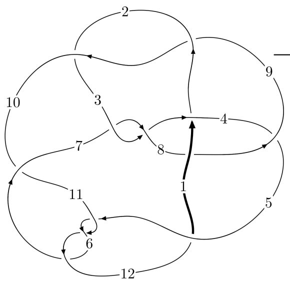
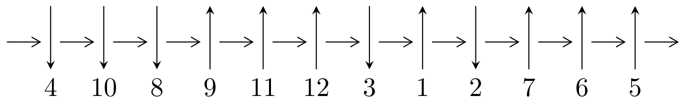
$12a_{1178}$ ($K12a_{1178}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 56u^{34} + 305u^{33} + \cdots + 2b - 284,\ 21u^{34} + 135u^{33} + \cdots + 4a - 182,\ u^{35} + 7u^{34} + \cdots + 32u - 8\rangle$$

$$I_2^u = \langle 3.02051 \times 10^{26} a^5u^{10} + 6.10493 \times 10^{26} a^4u^{10} + \cdots + 8.97858 \times 10^{27} a - 5.15875 \times 10^{27},$$
$$6u^{10}a^5 + 3u^{10}a^4 + \cdots - 21a - 22,\ u^{11} - u^{10} - 4u^9 + 3u^8 + 6u^7 - 2u^6 - 2u^5 - 3u^4 - 3u^3 + 3u^2 + 2u + 1\rangle$$

$$I_3^u = \langle u^{20} - 9u^{18} + 34u^{16} - 66u^{14} + 59u^{12} + 4u^{10} + u^9 - 50u^8 - 4u^7 + 25u^6 + 6u^5 + 9u^4 - 3u^3 - 6u^2 + b,$$
$$- u^{19} - u^{18} + \cdots + a + 1,$$
$$u^{21} - 10u^{19} + 42u^{17} - 92u^{15} + 99u^{13} - 14u^{11} + u^{10} - 78u^9 - 5u^8 + 60u^7 + 9u^6 + 9u^5 - 6u^4 - 18u^3 + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 122 representations.

[1] The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

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

I. $\boldsymbol{I^u_1 = \langle 56u^{34} + 305u^{33} + \cdots + 2b - 284,\ 21u^{34} + 135u^{33} + \cdots + 4a - 182,\ u^{35} + 7u^{34} + \cdots + 32u - 8\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_{12} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -5.25000u^{34} - 33.7500u^{33} + \cdots - 225.500u + 45.5000 \\ -28u^{34} - \frac{305}{2}u^{33} + \cdots - \frac{1307}{2}u + 142 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{75}{2}u^{34} - \frac{855}{4}u^{33} + \cdots - \frac{4301}{4}u + 227 \\ \frac{69}{4}u^{34} + \frac{401}{4}u^{33} + \cdots + 560u - 116 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{145}{8}u^{34} + \frac{829}{8}u^{33} + \cdots + 551u - \frac{229}{2} \\ -\frac{1}{4}u^{34} - \frac{11}{4}u^{33} + \cdots - \frac{49}{2}u + 5 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 5.75000u^{34} + 32.2500u^{33} + \cdots + 158.500u - 34.5000 \\ \frac{53}{2}u^{34} + 152u^{33} + \cdots + \frac{1537}{2}u - 162 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{47}{8}u^{34} - \frac{291}{8}u^{33} + \cdots - 232u + \frac{95}{2} \\ \frac{67}{4}u^{34} + \frac{369}{4}u^{33} + \cdots + \frac{877}{2}u - 93 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= -14u^{34} - 83u^{33} - 49u^{32} + 552u^{31} + 749u^{30} - 1851u^{29} - 2942u^{28} + 4360u^{27} + 5628u^{26} - 8667u^{25} - 3703u^{24} + 14324u^{23} - 8289u^{22} - 14914u^{21} + 26100u^{20} - 98u^{19} - 31837u^{18} + 26886u^{17} + 11105u^{16} - 37472u^{15} + 22359u^{14} + 14556u^{13} - 32711u^{12} + 16400u^{11} + 10929u^{10} - 19848u^9 + 10674u^8 + 3645u^7 - 8028u^6 + 5365u^5 - 279u^4 - 1570u^3 + 1326u^2 - 556u + 122$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{35} - 33u^{34} + \cdots - 40960u + 2048$
c_2, c_3, c_7 c_9	$u^{35} - u^{34} + \cdots + u - 1$
c_4, c_8	$u^{35} + 6u^{33} + \cdots + 2u - 1$
c_5, c_6, c_{11}	$u^{35} + 7u^{34} + \cdots + 32u - 8$
c_{10}, c_{12}	$u^{35} - 21u^{34} + \cdots - 40656u + 2664$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{35} - 11y^{34} + \cdots + 14680064y - 4194304$
c_2, c_3, c_7 c_9	$y^{35} - 35y^{34} + \cdots - 17y - 1$
c_4, c_8	$y^{35} + 12y^{34} + \cdots + 12y - 1$
c_5, c_6, c_{11}	$y^{35} - 29y^{34} + \cdots + 32y - 64$
c_{10}, c_{12}	$y^{35} + 23y^{34} + \cdots + 27880992y - 7096896$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.139537 + 0.931995I$ $a = -0.469976 + 1.183650I$ $b = 0.039825 + 0.846776I$	$-12.11410 + 3.47580I$	$-9.19807 - 3.18333I$
$u = 0.139537 - 0.931995I$ $a = -0.469976 - 1.183650I$ $b = 0.039825 - 0.846776I$	$-12.11410 - 3.47580I$	$-9.19807 + 3.18333I$
$u = 0.105864 + 0.897053I$ $a = 0.44787 + 2.53244I$ $b = 0.94342 + 1.35103I$	$-13.7151 + 12.5847I$	$-5.18347 - 6.53919I$
$u = 0.105864 - 0.897053I$ $a = 0.44787 - 2.53244I$ $b = 0.94342 - 1.35103I$	$-13.7151 - 12.5847I$	$-5.18347 + 6.53919I$
$u = 0.636350 + 0.611239I$ $a = 0.942619 - 0.315270I$ $b = 0.574414 - 0.905738I$	$-6.32739 - 3.08954I$	$-4.56075 + 2.58207I$
$u = 0.636350 - 0.611239I$ $a = 0.942619 + 0.315270I$ $b = 0.574414 + 0.905738I$	$-6.32739 + 3.08954I$	$-4.56075 - 2.58207I$
$u = 0.472041 + 0.666318I$ $a = 0.12197 - 1.43044I$ $b = -0.746358 - 1.022450I$	$-6.79949 + 7.60511I$	$-4.01817 - 7.64944I$
$u = 0.472041 - 0.666318I$ $a = 0.12197 + 1.43044I$ $b = -0.746358 + 1.022450I$	$-6.79949 - 7.60511I$	$-4.01817 + 7.64944I$
$u = 1.179240 + 0.305684I$ $a = 0.513879 - 0.597102I$ $b = 0.558931 - 1.032860I$	$0.229089 + 0.656619I$	$3.86417 - 1.98226I$
$u = 1.179240 - 0.305684I$ $a = 0.513879 + 0.597102I$ $b = 0.558931 + 1.032860I$	$0.229089 - 0.656619I$	$3.86417 + 1.98226I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.088955 + 0.772136I$ $a = -0.26673 - 2.09268I$ $b = -0.755605 - 0.993491I$	$-3.07455 + 3.26826I$	$1.60586 - 2.42356I$
$u = 0.088955 - 0.772136I$ $a = -0.26673 + 2.09268I$ $b = -0.755605 + 0.993491I$	$-3.07455 - 3.26826I$	$1.60586 + 2.42356I$
$u = 1.139170 + 0.518187I$ $a = -0.127484 + 0.654094I$ $b = 0.098871 + 0.884816I$	$-9.05046 + 1.64505I$	$-6.82659 - 2.03985I$
$u = 1.139170 - 0.518187I$ $a = -0.127484 - 0.654094I$ $b = 0.098871 - 0.884816I$	$-9.05046 - 1.64505I$	$-6.82659 + 2.03985I$
$u = 1.174450 + 0.465803I$ $a = -0.882414 + 0.762013I$ $b = -0.88026 + 1.32953I$	$-10.43630 - 7.73132I$	$-2.52329 + 3.10208I$
$u = 1.174450 - 0.465803I$ $a = -0.882414 - 0.762013I$ $b = -0.88026 - 1.32953I$	$-10.43630 + 7.73132I$	$-2.52329 - 3.10208I$
$u = -1.299980 + 0.228637I$ $a = -0.285197 - 1.010500I$ $b = 0.690456 - 0.023660I$	$4.00950 - 4.24760I$	$7.23862 + 6.55308I$
$u = -1.299980 - 0.228637I$ $a = -0.285197 + 1.010500I$ $b = 0.690456 + 0.023660I$	$4.00950 + 4.24760I$	$7.23862 - 6.55308I$
$u = 1.32721$ $a = 0.210158$ $b = 0.310775$	2.90599	1.01730
$u = -1.337390 + 0.048424I$ $a = 1.165230 - 0.179093I$ $b = -0.857438 + 0.443510I$	$6.13792 - 1.57371I$	$10.75089 + 1.90988I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.337390 - 0.048424I$ $a = 1.165230 + 0.179093I$ $b = -0.857438 - 0.443510I$	$6.13792 + 1.57371I$	$10.75089 - 1.90988I$
$u = -1.322170 + 0.332092I$ $a = -1.14041 - 1.41439I$ $b = 0.885409 - 0.964095I$	$1.35102 - 7.25772I$	$7.15814 + 5.17869I$
$u = -1.322170 - 0.332092I$ $a = -1.14041 + 1.41439I$ $b = 0.885409 + 0.964095I$	$1.35102 + 7.25772I$	$7.15814 - 5.17869I$
$u = -1.350510 + 0.404254I$ $a = 1.18027 + 1.81624I$ $b = -0.99393 + 1.35081I$	$-9.1437 - 17.2482I$	$0. + 8.79521I$
$u = -1.350510 - 0.404254I$ $a = 1.18027 - 1.81624I$ $b = -0.99393 - 1.35081I$	$-9.1437 + 17.2482I$	$0. - 8.79521I$
$u = -1.37576 + 0.42280I$ $a = 0.814461 + 0.541541I$ $b = -0.138556 + 0.789658I$	$-7.35335 - 8.32792I$	0
$u = -1.37576 - 0.42280I$ $a = 0.814461 - 0.541541I$ $b = -0.138556 - 0.789658I$	$-7.35335 + 8.32792I$	0
$u = -1.42904 + 0.19328I$ $a = -1.014210 - 0.478584I$ $b = 0.934761 - 1.000360I$	$-0.66389 - 10.53050I$	$0. + 8.08764I$
$u = -1.42904 - 0.19328I$ $a = -1.014210 + 0.478584I$ $b = 0.934761 + 1.000360I$	$-0.66389 + 10.53050I$	$0. - 8.08764I$
$u = 0.115996 + 0.532001I$ $a = -0.741619 - 0.675829I$ $b = -0.507252 + 0.043187I$	$-0.37214 + 1.40883I$	$0.98492 - 6.02743I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.115996 - 0.532001I$ $a = -0.741619 + 0.675829I$ $b = -0.507252 - 0.043187I$	$-0.37214 - 1.40883I$	$0.98492 + 6.02743I$
$u = -1.50719 + 0.09928I$ $a = -0.073091 + 0.314181I$ $b = -0.521031 - 0.600961I$	$0.874150 + 0.821107I$	0
$u = -1.50719 - 0.09928I$ $a = -0.073091 - 0.314181I$ $b = -0.521031 + 0.600961I$	$0.874150 - 0.821107I$	0
$u = 0.406834 + 0.217699I$ $a = -0.540240 + 0.373595I$ $b = 0.518952 + 0.467501I$	$0.843371 + 0.754361I$	$6.99963 - 3.56017I$
$u = 0.406834 - 0.217699I$ $a = -0.540240 - 0.373595I$ $b = 0.518952 - 0.467501I$	$0.843371 - 0.754361I$	$6.99963 + 3.56017I$

II. $I_2^u = \langle 3.02 \times 10^{26} a^5 u^{10} + 6.10 \times 10^{26} a^4 u^{10} + \cdots + 8.98 \times 10^{27} a - 5.16 \times 10^{27},\ 6u^{10}a^5 + 3u^{10}a^4 + \cdots - 21a - 22,\ u^{11} - u^{10} + \cdots + 2u + 1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_{12} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} a \\ -0.268598a^5u^{10} - 0.542878a^4u^{10} + \cdots - 7.98417a + 4.58740 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.321036a^5u^{10} - 0.325338a^4u^{10} + \cdots - 7.53353a - 3.76774 \\ -0.0259755a^5u^{10} + 0.100771a^4u^{10} + \cdots - 12.9385a - 4.93938 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.189655a^5u^{10} + 0.295091a^4u^{10} + \cdots + 3.91116a - 1.41976 \\ 0.214494a^5u^{10} - 0.0282051a^4u^{10} + \cdots - 1.53483a + 1.62382 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.0275683a^5u^{10} + 0.636168a^4u^{10} + \cdots + 7.09030a + 1.91159 \\ -0.441675a^5u^{10} - 0.266441a^4u^{10} + \cdots - 6.09828a + 5.22750 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.0475459a^5u^{10} + 0.162203a^4u^{10} + \cdots + 4.46863a - 1.45142 \\ 0.172998a^5u^{10} - 0.210633a^4u^{10} + \cdots - 1.90938a + 2.02365 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{5040392241000257011115835624}{3748496062896977702283729331}u^{10}a^5 - \frac{11721559679162749828004243384}{3748496062896977702283729331}u^{10}a^4 + \cdots - \frac{5075735830037470664374767476}{3748496062896977702283729331}a + \frac{9670853239799093529630437046}{3748496062896977702283729331}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^3+u^2-1)^{22}$
c_2, c_3, c_7 c_9	$u^{66}+u^{65}+\cdots+16520u-4657$
c_4, c_8	$u^{66}+3u^{65}+\cdots-4900u-599$
c_5, c_6, c_{11}	$(u^{11}-u^{10}-4u^9+3u^8+6u^7-2u^6-2u^5-3u^4-3u^3+3u^2+2u+1)^6$
c_{10}, c_{12}	$(u^{11}+3u^{10}+\cdots-2u-1)^6$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^3 - y^2 + 2y - 1)^{22}$
c_2, c_3, c_7 c_9	$y^{66} - 57y^{65} + \cdots + 855089512y + 21687649$
c_4, c_8	$y^{66} + 19y^{65} + \cdots + 9965280y + 358801$
c_5, c_6, c_{11}	$(y^{11} - 9y^{10} + \cdots - 2y - 1)^6$
c_{10}, c_{12}	$(y^{11} + 11y^{10} + \cdots + 6y - 1)^6$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.14725$ $a = -0.681685 + 0.142265I$ $b = -0.203831 - 1.332020I$	$0.28470 + 2.82812I$	$-0.86650 - 2.97945I$
$u = -1.14725$ $a = -0.681685 - 0.142265I$ $b = -0.203831 + 1.332020I$	$0.28470 - 2.82812I$	$-0.86650 + 2.97945I$
$u = -1.14725$ $a = -0.31870 + 1.52370I$ $b = 0.407188 + 0.993368I$	$0.28470 + 2.82812I$	$-0.86650 - 2.97945I$
$u = -1.14725$ $a = -0.31870 - 1.52370I$ $b = 0.407188 - 0.993368I$	$0.28470 - 2.82812I$	$-0.86650 + 2.97945I$
$u = -1.14725$ $a = -2.88593$ $b = 1.63935$	-3.85288	-7.39580
$u = -1.14725$ $a = -4.00191$ $b = -0.239197$	-3.85288	-7.39580
$u = -0.044199 + 0.849205I$ $a = 0.72801 - 1.52143I$ $b = 0.825388 - 0.962313I$	$-7.55328 - 0.21340I$	$-4.55146 - 0.15703I$
$u = -0.044199 + 0.849205I$ $a = 0.65416 + 1.77567I$ $b = -0.047317 + 0.807179I$	$-7.55328 - 0.21340I$	$-4.55146 - 0.15703I$
$u = -0.044199 + 0.849205I$ $a = 0.00071 - 2.02802I$ $b = 0.774141 - 0.907919I$	$-7.55328 - 5.86965I$	$-4.55146 + 5.80187I$
$u = -0.044199 + 0.849205I$ $a = -0.67415 + 2.52234I$ $b = 0.057490 + 0.752723I$	$-11.69090 - 3.04152I$	$-11.08072 + 2.82242I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.044199 + 0.849205I$ $a = 2.42363 + 2.14160I$ $b = 1.83368 + 1.32855I$	$-11.69090 - 3.04152I$	$-11.08072 + 2.82242I$
$u = -0.044199 + 0.849205I$ $a = -0.87468 + 3.12856I$ $b = -1.00287 + 1.66762I$	$-7.55328 - 5.86965I$	$-4.55146 + 5.80187I$
$u = -0.044199 - 0.849205I$ $a = 0.72801 + 1.52143I$ $b = 0.825388 + 0.962313I$	$-7.55328 + 0.21340I$	$-4.55146 + 0.15703I$
$u = -0.044199 - 0.849205I$ $a = 0.65416 - 1.77567I$ $b = -0.047317 - 0.807179I$	$-7.55328 + 0.21340I$	$-4.55146 + 0.15703I$
$u = -0.044199 - 0.849205I$ $a = 0.00071 + 2.02802I$ $b = 0.774141 + 0.907919I$	$-7.55328 + 5.86965I$	$-4.55146 - 5.80187I$
$u = -0.044199 - 0.849205I$ $a = -0.67415 - 2.52234I$ $b = 0.057490 - 0.752723I$	$-11.69090 + 3.04152I$	$-11.08072 - 2.82242I$
$u = -0.044199 - 0.849205I$ $a = 2.42363 - 2.14160I$ $b = 1.83368 - 1.32855I$	$-11.69090 + 3.04152I$	$-11.08072 - 2.82242I$
$u = -0.044199 - 0.849205I$ $a = -0.87468 - 3.12856I$ $b = -1.00287 - 1.66762I$	$-7.55328 + 5.86965I$	$-4.55146 - 5.80187I$
$u = -1.232090 + 0.392876I$ $a = -0.001588 + 1.162910I$ $b = -0.022577 + 0.868095I$	$-3.88773 - 4.24511I$	$-1.28155 + 3.61318I$
$u = -1.232090 + 0.392876I$ $a = -0.787317 - 0.081147I$ $b = -0.708436 - 1.070380I$	$-3.88773 - 4.24511I$	$-1.28155 + 3.61318I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.232090+0.392876I$ $a=-0.113083-0.696667I$ $b=-0.730235-0.947386I$	$-3.88773+1.41114I$	$-1.28155-2.34572I$
$u=-1.232090+0.392876I$ $a=\quad 1.43869+0.88464I$ $b=\quad 0.89523+1.68771I$	$-3.88773+1.41114I$	$-1.28155-2.34572I$
$u=-1.232090+0.392876I$ $a=\quad 1.52441+1.86194I$ $b=-0.055694+0.670879I$	$-8.02531-1.41699I$	$-7.81082+0.63373I$
$u=-1.232090+0.392876I$ $a=\quad 0.32325+2.50924I$ $b=-1.89288+1.18137I$	$-8.02531-1.41699I$	$-7.81082+0.63373I$
$u=-1.232090-0.392876I$ $a=-0.001588-1.162910I$ $b=-0.022577-0.868095I$	$-3.88773+4.24511I$	$-1.28155-3.61318I$
$u=-1.232090-0.392876I$ $a=-0.787317+0.081147I$ $b=-0.708436+1.070380I$	$-3.88773+4.24511I$	$-1.28155-3.61318I$
$u=-1.232090-0.392876I$ $a=-0.113083+0.696667I$ $b=-0.730235+0.947386I$	$-3.88773-1.41114I$	$-1.28155+2.34572I$
$u=-1.232090-0.392876I$ $a=\quad 1.43869-0.88464I$ $b=\quad 0.89523-1.68771I$	$-3.88773-1.41114I$	$-1.28155+2.34572I$
$u=-1.232090-0.392876I$ $a=\quad 1.52441-1.86194I$ $b=-0.055694-0.670879I$	$-8.02531+1.41699I$	$-7.81082-0.63373I$
$u=-1.232090-0.392876I$ $a=\quad 0.32325-2.50924I$ $b=-1.89288-1.18137I$	$-8.02531+1.41699I$	$-7.81082-0.63373I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.317220 + 0.129556I$ $a = 0.357508 - 0.783708I$ $b = -0.127941 + 0.198219I$	$3.27094 + 0.11860I$	$5.30912 - 1.13842I$
$u = 1.317220 + 0.129556I$ $a = 0.091337 + 0.694344I$ $b = 0.776455 - 0.377674I$	$3.27094 + 0.11860I$	$5.30912 - 1.13842I$
$u = 1.317220 + 0.129556I$ $a = 1.51101 - 0.25470I$ $b = -1.07397 - 1.07535I$	$3.27094 + 5.77484I$	$5.30912 - 7.09731I$
$u = 1.317220 + 0.129556I$ $a = -0.224220 + 0.066922I$ $b = 0.99581 - 1.28980I$	$-0.86664 + 2.94672I$	$-1.22015 - 4.11787I$
$u = 1.317220 + 0.129556I$ $a = 0.77168 - 1.59391I$ $b = -0.357770 - 1.008310I$	$-0.86664 + 2.94672I$	$-1.22015 - 4.11787I$
$u = 1.317220 + 0.129556I$ $a = -1.80083 - 0.09949I$ $b = 0.610792 + 0.587246I$	$3.27094 + 5.77484I$	$5.30912 - 7.09731I$
$u = 1.317220 - 0.129556I$ $a = 0.357508 + 0.783708I$ $b = -0.127941 - 0.198219I$	$3.27094 - 0.11860I$	$5.30912 + 1.13842I$
$u = 1.317220 - 0.129556I$ $a = 0.091337 - 0.694344I$ $b = 0.776455 + 0.377674I$	$3.27094 - 0.11860I$	$5.30912 + 1.13842I$
$u = 1.317220 - 0.129556I$ $a = 1.51101 + 0.25470I$ $b = -1.07397 + 1.07535I$	$3.27094 - 5.77484I$	$5.30912 + 7.09731I$
$u = 1.317220 - 0.129556I$ $a = -0.224220 - 0.066922I$ $b = 0.99581 + 1.28980I$	$-0.86664 - 2.94672I$	$-1.22015 + 4.11787I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.317220 - 0.129556I$ $a = 0.77168 + 1.59391I$ $b = -0.357770 + 1.008310I$	$-0.86664 - 2.94672I$	$-1.22015 + 4.11787I$
$u = 1.317220 - 0.129556I$ $a = -1.80083 + 0.09949I$ $b = 0.610792 - 0.587246I$	$3.27094 - 5.77484I$	$5.30912 + 7.09731I$
$u = 1.304640 + 0.385413I$ $a = 0.604532 - 1.165350I$ $b = -0.919978 - 0.859160I$	$-3.34246 + 4.64712I$	$-0.26116 - 2.57516I$
$u = 1.304640 + 0.385413I$ $a = -1.17144 + 0.97350I$ $b = 0.108018 + 0.747505I$	$-3.34246 + 4.64712I$	$-0.26116 - 2.57516I$
$u = 1.304640 + 0.385413I$ $a = -1.62199 - 0.36591I$ $b = -1.76774 + 1.44412I$	$-7.48004 + 7.47524I$	$-6.79043 - 5.55460I$
$u = 1.304640 + 0.385413I$ $a = 0.00454 + 1.73852I$ $b = -0.053146 + 0.819466I$	$-7.48004 + 7.47524I$	$-6.79043 - 5.55460I$
$u = 1.304640 + 0.385413I$ $a = 1.36908 - 1.57746I$ $b = -0.807452 - 0.868914I$	$-3.34246 + 10.30340I$	$-0.26116 - 8.53405I$
$u = 1.304640 + 0.385413I$ $a = -1.27201 + 2.16803I$ $b = 1.09048 + 1.63810I$	$-3.34246 + 10.30340I$	$-0.26116 - 8.53405I$
$u = 1.304640 - 0.385413I$ $a = 0.604532 + 1.165350I$ $b = -0.919978 + 0.859160I$	$-3.34246 - 4.64712I$	$-0.26116 + 2.57516I$
$u = 1.304640 - 0.385413I$ $a = -1.17144 - 0.97350I$ $b = 0.108018 - 0.747505I$	$-3.34246 - 4.64712I$	$-0.26116 + 2.57516I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.304640 - 0.385413I$ $a = -1.62199 + 0.36591I$ $b = -1.76774 - 1.44412I$	$-7.48004 - 7.47524I$	$-6.79043 + 5.55460I$
$u = 1.304640 - 0.385413I$ $a = 0.00454 - 1.73852I$ $b = -0.053146 - 0.819466I$	$-7.48004 - 7.47524I$	$-6.79043 + 5.55460I$
$u = 1.304640 - 0.385413I$ $a = 1.36908 + 1.57746I$ $b = -0.807452 + 0.868914I$	$-3.34246 - 10.30340I$	$-0.26116 + 8.53405I$
$u = 1.304640 - 0.385413I$ $a = -1.27201 - 2.16803I$ $b = 1.09048 - 1.63810I$	$-3.34246 - 10.30340I$	$-0.26116 + 8.53405I$
$u = -0.271947 + 0.385187I$ $a = 0.517022 - 0.454203I$ $b = 0.045920 + 0.690303I$	$-1.60594 + 1.69682I$	$-0.47805 + 3.07840I$
$u = -0.271947 + 0.385187I$ $a = -0.63681 - 1.75387I$ $b = -1.104940 - 0.853877I$	$-5.74353 - 1.13130I$	$-7.00731 + 6.05785I$
$u = -0.271947 + 0.385187I$ $a = -0.43984 - 1.84859I$ $b = 0.753427 - 1.132850I$	$-1.60594 - 3.95942I$	$-0.47805 + 9.03730I$
$u = -0.271947 + 0.385187I$ $a = -1.96371 - 0.33369I$ $b = -0.511166 - 0.764927I$	$-1.60594 + 1.69682I$	$-0.47805 + 3.07840I$
$u = -0.271947 + 0.385187I$ $a = 1.81520 + 0.94189I$ $b = -0.468912 + 0.757250I$	$-1.60594 - 3.95942I$	$-0.47805 + 9.03730I$
$u = -0.271947 + 0.385187I$ $a = 0.39122 - 4.07994I$ $b = 0.482757 - 0.696049I$	$-5.74353 - 1.13130I$	$-7.00731 + 6.05785I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.271947 - 0.385187I$ $a = 0.517022 + 0.454203I$ $b = 0.045920 - 0.690303I$	$-1.60594 - 1.69682I$	$-0.47805 - 3.07840I$
$u = -0.271947 - 0.385187I$ $a = -0.63681 + 1.75387I$ $b = -1.104940 + 0.853877I$	$-5.74353 + 1.13130I$	$-7.00731 - 6.05785I$
$u = -0.271947 - 0.385187I$ $a = -0.43984 + 1.84859I$ $b = 0.753427 + 1.132850I$	$-1.60594 + 3.95942I$	$-0.47805 - 9.03730I$
$u = -0.271947 - 0.385187I$ $a = -1.96371 + 0.33369I$ $b = -0.511166 + 0.764927I$	$-1.60594 - 1.69682I$	$-0.47805 - 3.07840I$
$u = -0.271947 - 0.385187I$ $a = 1.81520 - 0.94189I$ $b = -0.468912 - 0.757250I$	$-1.60594 + 3.95942I$	$-0.47805 - 9.03730I$
$u = -0.271947 - 0.385187I$ $a = 0.39122 + 4.07994I$ $b = 0.482757 + 0.696049I$	$-5.74353 + 1.13130I$	$-7.00731 - 6.05785I$

III. $\boldsymbol{I^u_3 =}$
$\boldsymbol{\langle u^{20} - 9u^{18} + \cdots - 6u^2 + b,\ -u^{19} - u^{18} + \cdots + a + 1,\ u^{21} - 10u^{19} + \cdots - 18u^3 + 1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^{19} + u^{18} + \cdots + 5u - 1 \\ -u^{20} + 9u^{18} + \cdots + 3u^3 + 6u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^{20} - u^{19} + \cdots + 6u + 3 \\ u^{19} - 8u^{17} + \cdots + 2u - 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^{20} + u^{19} + \cdots - 17u^2 - 4u \\ -u^{20} + u^{19} + \cdots + 3u - 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^{19} + u^{18} + \cdots + 13u^2 + 5u \\ -u^{20} + u^{19} + \cdots + 9u^3 + 5u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^{20} + u^{19} + \cdots - 17u^2 - 3u \\ -u^{20} + 2u^{19} + \cdots + 2u - 2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes
$= 7u^{20} - 4u^{19} - 59u^{18} + 33u^{17} + 199u^{16} - 107u^{15} - 312u^{14} + 155u^{13} + 138u^{12} - 42u^{11} + 219u^{10} - 138u^9 - 245u^8 + 102u^7 - 33u^6 + 61u^5 + 85u^4 - 52u^3 + 20u^2 - 13u - 4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{21} - 6u^{20} + \cdots - 2u^2 + 1$
c_2, c_7	$u^{21} + u^{20} + \cdots + u + 1$
c_3, c_9	$u^{21} - u^{20} + \cdots + u - 1$
c_4, c_8	$u^{21} + 3u^{19} + \cdots + 2u^2 - 1$
c_5, c_6	$u^{21} - 10u^{19} + \cdots - 18u^3 + 1$
c_{10}, c_{12}	$u^{21} + 6u^{19} + \cdots + 3u^2 - 1$
c_{11}	$u^{21} - 10u^{19} + \cdots - 18u^3 - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{21} - 10y^{20} + \cdots + 4y - 1$
c_2, c_3, c_7 c_9	$y^{21} - 21y^{20} + \cdots + 15y - 1$
c_4, c_8	$y^{21} + 6y^{20} + \cdots + 4y - 1$
c_5, c_6, c_{11}	$y^{21} - 20y^{20} + \cdots + 12y^2 - 1$
c_{10}, c_{12}	$y^{21} + 12y^{20} + \cdots + 6y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.062614 + 0.857160I$ $a = -0.87964 + 1.46799I$ $b = -0.753449 + 0.596686I$	$-10.38470 + 2.69700I$	$-3.62255 - 0.89519I$
$u = 0.062614 - 0.857160I$ $a = -0.87964 - 1.46799I$ $b = -0.753449 - 0.596686I$	$-10.38470 - 2.69700I$	$-3.62255 + 0.89519I$
$u = 1.18462$ $a = 3.69060$ $b = -1.03309$	-3.22448	8.49570
$u = -1.235030 + 0.104057I$ $a = 0.045191 - 0.732622I$ $b = 0.152862 - 1.129160I$	$1.16566 - 3.99750I$	$3.65944 + 7.63178I$
$u = -1.235030 - 0.104057I$ $a = 0.045191 + 0.732622I$ $b = 0.152862 + 1.129160I$	$1.16566 + 3.99750I$	$3.65944 - 7.63178I$
$u = -1.234780 + 0.272929I$ $a = -0.531801 - 0.777750I$ $b = -0.574518 - 1.263340I$	$-0.513798 + 0.234672I$	$-0.88949 - 1.85883I$
$u = -1.234780 - 0.272929I$ $a = -0.531801 + 0.777750I$ $b = -0.574518 + 1.263340I$	$-0.513798 - 0.234672I$	$-0.88949 + 1.85883I$
$u = 1.212920 + 0.392860I$ $a = -0.25622 + 1.81030I$ $b = 0.857416 + 0.486218I$	$-6.84641 + 1.79152I$	$-0.05538 - 3.12575I$
$u = 1.212920 - 0.392860I$ $a = -0.25622 - 1.81030I$ $b = 0.857416 - 0.486218I$	$-6.84641 - 1.79152I$	$-0.05538 + 3.12575I$
$u = -0.072517 + 0.710236I$ $a = -0.05689 - 2.37401I$ $b = 0.689130 - 1.135240I$	$-4.06754 - 3.77401I$	$-6.57499 + 5.11487I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.072517 - 0.710236I$ $a = -0.05689 + 2.37401I$ $b = 0.689130 + 1.135240I$	$-4.06754 + 3.77401I$	$-6.57499 - 5.11487I$
$u = 1.323560 + 0.298366I$ $a = 1.40817 - 1.17675I$ $b = -0.816737 - 1.050640I$	$0.33148 + 7.43161I$	$-1.41601 - 6.66446I$
$u = 1.323560 - 0.298366I$ $a = 1.40817 + 1.17675I$ $b = -0.816737 + 1.050640I$	$0.33148 - 7.43161I$	$-1.41601 + 6.66446I$
$u = -1.316400 + 0.393822I$ $a = 0.572655 + 0.411414I$ $b = 0.660701 + 0.695110I$	$-6.07430 - 7.19164I$	$0.23497 + 3.77817I$
$u = -1.316400 - 0.393822I$ $a = 0.572655 - 0.411414I$ $b = 0.660701 - 0.695110I$	$-6.07430 + 7.19164I$	$0.23497 - 3.77817I$
$u = 1.391350 + 0.102602I$ $a = 0.030191 + 0.648490I$ $b = 0.447297 - 0.579322I$	$3.05033 - 0.86818I$	$1.73934 + 7.74915I$
$u = 1.391350 - 0.102602I$ $a = 0.030191 - 0.648490I$ $b = 0.447297 + 0.579322I$	$3.05033 + 0.86818I$	$1.73934 - 7.74915I$
$u = -1.47523$ $a = -0.307400$ $b = -0.423333$	0.601618	-3.40550
$u = 0.385686$ $a = 3.97045$ $b = 0.760533$	-5.70574	-6.72950
$u = -0.179252 + 0.337282I$ $a = -2.00847 + 0.16947I$ $b = -0.314759 - 0.878350I$	$-2.10523 + 2.46905I$	$-7.25568 - 4.96271I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.179252 - 0.337282I$ $a = -2.00847 - 0.16947I$ $b = -0.314759 + 0.878350I$	$-2.10523 - 2.46905I$	$-7.25568 + 4.96271I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^3+u^2-1)^{22})(u^{21}-6u^{20}+\cdots-2u^2+1)$ $\cdot(u^{35}-33u^{34}+\cdots-40960u+2048)$
c_2, c_7	$(u^{21}+u^{20}+\cdots+u+1)(u^{35}-u^{34}+\cdots+u-1)$ $\cdot(u^{66}+u^{65}+\cdots+16520u-4657)$
c_3, c_9	$(u^{21}-u^{20}+\cdots+u-1)(u^{35}-u^{34}+\cdots+u-1)$ $\cdot(u^{66}+u^{65}+\cdots+16520u-4657)$
c_4, c_8	$(u^{21}+3u^{19}+\cdots+2u^2-1)(u^{35}+6u^{33}+\cdots+2u-1)$ $\cdot(u^{66}+3u^{65}+\cdots-4900u-599)$
c_5, c_6	$(u^{11}-u^{10}-4u^9+3u^8+6u^7-2u^6-2u^5-3u^4-3u^3+3u^2+2u+1)^6$ $\cdot(u^{21}-10u^{19}+\cdots-18u^3+1)(u^{35}+7u^{34}+\cdots+32u-8)$
c_{10}, c_{12}	$((u^{11}+3u^{10}+\cdots-2u-1)^6)(u^{21}+6u^{19}+\cdots+3u^2-1)$ $\cdot(u^{35}-21u^{34}+\cdots-40656u+2664)$
c_{11}	$(u^{11}-u^{10}-4u^9+3u^8+6u^7-2u^6-2u^5-3u^4-3u^3+3u^2+2u+1)^6$ $\cdot(u^{21}-10u^{19}+\cdots-18u^3-1)(u^{35}+7u^{34}+\cdots+32u-8)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y^3-y^2+2y-1)^{22})(y^{21}-10y^{20}+\cdots+4y-1)$ $\cdot(y^{35}-11y^{34}+\cdots+14680064y-4194304)$
c_2, c_3, c_7 c_9	$(y^{21}-21y^{20}+\cdots+15y-1)(y^{35}-35y^{34}+\cdots-17y-1)$ $\cdot(y^{66}-57y^{65}+\cdots+855089512y+21687649)$
c_4, c_8	$(y^{21}+6y^{20}+\cdots+4y-1)(y^{35}+12y^{34}+\cdots+12y-1)$ $\cdot(y^{66}+19y^{65}+\cdots+9965280y+358801)$
c_5, c_6, c_{11}	$((y^{11}-9y^{10}+\cdots-2y-1)^6)(y^{21}-20y^{20}+\cdots+12y^2-1)$ $\cdot(y^{35}-29y^{34}+\cdots+32y-64)$
c_{10}, c_{12}	$((y^{11}+11y^{10}+\cdots+6y-1)^6)(y^{21}+12y^{20}+\cdots+6y-1)$ $\cdot(y^{35}+23y^{34}+\cdots+27880992y-7096896)$