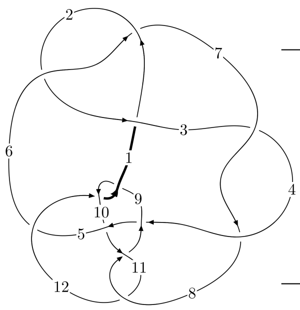
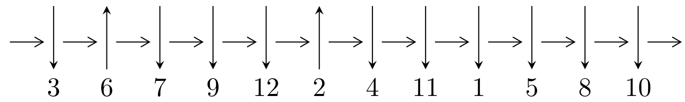
$12a_{0231}$ $(K12a_{0231})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u = \langle & 6651u^{44} + 145618u^{43} + \cdots + 524288b - 466223,\\
& 524233u^{44} - 2692162u^{43} + \cdots + 524288a - 643773,\ u^{45} - 5u^{44} + \cdots - 4u - 1\rangle\\
I_2^u = \langle & 1.55401 \times 10^{94}u^{69} + 1.52437 \times 10^{95}u^{68} + \cdots + 1.07854 \times 10^{94}b + 7.18821 \times 10^{93},\\
& -1.16571 \times 10^{94}u^{69} - 1.26580 \times 10^{95}u^{68} + \cdots + 1.07854 \times 10^{94}a - 8.60428 \times 10^{94},\\
& u^{70} + 11u^{69} + \cdots + 16u + 1\rangle\\
I_3^u = \langle & b - a,\ 32a^5 - 16a^4 - 16a^3 + 4a^2 + 2a + 1,\ u - 1\rangle\\
I_4^u = \langle & au + b + a - u + 1,\ a^2 - 2au - a + u,\ u^2 + 1\rangle
\end{aligned}
$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 124 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. $\boldsymbol{I_1^u = \langle 6651u^{44} + 145618u^{43} + \cdots + 524288b - 466223,\ 5.24 \times 10^5 u^{44} - 2.69 \times 10^6 u^{43} + \cdots + 5.24 \times 10^5 a - 6.44 \times 10^5,\ u^{45} - 5u^{44} + \cdots - 4u - 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.999895u^{44} + 5.13489u^{43} + \cdots + 14.6410u + 1.22790 \\ -0.0126858u^{44} - 0.277744u^{43} + \cdots + 3.08293u + 0.889250 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} \frac{1}{16}u^{44} - \frac{5}{16}u^{43} + \cdots - \frac{1}{4}u^2 + \frac{31}{16}u \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -1.01258u^{44} + 4.85715u^{43} + \cdots + 17.7239u + 2.11715 \\ -0.0126858u^{44} - 0.277744u^{43} + \cdots + 3.08293u + 0.889250 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{1}{16}u^{43} - \frac{5}{16}u^{42} + \cdots - \frac{1}{4}u + \frac{15}{16} \\ -u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 9.53674 \times 10^{-7}u^{44} - 5.72205 \times 10^{-6}u^{43} + \cdots - 5.00000u + 2.00000 \\ 4.76837 \times 10^{-7}u^{44} - 2.86102 \times 10^{-6}u^{43} + \cdots - 1.00000u - 4.76837 \times 10^{-7} \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 0.132458u^{44} - 0.552269u^{43} + \cdots + 10.2747u + 0.660954 \\ -0.193096u^{44} + 1.22194u^{43} + \cdots + 1.49102u + 0.299046 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.658722u^{44} + 3.16490u^{43} + \cdots + 13.8025u + 1.24059 \\ 0.332701u^{44} - 1.98454u^{43} + \cdots + 1.52910u + 0.637812 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.0177879u^{44} + 0.166283u^{43} + \cdots + 9.80950u - 1.04152 \\ -0.00756836u^{44} + 0.106544u^{43} + \cdots + 1.77556u - 0.0534439 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{853951}{4194304}u^{44} + \frac{1865277}{2097152}u^{43} + \cdots + \frac{22965053}{4194304}u - \frac{24110657}{4194304}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{45} + 24u^{44} + \cdots + 145u - 16$
c_2, c_6	$u^{45} - 2u^{44} + \cdots + 5u + 4$
c_3, c_7	$u^{45} + 2u^{44} + \cdots + 621u + 292$
c_4, c_5	$32(32u^{45} - 16u^{44} + \cdots + 12u + 4)$
c_8, c_9, c_{11} c_{12}	$u^{45} + 5u^{44} + \cdots - 4u + 1$
c_{10}	$u^{45} + 3u^{44} + \cdots + 5632u + 2048$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{45} - 4y^{44} + \cdots + 44993y - 256$
c_2, c_6	$y^{45} + 24y^{44} + \cdots + 145y - 16$
c_3, c_7	$y^{45} - 32y^{44} + \cdots + 1265729y - 85264$
c_4, c_5	$1024(1024y^{45} - 5376y^{44} + \cdots + 320y - 16)$
c_8, c_9, c_{11} c_{12}	$y^{45} + 17y^{44} + \cdots - 1030y^2 - 1$
c_{10}	$y^{45} + 9y^{44} + \cdots - 83623936y - 4194304$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.520727 + 0.939578I$ $a = 0.758964 + 0.066469I$ $b = 0.779771 + 0.243421I$	$-4.56636 - 1.73156I$	$-11.99281 + 3.31846I$
$u = 0.520727 - 0.939578I$ $a = 0.758964 - 0.066469I$ $b = 0.779771 - 0.243421I$	$-4.56636 + 1.73156I$	$-11.99281 - 3.31846I$
$u = 0.420339 + 0.991396I$ $a = -0.974005 - 0.017820I$ $b = -0.710296 - 0.326186I$	$-0.21603 - 5.35749I$	$-6.20050 + 6.92376I$
$u = 0.420339 - 0.991396I$ $a = -0.974005 + 0.017820I$ $b = -0.710296 + 0.326186I$	$-0.21603 + 5.35749I$	$-6.20050 - 6.92376I$
$u = 0.776889 + 0.479998I$ $a = -0.168820 - 0.167222I$ $b = -0.630907 + 0.111072I$	$-2.93036 - 1.75870I$	$-17.4213 + 1.7562I$
$u = 0.776889 - 0.479998I$ $a = -0.168820 + 0.167222I$ $b = -0.630907 - 0.111072I$	$-2.93036 + 1.75870I$	$-17.4213 - 1.7562I$
$u = 0.217946 + 0.864786I$ $a = -1.40293 - 0.70903I$ $b = -0.536590 - 0.217455I$	$2.55612 - 3.52730I$	$-8.10907 + 10.18535I$
$u = 0.217946 - 0.864786I$ $a = -1.40293 + 0.70903I$ $b = -0.536590 + 0.217455I$	$2.55612 + 3.52730I$	$-8.10907 - 10.18535I$
$u = 0.442791 + 1.050870I$ $a = 0.933478 - 0.112856I$ $b = 0.753141 + 0.378689I$	$-3.07301 - 10.38100I$	$-8.00000 + 9.73173I$
$u = 0.442791 - 1.050870I$ $a = 0.933478 + 0.112856I$ $b = 0.753141 - 0.378689I$	$-3.07301 + 10.38100I$	$-8.00000 - 9.73173I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.297785+1.113910I$ $a=\ 0.03350+2.19997I$ $b=\ 0.673195-0.752405I$	$4.65659-0.00210I$	$-3.78722-3.26916I$
$u=-0.297785-1.113910I$ $a=\ 0.03350-2.19997I$ $b=\ 0.673195+0.752405I$	$4.65659+0.00210I$	$-3.78722+3.26916I$
$u=\ 0.113962+0.805614I$ $a=\ 1.38924+1.35506I$ $b=\ 0.518517+0.141686I$	$2.17122+1.50395I$	$-11.94091+1.99102I$
$u=\ 0.113962-0.805614I$ $a=\ 1.38924-1.35506I$ $b=\ 0.518517-0.141686I$	$2.17122-1.50395I$	$-11.94091-1.99102I$
$u=-0.412048+0.695424I$ $a=-0.61411-2.35550I$ $b=-1.116650-0.046522I$	$-6.28912+6.14694I$	$-10.86325-8.13273I$
$u=-0.412048-0.695424I$ $a=-0.61411+2.35550I$ $b=-1.116650+0.046522I$	$-6.28912-6.14694I$	$-10.86325+8.13273I$
$u=\ 1.198270+0.098629I$ $a=-0.0225006+0.0343167I$ $b=-0.159457+0.519154I$	$-1.73909+1.72292I$	$5.26680-11.72526I$
$u=\ 1.198270-0.098629I$ $a=-0.0225006-0.0343167I$ $b=-0.159457-0.519154I$	$-1.73909-1.72292I$	$5.26680+11.72526I$
$u=-0.354317+1.160890I$ $a=-0.08135-2.03091I$ $b=-0.760215+0.900488I$	$6.42066+5.09294I$	$0.-6.60661I$
$u=-0.354317-1.160890I$ $a=-0.08135+2.03091I$ $b=-0.760215-0.900488I$	$6.42066-5.09294I$	$0.+6.60661I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.470835 + 1.120420I$ $a = 0.30475 + 1.97067I$ $b = 1.051690 - 0.899049I$	$1.14313 + 7.15516I$	$-8.00000 - 7.04629I$
$u = -0.470835 - 1.120420I$ $a = 0.30475 - 1.97067I$ $b = 1.051690 + 0.899049I$	$1.14313 - 7.15516I$	$-8.00000 + 7.04629I$
$u = -0.334613 + 0.649816I$ $a = 0.57160 + 2.36102I$ $b = 0.967229 + 0.125022I$	$-2.56741 + 1.44381I$	$-7.78555 - 4.48019I$
$u = -0.334613 - 0.649816I$ $a = 0.57160 - 2.36102I$ $b = 0.967229 - 0.125022I$	$-2.56741 - 1.44381I$	$-7.78555 + 4.48019I$
$u = 1.224740 + 0.401588I$ $a = -0.1045230 + 0.0475191I$ $b = -0.584434 + 0.569316I$	$-4.17784 + 0.91994I$	0
$u = 1.224740 - 0.401588I$ $a = -0.1045230 - 0.0475191I$ $b = -0.584434 - 0.569316I$	$-4.17784 - 0.91994I$	0
$u = 1.217570 + 0.485388I$ $a = 0.1307500 - 0.0531710I$ $b = 0.691032 - 0.549753I$	$-7.82065 - 3.25322I$	0
$u = 1.217570 - 0.485388I$ $a = 0.1307500 + 0.0531710I$ $b = 0.691032 + 0.549753I$	$-7.82065 + 3.25322I$	0
$u = -0.375360 + 0.563080I$ $a = -0.54767 - 2.43496I$ $b = -1.010960 - 0.292068I$	$-6.31075 - 3.17495I$	$-10.44526 - 1.01574I$
$u = -0.375360 - 0.563080I$ $a = -0.54767 + 2.43496I$ $b = -1.010960 + 0.292068I$	$-6.31075 + 3.17495I$	$-10.44526 + 1.01574I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.445965 + 1.253320I$ $a = -0.15883 - 1.79924I$ $b = -0.89148 + 1.18060I$	$7.27138 + 7.55038I$	0
$u = -0.445965 - 1.253320I$ $a = -0.15883 + 1.79924I$ $b = -0.89148 - 1.18060I$	$7.27138 - 7.55038I$	0
$u = 1.294890 + 0.408163I$ $a = 0.1009240 - 0.0680235I$ $b = 0.600371 - 0.662127I$	$-7.44445 + 5.45779I$	0
$u = 1.294890 - 0.408163I$ $a = 0.1009240 + 0.0680235I$ $b = 0.600371 + 0.662127I$	$-7.44445 - 5.45779I$	0
$u = -0.492198 + 1.284080I$ $a = 0.20751 + 1.72707I$ $b = 0.97106 - 1.28854I$	$6.42111 + 12.47940I$	0
$u = -0.492198 - 1.284080I$ $a = 0.20751 - 1.72707I$ $b = 0.97106 + 1.28854I$	$6.42111 - 12.47940I$	0
$u = -0.615203 + 1.260530I$ $a = -0.37637 - 1.68251I$ $b = -1.27509 + 1.33680I$	$-2.09321 + 9.43737I$	0
$u = -0.615203 - 1.260530I$ $a = -0.37637 + 1.68251I$ $b = -1.27509 - 1.33680I$	$-2.09321 - 9.43737I$	0
$u = -0.60014 + 1.29188I$ $a = 0.33986 + 1.65539I$ $b = 1.21338 - 1.39737I$	$2.26103 + 13.52680I$	0
$u = -0.60014 - 1.29188I$ $a = 0.33986 - 1.65539I$ $b = 1.21338 + 1.39737I$	$2.26103 - 13.52680I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.61764 + 1.30754I$ $a = -0.35102 - 1.62737I$ $b = -1.24080 + 1.44894I$	$-0.8748 + 18.5817I$	0
$u = -0.61764 - 1.30754I$ $a = -0.35102 + 1.62737I$ $b = -1.24080 - 1.44894I$	$-0.8748 - 18.5817I$	0
$u = 0.440279$ $a = -0.481278$ $b = 0.451961$	-0.780322	-12.5880
$u = -0.132173 + 0.113061I$ $a = -0.47781 + 3.06580I$ $b = 0.221516 + 0.422164I$	$-0.50223 - 1.35791I$	$-4.98318 + 4.28434I$
$u = -0.132173 - 0.113061I$ $a = -0.47781 - 3.06580I$ $b = 0.221516 - 0.422164I$	$-0.50223 + 1.35791I$	$-4.98318 - 4.28434I$

II. $\boldsymbol{I_2^u = \langle 1.55 \times 10^{94} u^{69} + 1.52 \times 10^{95} u^{68} + \cdots + 1.08 \times 10^{94} b + 7.19 \times 10^{93},\ -1.17 \times 10^{94} u^{69} - 1.27 \times 10^{95} u^{68} + \cdots + 1.08 \times 10^{94} a - 8.60 \times 10^{94},\ u^{70} + 11u^{69} + \cdots + 16u + 1 \rangle}$

(i) Arc colorings

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

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 1.08082u^{69} + 11.7362u^{68} + \cdots + 184.359u + 7.97770 \\ -1.44084u^{69} - 14.1336u^{68} + \cdots - 20.0415u - 0.666475 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} u^{69} + 11u^{68} + \cdots + 192u + 16 \\ -3.20315u^{69} - 32.5737u^{68} + \cdots - 83.3945u - 5.63546 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.360027u^{69} - 2.39747u^{68} + \cdots + 164.318u + 7.31122 \\ -1.44084u^{69} - 14.1336u^{68} + \cdots - 20.0415u - 0.666475 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 5.63546u^{69} + 58.7869u^{68} + \cdots + 224.368u + 7.77279 \\ 2.66095u^{69} + 26.7961u^{68} + \cdots + 45.6150u + 4.20315 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1.64927u^{69} + 17.2776u^{68} + \cdots + 79.4458u + 5.23781 \\ 0.564864u^{69} + 5.72230u^{68} + \cdots + 3.88670u + 0.373194 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.216460u^{69} - 0.984352u^{68} + \cdots + 187.162u + 7.45450 \\ -0.144073u^{69} - 1.84384u^{68} + \cdots - 21.7810u - 0.688465 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 1.51593u^{69} + 16.2137u^{68} + \cdots + 203.870u + 9.30832 \\ 0.761879u^{69} + 7.92472u^{68} + \cdots + 3.97357u + 0.972847 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.132976u^{69} - 0.100144u^{68} + \cdots + 61.5717u - 5.48447 \\ -0.306015u^{69} - 3.25379u^{68} + \cdots + 8.43607u + 1.65974 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -17.4050u^{69} - 175.428u^{68} + \cdots - 209.459u - 22.1259$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{35}+19u^{34}+\cdots-2u-1)^2$
c_2, c_6	$(u^{35}-u^{34}+\cdots-2u+1)^2$
c_3, c_7	$(u^{35}+u^{34}+\cdots+10u+1)^2$
c_4, c_5	$u^{70}-3u^{69}+\cdots+116244u+29257$
c_8, c_9, c_{11} c_{12}	$u^{70}-11u^{69}+\cdots-16u+1$
c_{10}	$(u^{35}-u^{34}+\cdots+2u-1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{35} - 5y^{34} + \cdots + 2y - 1)^2$
c_2, c_6	$(y^{35} + 19y^{34} + \cdots - 2y - 1)^2$
c_3, c_7	$(y^{35} - 29y^{34} + \cdots - 50y - 1)^2$
c_4, c_5	$y^{70} + 27y^{69} + \cdots + 28203718484y + 855972049$
c_8, c_9, c_{11} c_{12}	$y^{70} + 43y^{69} + \cdots + 128y + 1$
c_{10}	$(y^{35} + 11y^{34} + \cdots - 2y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.362102 + 0.951729I$ $a = -0.100504 - 1.012000I$ $b = -1.45453 + 0.12725I$	$-5.23403 + 6.46046I$	0
$u = -0.362102 - 0.951729I$ $a = -0.100504 + 1.012000I$ $b = -1.45453 - 0.12725I$	$-5.23403 - 6.46046I$	0
$u = -0.971172 + 0.001234I$ $a = 0.0134351 + 0.0212814I$ $b = 0.686282 - 0.949474I$	$2.47115 + 7.33485I$	0
$u = -0.971172 - 0.001234I$ $a = 0.0134351 - 0.0212814I$ $b = 0.686282 + 0.949474I$	$2.47115 - 7.33485I$	0
$u = 0.016391 + 1.047640I$ $a = -0.02718 + 1.43210I$ $b = 0.660206 - 0.876545I$	$1.67002 + 2.07827I$	0
$u = 0.016391 - 1.047640I$ $a = -0.02718 - 1.43210I$ $b = 0.660206 + 0.876545I$	$1.67002 - 2.07827I$	0
$u = 0.231464 + 1.027880I$ $a = -1.95974 + 1.25976I$ $b = 2.01738 - 2.24983I$	$-1.83551 + 4.24996I$	0
$u = 0.231464 - 1.027880I$ $a = -1.95974 - 1.25976I$ $b = 2.01738 + 2.24983I$	$-1.83551 - 4.24996I$	0
$u = 0.171370 + 1.043120I$ $a = 1.97007 - 1.59447I$ $b = -2.10116 + 2.39246I$	1.48735	0
$u = 0.171370 - 1.043120I$ $a = 1.97007 + 1.59447I$ $b = -2.10116 - 2.39246I$	1.48735	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.330094 + 0.880242I$ $a = 0.185222 + 1.053900I$ $b = 1.304500 - 0.071629I$	$-1.97019 + 1.67857I$	0
$u = -0.330094 - 0.880242I$ $a = 0.185222 - 1.053900I$ $b = 1.304500 + 0.071629I$	$-1.97019 - 1.67857I$	0
$u = -0.428006 + 0.831185I$ $a = -0.240025 - 0.928202I$ $b = -1.365590 - 0.121653I$	$-5.91946 - 2.50696I$	0
$u = -0.428006 - 0.831185I$ $a = -0.240025 + 0.928202I$ $b = -1.365590 + 0.121653I$	$-5.91946 + 2.50696I$	0
$u = 0.001993 + 1.099100I$ $a = 0.16754 - 2.73997I$ $b = -0.54348 + 2.96665I$	$2.90212 - 1.21814I$	0
$u = 0.001993 - 1.099100I$ $a = 0.16754 + 2.73997I$ $b = -0.54348 - 2.96665I$	$2.90212 + 1.21814I$	0
$u = 0.455946 + 1.002640I$ $a = -0.226037 + 1.393280I$ $b = -0.359584 - 0.449294I$	$-1.36125 - 2.79178I$	0
$u = 0.455946 - 1.002640I$ $a = -0.226037 - 1.393280I$ $b = -0.359584 + 0.449294I$	$-1.36125 + 2.79178I$	0
$u = -1.077150 + 0.256650I$ $a = -0.073618 - 0.180904I$ $b = -0.93877 - 1.13745I$	$-5.25248 - 3.42594I$	0
$u = -1.077150 - 0.256650I$ $a = -0.073618 + 0.180904I$ $b = -0.93877 + 1.13745I$	$-5.25248 + 3.42594I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.094680 + 0.191898I$ $a = 0.045501 + 0.148806I$ $b = 0.85647 + 1.14457I$	$-1.19431 - 7.52211I$	0
$u = -1.094680 - 0.191898I$ $a = 0.045501 - 0.148806I$ $b = 0.85647 - 1.14457I$	$-1.19431 + 7.52211I$	0
$u = 0.189786 + 1.097990I$ $a = -1.64670 + 1.49396I$ $b = 1.95456 - 2.37976I$	$-1.83551 - 4.24996I$	0
$u = 0.189786 - 1.097990I$ $a = -1.64670 - 1.49396I$ $b = 1.95456 + 2.37976I$	$-1.83551 + 4.24996I$	0
$u = 0.004361 + 0.856181I$ $a = 3.11503 - 0.27313I$ $b = -2.63446 + 0.56745I$	$2.90212 + 1.21814I$	0
$u = 0.004361 - 0.856181I$ $a = 3.11503 + 0.27313I$ $b = -2.63446 - 0.56745I$	$2.90212 - 1.21814I$	0
$u = -0.702120 + 0.906516I$ $a = -0.796718 - 0.252448I$ $b = 0.222896 + 0.142326I$	$1.01725 - 1.14078I$	0
$u = -0.702120 - 0.906516I$ $a = -0.796718 + 0.252448I$ $b = 0.222896 - 0.142326I$	$1.01725 + 1.14078I$	0
$u = -1.142550 + 0.196557I$ $a = -0.022298 - 0.165856I$ $b = -0.84945 - 1.20442I$	$-4.37931 - 12.37660I$	0
$u = -1.142550 - 0.196557I$ $a = -0.022298 + 0.165856I$ $b = -0.84945 + 1.20442I$	$-4.37931 + 12.37660I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.835497 + 0.076887I$ $a = -0.014110 - 0.190842I$ $b = -0.675470 + 0.801354I$	$3.33212 + 3.00440I$	0
$u = -0.835497 - 0.076887I$ $a = -0.014110 + 0.190842I$ $b = -0.675470 - 0.801354I$	$3.33212 - 3.00440I$	0
$u = 0.183998 + 1.157830I$ $a = 0.002222 - 1.388870I$ $b = -0.018988 + 1.000380I$	$2.91461 - 1.90476I$	0
$u = 0.183998 - 1.157830I$ $a = 0.002222 + 1.388870I$ $b = -0.018988 - 1.000380I$	$2.91461 + 1.90476I$	0
$u = -0.658098 + 1.076360I$ $a = 0.777615 + 0.453828I$ $b = -0.105220 - 0.453813I$	$4.55305 + 2.51214I$	0
$u = -0.658098 - 1.076360I$ $a = 0.777615 - 0.453828I$ $b = -0.105220 + 0.453813I$	$4.55305 - 2.51214I$	0
$u = -0.671200 + 0.272239I$ $a = 0.507154 + 0.106964I$ $b = 0.964036 + 0.723303I$	$-1.36125 - 2.79178I$	$-13.43445 + 0.I$
$u = -0.671200 - 0.272239I$ $a = 0.507154 - 0.106964I$ $b = 0.964036 - 0.723303I$	$-1.36125 + 2.79178I$	$-13.43445 + 0.I$
$u = 0.528808 + 0.431959I$ $a = 0.83458 - 1.89090I$ $b = 0.114478 - 0.558335I$	$-5.91946 - 2.50696I$	$-13.26110 + 2.94934I$
$u = 0.528808 - 0.431959I$ $a = 0.83458 + 1.89090I$ $b = 0.114478 + 0.558335I$	$-5.91946 + 2.50696I$	$-13.26110 - 2.94934I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.752093 + 1.088900I$ $a = -0.689822 - 0.417214I$ $b = -0.049160 + 0.362378I$	$1.63653 + 7.02473I$	0
$u = -0.752093 - 1.088900I$ $a = -0.689822 + 0.417214I$ $b = -0.049160 - 0.362378I$	$1.63653 - 7.02473I$	0
$u = 0.378678 + 1.271580I$ $a = 0.082986 - 1.247180I$ $b = 0.437616 + 0.986037I$	$3.33212 - 3.00440I$	0
$u = 0.378678 - 1.271580I$ $a = 0.082986 + 1.247180I$ $b = 0.437616 - 0.986037I$	$3.33212 + 3.00440I$	0
$u = -0.532938 + 1.273710I$ $a = 0.700808 + 0.699873I$ $b = -0.025749 - 0.896753I$	$6.72846 + 2.09817I$	0
$u = -0.532938 - 1.273710I$ $a = 0.700808 - 0.699873I$ $b = -0.025749 + 0.896753I$	$6.72846 - 2.09817I$	0
$u = 0.484898 + 1.307290I$ $a = -0.136066 + 1.194180I$ $b = -0.639871 - 0.963047I$	$2.47115 - 7.33485I$	0
$u = 0.484898 - 1.307290I$ $a = -0.136066 - 1.194180I$ $b = -0.639871 + 0.963047I$	$2.47115 + 7.33485I$	0
$u = 0.532064 + 0.260484I$ $a = 1.27588 - 1.99852I$ $b = -0.006289 - 0.802486I$	$-5.23403 + 6.46046I$	$-12.19651 - 3.55460I$
$u = 0.532064 - 0.260484I$ $a = 1.27588 + 1.99852I$ $b = -0.006289 + 0.802486I$	$-5.23403 - 6.46046I$	$-12.19651 + 3.55460I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.691259 + 1.229650I$ $a = \quad 0.270821 - 1.165160I$ $b = \quad 0.942516 + 0.685241I$	$-5.25248 - 3.42594I$	0
$u = \quad 0.691259 - 1.229650I$ $a = \quad 0.270821 + 1.165160I$ $b = \quad 0.942516 - 0.685241I$	$-5.25248 + 3.42594I$	0
$u = -0.44836 + 1.34906I$ $a = -0.642320 - 0.809577I$ $b = \quad 0.022505 + 1.096370I$	$6.72846 - 2.09817I$	0
$u = -0.44836 - 1.34906I$ $a = -0.642320 + 0.809577I$ $b = \quad 0.022505 - 1.096370I$	$6.72846 + 2.09817I$	0
$u = \quad 0.66211 + 1.27675I$ $a = -0.239531 + 1.153130I$ $b = -0.923043 - 0.788287I$	$-1.19431 - 7.52211I$	0
$u = \quad 0.66211 - 1.27675I$ $a = -0.239531 - 1.153130I$ $b = -0.923043 + 0.788287I$	$-1.19431 + 7.52211I$	0
$u = \quad 0.450658 + 0.322883I$ $a = -1.02214 + 2.21324I$ $b = \quad 0.070264 + 0.659054I$	$-1.97019 + 1.67857I$	$-9.17734 - 0.36674I$
$u = \quad 0.450658 - 0.322883I$ $a = -1.02214 - 2.21324I$ $b = \quad 0.070264 - 0.659054I$	$-1.97019 - 1.67857I$	$-9.17734 + 0.36674I$
$u = -0.12997 + 1.44563I$ $a = \quad 0.393709 + 1.099040I$ $b = -0.12084 - 1.47133I$	$1.01725 + 1.14078I$	0
$u = -0.12997 - 1.44563I$ $a = \quad 0.393709 - 1.099040I$ $b = -0.12084 + 1.47133I$	$1.01725 - 1.14078I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.26268 + 1.43599I$ $a = -0.502802 - 0.992024I$ $b = 0.069674 + 1.379420I$	$4.55305 - 2.51214I$	0
$u = -0.26268 - 1.43599I$ $a = -0.502802 + 0.992024I$ $b = 0.069674 - 1.379420I$	$4.55305 + 2.51214I$	0
$u = 0.69145 + 1.30334I$ $a = 0.244252 - 1.130360I$ $b = 0.992491 + 0.815615I$	$-4.37931 - 12.37660I$	0
$u = 0.69145 - 1.30334I$ $a = 0.244252 + 1.130360I$ $b = 0.992491 - 0.815615I$	$-4.37931 + 12.37660I$	0
$u = -0.479440 + 0.166521I$ $a = 0.003513 - 1.058800I$ $b = -0.776200 + 0.600848I$	$2.91461 + 1.90476I$	$-4.38240 - 3.26312I$
$u = -0.479440 - 0.166521I$ $a = 0.003513 + 1.058800I$ $b = -0.776200 - 0.600848I$	$2.91461 - 1.90476I$	$-4.38240 + 3.26312I$
$u = -0.25835 + 1.51265I$ $a = 0.433847 + 0.954857I$ $b = -0.01097 - 1.43398I$	$1.63653 - 7.02473I$	0
$u = -0.25835 - 1.51265I$ $a = 0.433847 - 0.954857I$ $b = -0.01097 + 1.43398I$	$1.63653 + 7.02473I$	0
$u = -0.0387239 + 0.1019520I$ $a = -4.68457 + 7.81727I$ $b = 0.782958 - 0.728346I$	$1.67002 - 2.07827I$	$-8.18960 + 3.40333I$
$u = -0.0387239 - 0.1019520I$ $a = -4.68457 - 7.81727I$ $b = 0.782958 + 0.728346I$	$1.67002 + 2.07827I$	$-8.18960 - 3.40333I$

III. $\boldsymbol{I_3^u = \langle b - a,\ 32a^5 - 16a^4 - 16a^3 + 4a^2 + 2a + 1,\ u - 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} a \\ a \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 2a \\ a \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -4a^2 \\ -2a^2 - 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -8a^3 + 2a \\ -4a^3 - a \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 2a \\ 3a \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -16a^4 - 8a^3 + 4a^2 + 4a + 1 \\ -24a^4 - 4a^3 + 6a^2 + 2a + \frac{3}{2} \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 64a^4 - 32a^3 - 15a^2 + 8a - 14$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^5 - 3u^4 + 4u^3 - u^2 - u + 1$
c_2	$u^5 - u^4 + 2u^3 - u^2 + u - 1$
c_3	$u^5 + u^4 - 2u^3 - u^2 + u - 1$
c_4	$32(32u^5 + 16u^4 - 16u^3 - 4u^2 + 2u - 1)$
c_5	$32(32u^5 - 16u^4 - 16u^3 + 4u^2 + 2u + 1)$
c_6	$u^5 + u^4 + 2u^3 + u^2 + u + 1$
c_7	$u^5 - u^4 - 2u^3 + u^2 + u + 1$
c_8, c_9	$(u-1)^5$
c_{10}	u^5
c_{11}, c_{12}	$(u+1)^5$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^5 - y^4 + 8y^3 - 3y^2 + 3y - 1$
c_2, c_6	$y^5 + 3y^4 + 4y^3 + y^2 - y - 1$
c_3, c_7	$y^5 - 5y^4 + 8y^3 - 3y^2 - y - 1$
c_4, c_5	$1024(1024y^5 - 1280y^4 + 512y^3 - 48y^2 - 4y - 1)$
c_8, c_9, c_{11} c_{12}	$(y-1)^5$
c_{10}	y^5

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0.709392 + 0.109583I$ $b = 0.709392 + 0.109583I$	$-7.51750 - 4.40083I$	$-12.40273 + 3.06842I$
$u = 1.00000$ $a = 0.709392 - 0.109583I$ $b = 0.709392 - 0.109583I$	$-7.51750 + 4.40083I$	$-12.40273 - 3.06842I$
$u = 1.00000$ $a = -0.608868$ $b = -0.608868$	-4.04602	-8.41300
$u = 1.00000$ $a = -0.154958 + 0.274955I$ $b = -0.154958 + 0.274955I$	$-1.97403 + 1.53058I$	$-15.7658 + 4.0719I$
$u = 1.00000$ $a = -0.154958 - 0.274955I$ $b = -0.154958 - 0.274955I$	$-1.97403 - 1.53058I$	$-15.7658 - 4.0719I$

IV. $I_4^u = \langle au + b + a - u + 1,\ a^2 - 2au - a + u,\ u^2 + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4a + 4u$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = 0.500000 + 0.133975I$ $b = -1.36603 + 0.36603I$	$3.28987 - 2.02988I$	$-2.00000 + 3.46410I$
$u = 1.000000I$ $a = 0.50000 + 1.86603I$ $b = 0.36603 - 1.36603I$	$3.28987 + 2.02988I$	$-2.00000 - 3.46410I$
$u = -1.000000I$ $a = 0.500000 - 0.133975I$ $b = -1.36603 - 0.36603I$	$3.28987 + 2.02988I$	$-2.00000 - 3.46410I$
$u = -1.000000I$ $a = 0.50000 - 1.86603I$ $b = 0.36603 + 1.36603I$	$3.28987 - 2.02988I$	$-2.00000 + 3.46410I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)^2(u^5-3u^4+4u^3-u^2-u+1)$ $\cdot((u^{35}+19u^{34}+\cdots-2u-1)^2)(u^{45}+24u^{44}+\cdots+145u-16)$
c_2	$((u^2+u+1)^2)(u^5-u^4+\cdots+u-1)(u^{35}-u^{34}+\cdots-2u+1)^2$ $\cdot(u^{45}-2u^{44}+\cdots+5u+4)$
c_3	$((u^2-u+1)^2)(u^5+u^4+\cdots+u-1)(u^{35}+u^{34}+\cdots+10u+1)^2$ $\cdot(u^{45}+2u^{44}+\cdots+621u+292)$
c_4	$1024(u^4-2u^3+\cdots-4u+4)(32u^5+16u^4+\cdots+2u-1)$ $\cdot(32u^{45}-16u^{44}+\cdots+12u+4)(u^{70}-3u^{69}+\cdots+116244u+29257)$
c_5	$1024(u^4+2u^3+\cdots+4u+4)(32u^5-16u^4+\cdots+2u+1)$ $\cdot(32u^{45}-16u^{44}+\cdots+12u+4)(u^{70}-3u^{69}+\cdots+116244u+29257)$
c_6	$((u^2-u+1)^2)(u^5+u^4+\cdots+u+1)(u^{35}-u^{34}+\cdots-2u+1)^2$ $\cdot(u^{45}-2u^{44}+\cdots+5u+4)$
c_7	$((u^2+u+1)^2)(u^5-u^4+\cdots+u+1)(u^{35}+u^{34}+\cdots+10u+1)^2$ $\cdot(u^{45}+2u^{44}+\cdots+621u+292)$
c_8, c_9	$((u-1)^5)(u^2+1)^2(u^{45}+5u^{44}+\cdots-4u+1)$ $\cdot(u^{70}-11u^{69}+\cdots-16u+1)$
c_{10}	$u^5(u^4-u^2+1)(u^{35}-u^{34}+\cdots+2u-1)^2$ $\cdot(u^{45}+3u^{44}+\cdots+5632u+2048)$
c_{11}, c_{12}	$((u+1)^5)(u^2+1)^2(u^{45}+5u^{44}+\cdots-4u+1)$ $\cdot(u^{70}-11u^{69}+\cdots-16u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^2+y+1)^2(y^5-y^4+8y^3-3y^2+3y-1)$ $\cdot((y^{35}-5y^{34}+\cdots+2y-1)^2)(y^{45}-4y^{44}+\cdots+44993y-256)$
c_2, c_6	$(y^2+y+1)^2(y^5+3y^4+4y^3+y^2-y-1)$ $\cdot((y^{35}+19y^{34}+\cdots-2y-1)^2)(y^{45}+24y^{44}+\cdots+145y-16)$
c_3, c_7	$(y^2+y+1)^2(y^5-5y^4+8y^3-3y^2-y-1)$ $\cdot(y^{35}-29y^{34}+\cdots-50y-1)^2$ $\cdot(y^{45}-32y^{44}+\cdots+1265729y-85264)$
c_4, c_5	$1048576(y^4-4y^2+16)(1024y^5-1280y^4+\cdots-4y-1)$ $\cdot(1024y^{45}-5376y^{44}+\cdots+320y-16)$ $\cdot(y^{70}+27y^{69}+\cdots+28203718484y+855972049)$
c_8, c_9, c_{11} c_{12}	$((y-1)^5)(y+1)^4(y^{45}+17y^{44}+\cdots-1030y^2-1)$ $\cdot(y^{70}+43y^{69}+\cdots+128y+1)$
c_{10}	$y^5(y^2-y+1)^2(y^{35}+11y^{34}+\cdots-2y-1)^2$ $\cdot(y^{45}+9y^{44}+\cdots-83623936y-4194304)$