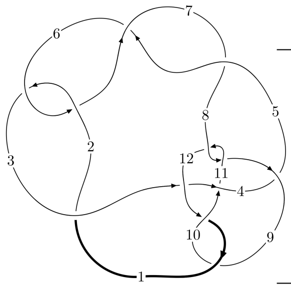
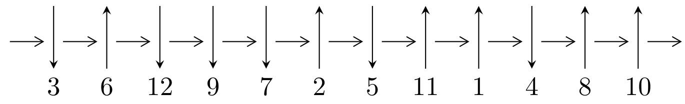
$12a_{0491}$ ($K12a_{0491}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & 36464738633053u^{37} + 59977391192807u^{36} + \cdots + 923900646795586b + 268221858684342, \\
& 152917149567933u^{37} + 224240062977026u^{36} + \cdots + 184780129359172a + 822275190521781, \\
& u^{38} + 2u^{37} + \cdots + 11u + 4\rangle \\
I_2^u = \langle & -264u^{28}a + 1341u^{28} + \cdots - 954a + 889,\ -4u^{28}a - 11u^{28} + \cdots + 2a + 10,\ u^{29} + u^{28} + \cdots + u - 1\rangle \\
I_3^u = \langle & u^2 + 2b,\ -u^2 + 2a + 2u - 1,\ u^4 - u^3 + u^2 + 1\rangle \\
I_4^u = \langle & 2au + 3b + a - u + 1,\ a^2 + 2a - 2,\ u^2 + u + 1\rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 104 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. $I_1^u =$
$\langle 3.65\times10^{13}u^{37}+6.00\times10^{13}u^{36}+\cdots+9.24\times10^{13}b+2.68\times10^{14},\ 1.53\times10^{14}u^{37}+2.24\times10^{14}u^{36}+\cdots+1.85\times10^{14}a+8.22\times10^{14},\ u^{38}+2u^{37}+\cdots+11u+4\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}u\\u^3+u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^2+1\\u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}u^3\\u^5+u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^5+u\\u^7+u^5+2u^3+u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-0.827563u^{37}-1.21355u^{36}+\cdots-4.66685u-4.45002\\-0.394682u^{37}-0.649176u^{36}+\cdots-3.90259u-2.90315\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-0.593828u^{37}-0.803497u^{36}+\cdots-3.09638u-2.63169\\-0.431051u^{37}-0.749146u^{36}+\cdots-4.65100u-2.78242\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-0.478729u^{37}-0.704715u^{36}+\cdots-1.21047u-1.62604\\-0.261516u^{37}-0.420727u^{36}+\cdots-2.23130u-2.01168\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-0.0607175u^{37}-0.142568u^{36}+\cdots-0.459914u+0.0392307\\0.0514098u^{37}+0.0422745u^{36}+\cdots+0.976418u+0.348449\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}-0.657135u^{37}-0.934060u^{36}+\cdots-3.63692u-3.16531\\-0.491481u^{37}-0.777655u^{36}+\cdots-4.82548u-3.91534\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{140731106135951}{46195032339793}u^{37}+\frac{664007827422593}{184780129359172}u^{36}+\cdots+\frac{520000519209215}{46195032339793}u+\frac{686592782892934}{46195032339793}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_7	$u^{38} + 10u^{37} + \cdots + 31u + 16$
c_2, c_6	$u^{38} - 2u^{37} + \cdots - 11u + 4$
c_3, c_4	$16(16u^{38} - 24u^{37} + \cdots + 8u + 4)$
c_8, c_9, c_{11} c_{12}	$u^{38} - 4u^{37} + \cdots + 26u^2 + 1$
c_{10}	$u^{38} + 3u^{37} + \cdots + 2944u + 512$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$y^{38} + 38y^{37} + \cdots - 865y + 256$
c_2, c_6	$y^{38} + 10y^{37} + \cdots + 31y + 16$
c_3, c_4	$256(256y^{38} + 1856y^{37} + \cdots + 368y + 16)$
c_8, c_9, c_{11} c_{12}	$y^{38} + 14y^{37} + \cdots + 52y + 1$
c_{10}	$y^{38} - 11y^{37} + \cdots - 2867200y + 262144$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.816967 + 0.516691I$ $a = 0.66711 + 1.54872I$ $b = 0.259357 + 0.951073I$	$-2.09912 - 5.36511I$	$-0.24379 + 7.67654I$
$u = -0.816967 - 0.516691I$ $a = 0.66711 - 1.54872I$ $b = 0.259357 - 0.951073I$	$-2.09912 + 5.36511I$	$-0.24379 - 7.67654I$
$u = 0.088344 + 1.071360I$ $a = -0.786792 + 0.722196I$ $b = -0.06504 - 1.79265I$	$-8.07886 - 6.38919I$	$-7.94198 + 5.19165I$
$u = 0.088344 - 1.071360I$ $a = -0.786792 - 0.722196I$ $b = -0.06504 + 1.79265I$	$-8.07886 + 6.38919I$	$-7.94198 - 5.19165I$
$u = -0.267518 + 1.051470I$ $a = -1.003380 - 0.653197I$ $b = -0.72082 + 1.68906I$	$-2.74814 - 4.44465I$	$-2.46238 + 9.81067I$
$u = -0.267518 - 1.051470I$ $a = -1.003380 + 0.653197I$ $b = -0.72082 - 1.68906I$	$-2.74814 + 4.44465I$	$-2.46238 - 9.81067I$
$u = -0.430113 + 1.014270I$ $a = 1.43565 + 0.14917I$ $b = 0.515460 - 1.274350I$	$-1.89132 - 2.01335I$	$2.64980 + 1.56754I$
$u = -0.430113 - 1.014270I$ $a = 1.43565 - 0.14917I$ $b = 0.515460 + 1.274350I$	$-1.89132 + 2.01335I$	$2.64980 - 1.56754I$
$u = 0.414376 + 1.035890I$ $a = 1.79208 - 0.57007I$ $b = 0.67343 + 2.00434I$	$-6.1118 + 12.9461I$	$-4.95394 - 9.99096I$
$u = 0.414376 - 1.035890I$ $a = 1.79208 + 0.57007I$ $b = 0.67343 - 2.00434I$	$-6.1118 - 12.9461I$	$-4.95394 + 9.99096I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.347501 + 0.797377I$ $a = 1.034560 + 0.900604I$ $b = 0.050426 - 0.214066I$	$1.31226 + 1.74609I$	$-8.3147 - 14.9516I$
$u = 0.347501 - 0.797377I$ $a = 1.034560 - 0.900604I$ $b = 0.050426 + 0.214066I$	$1.31226 - 1.74609I$	$-8.3147 + 14.9516I$
$u = 0.876268 + 0.787294I$ $a = 1.44677 - 1.98187I$ $b = 1.53330 - 1.23829I$	$4.92901 - 3.34858I$	$2.00441 + 3.76085I$
$u = 0.876268 - 0.787294I$ $a = 1.44677 + 1.98187I$ $b = 1.53330 + 1.23829I$	$4.92901 + 3.34858I$	$2.00441 - 3.76085I$
$u = 0.766483 + 0.236896I$ $a = -0.17616 + 2.12144I$ $b = -0.52364 + 1.60414I$	$-3.49461 - 8.73893I$	$-0.20669 + 6.08042I$
$u = 0.766483 - 0.236896I$ $a = -0.17616 - 2.12144I$ $b = -0.52364 - 1.60414I$	$-3.49461 + 8.73893I$	$-0.20669 - 6.08042I$
$u = -0.619277 + 1.044970I$ $a = -1.89941 + 0.04498I$ $b = -0.825361 + 1.032990I$	$-3.75027 + 0.04407I$	$-3.65209 - 4.05484I$
$u = -0.619277 - 1.044970I$ $a = -1.89941 - 0.04498I$ $b = -0.825361 - 1.032990I$	$-3.75027 - 0.04407I$	$-3.65209 + 4.05484I$
$u = -0.854926 + 0.879047I$ $a = -0.550203 + 0.024165I$ $b = 0.236741 + 0.729329I$	$8.59748 - 1.92899I$	$2.35323 - 2.21681I$
$u = -0.854926 - 0.879047I$ $a = -0.550203 - 0.024165I$ $b = 0.236741 - 0.729329I$	$8.59748 + 1.92899I$	$2.35323 + 2.21681I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.912785 + 0.820153I$ $a = -0.94587 - 2.31254I$ $b = -1.27653 - 1.84714I$	$2.71412 + 11.17750I$	$0.33746 - 5.40278I$
$u = -0.912785 - 0.820153I$ $a = -0.94587 + 2.31254I$ $b = -1.27653 + 1.84714I$	$2.71412 - 11.17750I$	$0.33746 + 5.40278I$
$u = -0.833449 + 0.933812I$ $a = -0.199843 - 0.181143I$ $b = -0.117944 + 0.737215I$	$8.42458 - 4.34753I$	$1.37292 + 7.42145I$
$u = -0.833449 - 0.933812I$ $a = -0.199843 + 0.181143I$ $b = -0.117944 - 0.737215I$	$8.42458 + 4.34753I$	$1.37292 - 7.42145I$
$u = 0.797919 + 0.999570I$ $a = -2.81176 + 0.15661I$ $b = -1.61632 - 1.43028I$	$4.26696 + 9.56924I$	$0.36726 - 8.73949I$
$u = 0.797919 - 0.999570I$ $a = -2.81176 - 0.15661I$ $b = -1.61632 + 1.43028I$	$4.26696 - 9.56924I$	$0.36726 + 8.73949I$
$u = 0.885259 + 0.924982I$ $a = -0.402714 + 0.630130I$ $b = -0.426798 + 0.629711I$	$7.35435 + 1.80474I$	$1.40236 + 2.23426I$
$u = 0.885259 - 0.924982I$ $a = -0.402714 - 0.630130I$ $b = -0.426798 - 0.629711I$	$7.35435 - 1.80474I$	$1.40236 - 2.23426I$
$u = -0.349555 + 0.626590I$ $a = 0.198914 - 0.644452I$ $b = -0.336980 - 0.349923I$	$-0.163419 - 1.129300I$	$-2.57883 + 5.23119I$
$u = -0.349555 - 0.626590I$ $a = 0.198914 + 0.644452I$ $b = -0.336980 + 0.349923I$	$-0.163419 + 1.129300I$	$-2.57883 - 5.23119I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.890869 + 0.923910I$ $a = 1.069640 + 0.049549I$ $b = 0.354749 + 0.558656I$	$7.36330 + 4.74827I$	$1.63906 - 7.30375I$
$u = 0.890869 - 0.923910I$ $a = 1.069640 - 0.049549I$ $b = 0.354749 - 0.558656I$	$7.36330 - 4.74827I$	$1.63906 + 7.30375I$
$u = -0.831961 + 0.999886I$ $a = 3.00130 - 0.50242I$ $b = 1.30372 - 1.97922I$	$2.1422 - 17.6191I$	$-0.56156 + 9.93310I$
$u = -0.831961 - 0.999886I$ $a = 3.00130 + 0.50242I$ $b = 1.30372 + 1.97922I$	$2.1422 + 17.6191I$	$-0.56156 - 9.93310I$
$u = 0.416803 + 0.548680I$ $a = -0.185246 + 1.297020I$ $b = 0.360369 - 0.039227I$	$2.08077 + 1.28136I$	$8.26270 + 1.93719I$
$u = 0.416803 - 0.548680I$ $a = -0.185246 - 1.297020I$ $b = 0.360369 + 0.039227I$	$2.08077 - 1.28136I$	$8.26270 - 1.93719I$
$u = -0.567270 + 0.025000I$ $a = 0.44037 - 1.76748I$ $b = 0.371874 - 0.911456I$	$0.53666 - 1.46350I$	$5.15173 + 4.88406I$
$u = -0.567270 - 0.025000I$ $a = 0.44037 + 1.76748I$ $b = 0.371874 + 0.911456I$	$0.53666 + 1.46350I$	$5.15173 - 4.88406I$

II. $I_2^u = \langle -264u^{28}a + 1341u^{28} + \cdots - 954a + 889,\ -4u^{28}a - 11u^{28} + \cdots + 2a + 10,\ u^{29} + u^{28} + \cdots + u - 1 \rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^3 \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u^5 + u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a \\ 0.228968au^{28} - 1.16305u^{28} + \cdots + 0.827407a - 0.771032 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.111015au^{28} + 0.654814u^{28} + \cdots + 0.326106a + 0.888985 \\ 0.402428au^{28} - 1.49870u^{28} + \cdots + 0.817866a - 0.597572 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0.990460au^{28} + 1.17346u^{28} + \cdots + 0.715525a - 3.00954 \\ -0.508239au^{28} - 1.48656u^{28} + \cdots + 0.117953a - 1.50824 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.175195au^{28} - 0.549003u^{28} + \cdots + 1.86036a + 11.1752 \\ 1.55594au^{28} + 4.61925u^{28} + \cdots - 0.695577a + 0.555941 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.990460au^{28} + 1.17346u^{28} + \cdots + 0.715525a - 4.00954 \\ -0.172593au^{28} - 1.77103u^{28} + \cdots - 0.0555074a - 2.17259 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^{28} - 12u^{26} + 4u^{25} - 48u^{24} + 12u^{23} - 100u^{22} + 44u^{21} - 208u^{20} + 92u^{19} - 312u^{18} + 172u^{17} - 424u^{16} + 252u^{15} - 456u^{14} + 296u^{13} - 432u^{12} + 288u^{11} - 328u^{10} + 216u^9 - 216u^8 + 128u^7 - 120u^6 + 56u^5 - 48u^4 + 32u^3 - 16u^2 + 12u - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_7	$(u^{29} + 7u^{28} + \cdots - u - 1)^2$
c_2, c_6	$(u^{29} - u^{28} + \cdots + u + 1)^2$
c_3, c_4	$u^{58} + 3u^{57} + \cdots - 2526u + 541$
c_8, c_9, c_{11} c_{12}	$u^{58} + 9u^{57} + \cdots + 4u + 1$
c_{10}	$(u^{29} - u^{28} + \cdots + 3u - 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$(y^{29} + 31y^{28} + \cdots + 15y - 1)^2$
c_2, c_6	$(y^{29} + 7y^{28} + \cdots - y - 1)^2$
c_3, c_4	$y^{58} - 21y^{57} + \cdots - 31273168y + 292681$
c_8, c_9, c_{11} c_{12}	$y^{58} + 35y^{57} + \cdots + 128y + 1$
c_{10}	$(y^{29} - 9y^{28} + \cdots - y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.438147 + 0.901074I$ $a = 0.866777 + 0.306748I$ $b = 0.656173 - 0.646431I$	$-1.65464 - 2.09123I$	$-0.28547 + 3.54352I$
$u = -0.438147 + 0.901074I$ $a = 1.84101 + 0.17982I$ $b = 0.137940 - 1.357250I$	$-1.65464 - 2.09123I$	$-0.28547 + 3.54352I$
$u = -0.438147 - 0.901074I$ $a = 0.866777 - 0.306748I$ $b = 0.656173 + 0.646431I$	$-1.65464 + 2.09123I$	$-0.28547 - 3.54352I$
$u = -0.438147 - 0.901074I$ $a = 1.84101 - 0.17982I$ $b = 0.137940 + 1.357250I$	$-1.65464 + 2.09123I$	$-0.28547 - 3.54352I$
$u = 0.409980 + 0.948974I$ $a = -0.583985 - 0.702562I$ $b = 0.145390 + 0.076058I$	$-2.40330 + 7.55674I$	$-2.27529 - 8.69605I$
$u = 0.409980 + 0.948974I$ $a = -1.79153 + 0.98779I$ $b = -0.53216 - 1.57404I$	$-2.40330 + 7.55674I$	$-2.27529 - 8.69605I$
$u = 0.409980 - 0.948974I$ $a = -0.583985 + 0.702562I$ $b = 0.145390 - 0.076058I$	$-2.40330 - 7.55674I$	$-2.27529 + 8.69605I$
$u = 0.409980 - 0.948974I$ $a = -1.79153 - 0.98779I$ $b = -0.53216 + 1.57404I$	$-2.40330 - 7.55674I$	$-2.27529 + 8.69605I$
$u = 0.273126 + 0.909412I$ $a = 1.11650 - 1.20654I$ $b = -0.23945 + 1.49698I$	$-7.10499 + 2.50065I$	$-9.49416 - 5.21299I$
$u = 0.273126 + 0.909412I$ $a = -1.81954 + 1.31388I$ $b = -0.578605 - 0.951313I$	$-7.10499 + 2.50065I$	$-9.49416 - 5.21299I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.273126 - 0.909412I$ $a = 1.11650 + 1.20654I$ $b = -0.23945 - 1.49698I$	$-7.10499 - 2.50065I$	$-9.49416 + 5.21299I$
$u = 0.273126 - 0.909412I$ $a = -1.81954 - 1.31388I$ $b = -0.578605 + 0.951313I$	$-7.10499 - 2.50065I$	$-9.49416 + 5.21299I$
$u = 0.064282 + 0.911143I$ $a = -0.791876 - 0.089875I$ $b = 0.146627 + 0.566746I$	$-4.28946 - 2.39368I$	$-6.11411 + 2.65936I$
$u = 0.064282 + 0.911143I$ $a = 0.79891 - 1.62494I$ $b = -0.167307 + 1.268310I$	$-4.28946 - 2.39368I$	$-6.11411 + 2.65936I$
$u = 0.064282 - 0.911143I$ $a = -0.791876 + 0.089875I$ $b = 0.146627 - 0.566746I$	$-4.28946 + 2.39368I$	$-6.11411 - 2.65936I$
$u = 0.064282 - 0.911143I$ $a = 0.79891 + 1.62494I$ $b = -0.167307 - 1.268310I$	$-4.28946 + 2.39368I$	$-6.11411 - 2.65936I$
$u = -0.815394 + 0.851135I$ $a = 0.251672 - 1.225170I$ $b = -0.21594 - 1.64229I$	$-0.467923 + 0.042330I$	$-2.03677 - 1.08568I$
$u = -0.815394 + 0.851135I$ $a = 1.94470 + 0.77465I$ $b = 0.879934 - 0.022790I$	$-0.467923 + 0.042330I$	$-2.03677 - 1.08568I$
$u = -0.815394 - 0.851135I$ $a = 0.251672 + 1.225170I$ $b = -0.21594 + 1.64229I$	$-0.467923 - 0.042330I$	$-2.03677 + 1.08568I$
$u = -0.815394 - 0.851135I$ $a = 1.94470 - 0.77465I$ $b = 0.879934 + 0.022790I$	$-0.467923 - 0.042330I$	$-2.03677 + 1.08568I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.886761+0.845005I$ $a=\ \ 0.106105-0.124341I$ $b=-0.449081-0.545099I$	$5.93451+4.97924I$	$2.81712-2.83205I$
$u=-0.886761+0.845005I$ $a=\ \ 0.81426+1.80965I$ $b=\ \ 1.02756+1.59116I$	$5.93451+4.97924I$	$2.81712-2.83205I$
$u=-0.886761-0.845005I$ $a=\ \ 0.106105+0.124341I$ $b=-0.449081+0.545099I$	$5.93451-4.97924I$	$2.81712+2.83205I$
$u=-0.886761-0.845005I$ $a=\ \ 0.81426-1.80965I$ $b=\ \ 1.02756-1.59116I$	$5.93451-4.97924I$	$2.81712+2.83205I$
$u=\ \ 0.829632+0.902432I$ $a=\ \ 1.44505-4.20042I$ $b=\ \ 2.65889-2.68627I$	$2.66705+3.09358I$	$3.95361-2.70964I$
$u=\ \ 0.829632+0.902432I$ $a=-5.01880-0.63860I$ $b=-2.63453-2.74484I$	$2.66705+3.09358I$	$3.95361-2.70964I$
$u=\ \ 0.829632-0.902432I$ $a=\ \ 1.44505+4.20042I$ $b=\ \ 2.65889+2.68627I$	$2.66705-3.09358I$	$3.95361+2.70964I$
$u=\ \ 0.829632-0.902432I$ $a=-5.01880+0.63860I$ $b=-2.63453+2.74484I$	$2.66705-3.09358I$	$3.95361+2.70964I$
$u=-0.796082+0.934420I$ $a=\ \ 1.88242-0.84301I$ $b=\ \ 0.15088-1.74671I$	$-0.72258-6.08103I$	$-2.75508+6.19570I$
$u=-0.796082+0.934420I$ $a=-2.06357-0.52441I$ $b=-1.027530+0.185341I$	$-0.72258-6.08103I$	$-2.75508+6.19570I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.796082 - 0.934420I$ $a = 1.88242 + 0.84301I$ $b = 0.15088 + 1.74671I$	$-0.72258 + 6.08103I$	$-2.75508 - 6.19570I$
$u = -0.796082 - 0.934420I$ $a = -2.06357 + 0.52441I$ $b = -1.027530 - 0.185341I$	$-0.72258 + 6.08103I$	$-2.75508 - 6.19570I$
$u = 0.883056 + 0.860857I$ $a = -0.415604 + 0.501030I$ $b = -0.167930 + 0.016154I$	$6.67034 + 1.00685I$	$4.05949 - 2.19242I$
$u = 0.883056 + 0.860857I$ $a = -0.87318 + 1.88119I$ $b = -1.18293 + 1.38438I$	$6.67034 + 1.00685I$	$4.05949 - 2.19242I$
$u = 0.883056 - 0.860857I$ $a = -0.415604 - 0.501030I$ $b = -0.167930 - 0.016154I$	$6.67034 - 1.00685I$	$4.05949 + 2.19242I$
$u = 0.883056 - 0.860857I$ $a = -0.87318 - 1.88119I$ $b = -1.18293 - 1.38438I$	$6.67034 - 1.00685I$	$4.05949 + 2.19242I$
$u = -0.273342 + 0.693824I$ $a = -3.32819 + 2.07273I$ $b = 1.62368 + 3.27488I$	$-3.62270 - 1.16630I$	$-0.21359 + 5.75923I$
$u = -0.273342 + 0.693824I$ $a = -2.49708 - 5.76954I$ $b = -3.05089 + 1.78246I$	$-3.62270 - 1.16630I$	$-0.21359 + 5.75923I$
$u = -0.273342 - 0.693824I$ $a = -3.32819 - 2.07273I$ $b = 1.62368 - 3.27488I$	$-3.62270 + 1.16630I$	$-0.21359 - 5.75923I$
$u = -0.273342 - 0.693824I$ $a = -2.49708 + 5.76954I$ $b = -3.05089 - 1.78246I$	$-3.62270 + 1.16630I$	$-0.21359 - 5.75923I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.610942+0.390932I$ $a=\ \ 0.147063-1.231320I$ $b=\ \ 0.165975-0.936149I$	$-0.05631-1.79478I$	$3.97960+2.96423I$
$u=-0.610942+0.390932I$ $a=-0.322053-1.323370I$ $b=-0.678870-0.634625I$	$-0.05631-1.79478I$	$3.97960+2.96423I$
$u=-0.610942-0.390932I$ $a=\ \ 0.147063+1.231320I$ $b=\ \ 0.165975+0.936149I$	$-0.05631+1.79478I$	$3.97960-2.96423I$
$u=-0.610942-0.390932I$ $a=-0.322053+1.323370I$ $b=-0.678870+0.634625I$	$-0.05631+1.79478I$	$3.97960-2.96423I$
$u=\ \ 0.840392+0.961339I$ $a=\ \ 0.496454+0.102211I$ $b=\ \ 0.314511-0.035083I$	$6.35169+5.37662I$	$3.47961-2.73445I$
$u=\ \ 0.840392+0.961339I$ $a=\ \ 2.52374+0.40857I$ $b=\ \ 1.13451+1.54944I$	$6.35169+5.37662I$	$3.47961-2.73445I$
$u=\ \ 0.840392-0.961339I$ $a=\ \ 0.496454-0.102211I$ $b=\ \ 0.314511+0.035083I$	$6.35169-5.37662I$	$3.47961+2.73445I$
$u=\ \ 0.840392-0.961339I$ $a=\ \ 2.52374-0.40857I$ $b=\ \ 1.13451-1.54944I$	$6.35169-5.37662I$	$3.47961+2.73445I$
$u=-0.833145+0.972573I$ $a=\ \ 0.422071+0.340573I$ $b=\ \ 0.341866-0.590665I$	$5.53074-11.34930I$	$2.00299+7.67243I$
$u=-0.833145+0.972573I$ $a=-2.64455+0.38053I$ $b=-1.00673+1.69571I$	$5.53074-11.34930I$	$2.00299+7.67243I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.833145 - 0.972573I$ $a = 0.422071 - 0.340573I$ $b = 0.341866 + 0.590665I$	$5.53074 + 11.34930I$	$2.00299 - 7.67243I$
$u = -0.833145 - 0.972573I$ $a = -2.64455 - 0.38053I$ $b = -1.00673 - 1.69571I$	$5.53074 + 11.34930I$	$2.00299 - 7.67243I$
$u = 0.627727 + 0.308177I$ $a = 0.116909 - 0.679446I$ $b = -0.457619 - 0.120076I$	$-0.39198 - 3.74340I$	$3.21764 + 3.16701I$
$u = 0.627727 + 0.308177I$ $a = 0.38122 - 1.46585I$ $b = 0.541718 - 1.267480I$	$-0.39198 - 3.74340I$	$3.21764 + 3.16701I$
$u = 0.627727 - 0.308177I$ $a = 0.116909 + 0.679446I$ $b = -0.457619 + 0.120076I$	$-0.39198 + 3.74340I$	$3.21764 - 3.16701I$
$u = 0.627727 - 0.308177I$ $a = 0.38122 + 1.46585I$ $b = 0.541718 + 1.267480I$	$-0.39198 + 3.74340I$	$3.21764 - 3.16701I$
$u = 0.451236$ $a = 1.49511 + 0.78863I$ $b = -0.036079 + 1.103390I$	-4.65622	-2.67120
$u = 0.451236$ $a = 1.49511 - 0.78863I$ $b = -0.036079 - 1.103390I$	-4.65622	-2.67120

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

(i) Arc colorings

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

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

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

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

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

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

$$a_8 = \begin{pmatrix} -u^2 - 1 \\ -u^2 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -\frac{1}{2}u^2 - u - \frac{1}{2} \\ -\frac{3}{2}u^2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} \frac{3}{2}u^2 - u + \frac{3}{2} \\ \frac{1}{2}u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{4}u^3 + \frac{1}{4} \\ \frac{1}{4}u^3 - \frac{1}{4}u^2 - \frac{1}{4} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{1}{2}u^2 - u + \frac{1}{2} \\ -\frac{1}{2}u^2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -\frac{15}{4}u^3 + \frac{15}{4}u^2 - 4u + \frac{7}{4}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^4 - u^3 + 3u^2 - 2u + 1$
c_2	$u^4 - u^3 + u^2 + 1$
c_3	$16(16u^4 + 8u^3 + 12u^2 + 4u + 1)$
c_4	$16(16u^4 - 8u^3 + 12u^2 - 4u + 1)$
c_6	$u^4 + u^3 + u^2 + 1$
c_7	$u^4 + u^3 + 3u^2 + 2u + 1$
c_8, c_9	$(u + 1)^4$
c_{10}	u^4
c_{11}, c_{12}	$(u - 1)^4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$y^4 + 5y^3 + 7y^2 + 2y + 1$
c_2, c_6	$y^4 + y^3 + 3y^2 + 2y + 1$
c_3, c_4	$256(256y^4 + 320y^3 + 112y^2 + 8y + 1)$
c_8, c_9, c_{11} c_{12}	$(y-1)^4$
c_{10}	y^4

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351808 + 0.720342I$ $a = 0.654246 - 0.973764I$ $b = 0.197562 + 0.253422I$	$1.43393 - 1.41510I$	$-0.21489 - 4.38336I$
$u = -0.351808 - 0.720342I$ $a = 0.654246 + 0.973764I$ $b = 0.197562 - 0.253422I$	$1.43393 + 1.41510I$	$-0.21489 + 4.38336I$
$u = 0.851808 + 0.911292I$ $a = -0.404246 - 0.135046I$ $b = 0.052438 - 0.776246I$	$8.43568 + 3.16396I$	$3.58989 - 2.42402I$
$u = 0.851808 - 0.911292I$ $a = -0.404246 + 0.135046I$ $b = 0.052438 + 0.776246I$	$8.43568 - 3.16396I$	$3.58989 + 2.42402I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5, c_6	$(u^2 - u + 1)^2$
c_2, c_7	$(u^2 + u + 1)^2$
c_3	$u^4 - 2u^3 + 2u^2 - 4u + 4$
c_4	$u^4 + 2u^3 + 2u^2 + 4u + 4$
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_5 c_6, c_7	$(y^2 + y + 1)^2$
c_3, c_4	$y^4 - 4y^2 + 16$
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
$u = -0.500000 + 0.866025I$ $a = \quad 0.732051$ $b = -0.500000 - 0.133975I$	$-3.28987 - 2.02988I$	$-6.00000 + 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -2.73205$ $b = -0.50000 + 1.86603I$	$-3.28987 - 2.02988I$	$-6.00000 + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = \quad 0.732051$ $b = -0.500000 + 0.133975I$	$-3.28987 + 2.02988I$	$-6.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -2.73205$ $b = -0.50000 - 1.86603I$	$-3.28987 + 2.02988I$	$-6.00000 - 3.46410I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5	$((u^2-u+1)^2)(u^4-u^3+3u^2-2u+1)(u^{29}+7u^{28}+\cdots-u-1)^2$ $\cdot\,(u^{38}+10u^{37}+\cdots+31u+16)$
c_2	$((u^2+u+1)^2)(u^4-u^3+u^2+1)(u^{29}-u^{28}+\cdots+u+1)^2$ $\cdot\,(u^{38}-2u^{37}+\cdots-11u+4)$
c_3	$256(u^4-2u^3+2u^2-4u+4)(16u^4+8u^3+12u^2+4u+1)$ $\cdot\,(16u^{38}-24u^{37}+\cdots+8u+4)(u^{58}+3u^{57}+\cdots-2526u+541)$
c_4	$256(u^4+2u^3+2u^2+4u+4)(16u^4-8u^3+12u^2-4u+1)$ $\cdot\,(16u^{38}-24u^{37}+\cdots+8u+4)(u^{58}+3u^{57}+\cdots-2526u+541)$
c_6	$((u^2-u+1)^2)(u^4+u^3+u^2+1)(u^{29}-u^{28}+\cdots+u+1)^2$ $\cdot\,(u^{38}-2u^{37}+\cdots-11u+4)$
c_7	$((u^2+u+1)^2)(u^4+u^3+3u^2+2u+1)(u^{29}+7u^{28}+\cdots-u-1)^2$ $\cdot\,(u^{38}+10u^{37}+\cdots+31u+16)$
c_8, c_9	$((u+1)^4)(u^2+1)^2(u^{38}-4u^{37}+\cdots+26u^2+1)$ $\cdot\,(u^{58}+9u^{57}+\cdots+4u+1)$
c_{10}	$u^4(u^4-u^2+1)(u^{29}-u^{28}+\cdots+3u-1)^2$ $\cdot\,(u^{38}+3u^{37}+\cdots+2944u+512)$
c_{11}, c_{12}	$((u-1)^4)(u^2+1)^2(u^{38}-4u^{37}+\cdots+26u^2+1)$ $\cdot\,(u^{58}+9u^{57}+\cdots+4u+1)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5, c_7	$((y^2+y+1)^2)(y^4+5y^3+\cdots+2y+1)(y^{29}+31y^{28}+\cdots+15y-1)^2$ $\cdot(y^{38}+38y^{37}+\cdots-865y+256)$
c_2, c_6	$((y^2+y+1)^2)(y^4+y^3+3y^2+2y+1)(y^{29}+7y^{28}+\cdots-y-1)^2$ $\cdot(y^{38}+10y^{37}+\cdots+31y+16)$
c_3, c_4	$65536(y^4-4y^2+16)(256y^4+320y^3+112y^2+8y+1)$ $\cdot(256y^{38}+1856y^{37}+\cdots+368y+16)$ $\cdot(y^{58}-21y^{57}+\cdots-31273168y+292681)$
c_8, c_9, c_{11} c_{12}	$((y-1)^4)(y+1)^4(y^{38}+14y^{37}+\cdots+52y+1)$ $\cdot(y^{58}+35y^{57}+\cdots+128y+1)$
c_{10}	$y^4(y^2-y+1)^2(y^{29}-9y^{28}+\cdots-y-1)^2$ $\cdot(y^{38}-11y^{37}+\cdots-2867200y+262144)$