852I$ $a = -0.01371 - 2.29902I$ $b = 0.529575 - 1.033290I$	$-0.67894 - 5.72667I$	$-2.62369 + 8.41817I$
$u = -0.46554 + 1.43082I$ $a = 0.994812 - 0.782444I$ $b = -0.933512 + 0.483430I$	$3.47191 + 13.30640I$	$0. - 7.02472I$
$u = -0.46554 + 1.43082I$ $a = 1.78917 - 0.09812I$ $b = -0.681591 - 1.143150I$	$3.47191 + 13.30640I$	$0. - 7.02472I$
$u = -0.46554 - 1.43082I$ $a = 0.994812 + 0.782444I$ $b = -0.933512 - 0.483430I$	$3.47191 - 13.30640I$	$0. + 7.02472I$
$u = -0.46554 - 1.43082I$ $a = 1.78917 + 0.09812I$ $b = -0.681591 + 1.143150I$	$3.47191 - 13.30640I$	$0. + 7.02472I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.47159 + 1.50485I$ $a = -0.959034 - 0.635623I$ $b = 0.801025 + 0.589395I$	$7.00842 - 7.08959I$	0
$u = 0.47159 + 1.50485I$ $a = -1.66282 - 0.03292I$ $b = 0.679056 - 1.037650I$	$7.00842 - 7.08959I$	0
$u = 0.47159 - 1.50485I$ $a = -0.959034 + 0.635623I$ $b = 0.801025 - 0.589395I$	$7.00842 + 7.08959I$	0
$u = 0.47159 - 1.50485I$ $a = -1.66282 + 0.03292I$ $b = 0.679056 + 1.037650I$	$7.00842 + 7.08959I$	0
$u = 0.195287 + 0.174782I$ $a = 1.98483 - 4.05832I$ $b = -0.653211 - 0.893273I$	$-1.28851 - 0.65000I$	$-6.53552 + 1.99005I$
$u = 0.195287 + 0.174782I$ $a = 3.07716 - 4.26636I$ $b = 0.461611 - 1.028320I$	$-1.28851 - 0.65000I$	$-6.53552 + 1.99005I$
$u = 0.195287 - 0.174782I$ $a = 1.98483 + 4.05832I$ $b = -0.653211 + 0.893273I$	$-1.28851 + 0.65000I$	$-6.53552 - 1.99005I$
$u = 0.195287 - 0.174782I$ $a = 3.07716 + 4.26636I$ $b = 0.461611 + 1.028320I$	$-1.28851 + 0.65000I$	$-6.53552 - 1.99005I$

III. $I_3^u = \langle b,\ a-1,\ u^4 - u^3 + 2u^2 - 2u + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.621744 + 0.440597I$ $a = 1.00000$ $b = 0$	$-2.02988I$	$0. + 3.46410I$
$u = 0.621744 - 0.440597I$ $a = 1.00000$ $b = 0$	$2.02988I$	$0. - 3.46410I$
$u = -0.121744 + 1.306620I$ $a = 1.00000$ $b = 0$	$2.02988I$	$0. - 3.46410I$
$u = -0.121744 - 1.306620I$ $a = 1.00000$ $b = 0$	$-2.02988I$	$0. + 3.46410I$

IV. $\boldsymbol{I_4^u = \langle -u^3 + b - u + 1,\ -u^3 + u^2 + a - 2u,\ u^4 - u^3 + 2u^2 - 2u + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.621744 + 0.440597I$ $a = \quad 0.929304 + 0.758745I$ $b = -0.500000 + 0.866025I$	$-2.02988I$	$0. + 3.46410I$
$u = \quad 0.621744 - 0.440597I$ $a = \quad 0.929304 - 0.758745I$ $b = -0.500000 - 0.866025I$	$2.02988I$	$0. - 3.46410I$
$u = -0.121744 + 1.306620I$ $a = \quad 2.07070 + 0.75874I$ $b = -0.500000 - 0.866025I$	$2.02988I$	$0. - 3.46410I$
$u = -0.121744 - 1.306620I$ $a = \quad 2.07070 - 0.75874I$ $b = -0.500000 + 0.866025I$	$-2.02988I$	$0. + 3.46410I$

V. $I_5^u = \langle b,\ a-1,\ u^2+u+1\rangle$

(i) Arc colorings

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

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

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

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

$$a_{10} = \begin{pmatrix} u+2 \\ -u-1 \end{pmatrix}$$

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

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u+2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = \quad 1.00000$ $b = \quad 0$	$-2.02988I$	$0. + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = \quad 1.00000$ $b = \quad 0$	$2.02988I$	$0. - 3.46410I$

VI. $I_6^u = \langle b - u,\ a,\ u^2 + u + 1 \rangle$

(i) Arc colorings

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

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

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

$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

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

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

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

$$a_{10} = \begin{pmatrix} -u \\ -u-2 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} u \\ u+1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u + 2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = 0$ $b = -0.500000 + 0.866025I$	$-2.02988I$	$0. + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = 0$ $b = -0.500000 - 0.866025I$	$2.02988I$	$0. - 3.46410I$

VII. $I^u_7 = \langle -au + b + a + u - 1,\ 2a^2 - au - 3a + 2u + 1,\ u^2 + 1\rangle$

(i) Arc colorings

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

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

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

$$a_{11} = \begin{pmatrix} a \\ au - a - u + 1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} au - u + 1 \\ au - a - u + 1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 2au - a - \frac{5}{2}u + \frac{3}{2} \\ -au + a + 2u - 1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} au - \frac{1}{2}u + \frac{1}{2} \\ au + a - u - 2 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} \frac{1}{2}au + \frac{1}{2}a + \frac{1}{2}u + \frac{1}{2} \\ -a \end{pmatrix}$$

$$a_6 = \begin{pmatrix} au \\ -au - a + u + 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} au - \frac{1}{2}u + \frac{1}{2} \\ -au + a + 2u - 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{12}	$(y^2 - 7y + 1)^2$
c_2, c_6, c_7 c_{11}	$(y^2 + 3y + 1)^2$
c_3, c_5, c_8 c_{10}	$(y + 1)^4$
c_4, c_9	$16(16y^4 + 28y^2 + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_7^u		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$1.000000I$		
$a =$	$0.190983 + 0.809017I$	-8.88264	-4.00000
$b =$	$-1.61803I$		
$u =$	$1.000000I$		
$a =$	$1.309020 - 0.309017I$	-0.986960	-4.00000
$b =$	$0.618034I$		
$u =$	$-1.000000I$		
$a =$	$0.190983 - 0.809017I$	-8.88264	-4.00000
$b =$	$1.61803I$		
$u =$	$-1.000000I$		
$a =$	$1.309020 + 0.309017I$	-0.986960	-4.00000
$b =$	$-0.618034I$		

VIII. $\boldsymbol{I^u_8 = \langle b^2 + b + 1,\ -u^5a^2 + 2u^5a + \cdots - 2b - 1,\ -u^3a + u^3 + bu - au + b + u,\ u^6a^2 - 2u^6a + \cdots + u + 1\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} a \\ b \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} b + a \\ b \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{2}u^5a^2 + u^5a + \cdots - u - \frac{1}{2} \\ b + 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} \frac{1}{2}u^5a^2 - u^5a + \cdots + u + \frac{1}{2} \\ -b - 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -\frac{1}{2}u^5a^3 + \frac{3}{2}u^5a^2 + \cdots - \frac{1}{2}a + \frac{1}{2} \\ -au + 2u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{1}{2}u^5a^3 - \frac{3}{2}u^5a^2 + \cdots + \frac{3}{2}a - \frac{1}{2} \\ -u^2a + 2u^2 + b \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -a + u + 1 \\ u^3 - b + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{2}u^5a^2 + u^5a + \cdots - b - \frac{1}{2} \\ u^5a - u^4a - u^5 + 3u^3a + u^4 - u^2a - 2u^3 + 2au + u^2 - b - u + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 8b + 4$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_8^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$	$-4.05977I$	$-6.92820I$

IX. $I_9^u = \langle -u^5a^2 + 2u^5a + \cdots + b + a,\ u^6a^2 - 2u^6a + \cdots + u + 1\rangle$

(i) Arc colorings

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

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a \\ u^5a^2 - 2u^5a + 2u^3a^2 + u^5 - 3u^3a + a^2u - u^2a + u^3 - au + u^2 - a + u \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u^5a^2 - 2u^5a + 2u^3a^2 + u^5 - 3u^3a + a^2u - u^2a + u^3 - au + u^2 + u \\ u^5a^2 - 2u^5a + 2u^3a^2 + u^5 - 3u^3a + a^2u - u^2a + u^3 - au + u^2 - a + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^5a^3 + 3u^5a^2 + \cdots + a^2 - a \\ u^5a^2 - 2u^5a + \cdots - a + 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^5a^3 - 3u^5a^2 + \cdots - a^2 + a \\ -u^5a^2 + 2u^5a + \cdots + a - 1 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} u^4a^3 - 3u^4a^2 + a^3u^2 + 3u^4a - 2a^2u^2 - u^4 - a^2u + u^2a + 2au + a - u \\ u^5a^2 - 2u^5a + 2u^3a^2 + u^5 - 3u^3a + a^2u - 2u^2a + u^3 - au + 3u^2 - a + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^5a^3 - 3u^5a^2 + \cdots + 2a - 1 \\ u^3 + u - 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^5a^3 + 3u^5a^2 + \cdots - a + 1 \\ u^5a^2 - 3u^5a + \cdots - a + 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_9^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$	0	0

X. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$u^6(u^2-3u+1)^2(u^2+u+1)^3(u^{20}+12u^{19}+\cdots+27u+4)$ $\cdot(u^{68}+28u^{67}+\cdots+3540540u+405769)$
c_2,c_6,c_7 c_{11}	$u^6(u^2-u+1)^3(u^4+3u^2+1)(u^{20}+2u^{19}+\cdots+u+2)$ $\cdot(u^{68}+4u^{67}+\cdots+2840u+637)$
c_3,c_8	$81(u^2+1)^2(u^2-u+1)^2(u^4+u^3+2u^2+2u+1)^2$ $\cdot(9u^{20}+45u^{19}+\cdots+430u+89)(3u^{34}-6u^{33}+\cdots+u^2+1)^2$
c_4,c_9	$1024(u^2-u+1)(u^2+u+1)(u^4+u^3+\cdots+2u+1)(u^4+3u^3+2u^2+1)$ $\cdot(4u^4-4u^3+2u^2+2u+1)(4u^{20}-8u^{19}+\cdots+33u^2+9)$ $\cdot(64u^{68}+64u^{67}+\cdots+770022u+2211093)$
c_5,c_{10}	$81(u^2+1)^2(u^2-u+1)^2(u^4+u^3+2u^2+2u+1)^2$ $\cdot(9u^{20}+45u^{19}+\cdots+268u+89)(3u^{34}-6u^{33}+\cdots-4u+1)^2$
c_{12}	$u^6(u^2+u+1)^3(u^2+3u+1)^2(u^{20}+12u^{19}+\cdots+27u+4)$ $\cdot(u^{68}+28u^{67}+\cdots+3540540u+405769)$

XI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_{12}	$y^6(y^2-7y+1)^2(y^2+y+1)^3(y^{20}-8y^{19}+\cdots+655y+16)$ $\cdot(y^{68}+28y^{67}+\cdots+3856761155056y+164648481361)$
c_2, c_6, c_7 c_{11}	$y^6(y^2+y+1)^3(y^2+3y+1)^2(y^{20}+12y^{19}+\cdots+27y+4)$ $\cdot(y^{68}+28y^{67}+\cdots+3540540y+405769)$
c_3, c_8	$6561(y+1)^4(y^2+y+1)^2(y^4+3y^3+2y^2+1)^2$ $\cdot(81y^{20}+1161y^{19}+\cdots+40982y+7921)$ $\cdot(9y^{34}+240y^{33}+\cdots+2y+1)^2$
c_4, c_9	$1048576(y^2+y+1)^2(y^4-5y^3+\cdots+4y+1)(y^4+3y^3+2y^2+1)$ $\cdot(16y^4+28y^2+1)(16y^{20}+80y^{19}+\cdots+594y+81)$ $\cdot(4096y^{68}+106496y^{67}+\cdots+7083972171144y+4888932254649)$
c_5, c_{10}	$6561(y+1)^4(y^2+y+1)^2(y^4+3y^3+2y^2+1)^2$ $\cdot(81y^{20}+837y^{19}+\cdots+66838y+7921)$ $\cdot(9y^{34}+168y^{33}+\cdots+2y+1)^2$