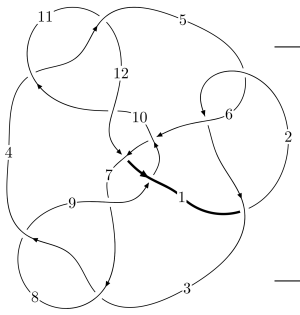
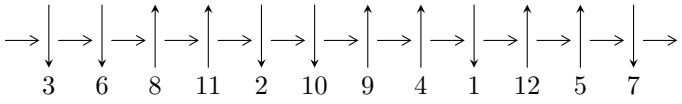
$12a_{0323}$ ($K12a_{0323}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle 6.55331 \times 10^{30} u^{30} + 1.64150 \times 10^{31} u^{29} + \cdots + 3.56183 \times 10^{31} b + 4.47272 \times 10^{31}, \\
&\quad 1.84263 \times 10^{31} u^{30} + 6.93262 \times 10^{29} u^{29} + \cdots + 3.56183 \times 10^{31} a + 6.39301 \times 10^{31},\ u^{31} + u^{30} + \cdots + 4u^2 + 1 \rangle \\
I_2^u &= \langle -5.81751 \times 10^{941} u^{125} + 8.58847 \times 10^{942} u^{124} + \cdots + 3.92230 \times 10^{942} b - 1.21679 \times 10^{942}, \\
&\quad -2.73119 \times 10^{942} u^{125} + 4.02364 \times 10^{943} u^{124} + \cdots + 3.92230 \times 10^{942} a - 5.31484 \times 10^{943}, \\
&\quad u^{126} - 15u^{125} + \cdots - 10u + 1 \rangle \\
I_3^u &= \langle u^9 - u^7 - u^6 - u^5 + u^3 + b + u,\ u^{14} + 2u^{13} - 2u^{11} - 4u^{10} - 4u^9 + 2u^7 + 2u^6 + 3u^5 - u^2 + a, \\
&\quad u^{15} + u^{14} - u^{12} - 3u^{11} - 3u^{10} - u^9 + 3u^7 + 3u^6 + 2u^5 + u^4 - u^3 - u^2 - u - 1 \rangle \\
I_4^u &= \langle u^{15} + 2u^{14} - 2u^{13} - 5u^{12} + 2u^{11} + 6u^{10} - 3u^9 - 8u^8 + u^7 + 3u^6 + u^4 - 2u^2 + b - 2u + 3, \\
&\quad -14u^{15} - 10u^{14} + \cdots + a + 18, \\
&\quad u^{16} - 3u^{14} + 2u^{13} + 4u^{12} - 3u^{11} - 4u^{10} + 4u^9 + 3u^8 - 6u^7 + 5u^6 - 3u^5 + 2u^4 - 4u^3 + 6u^2 - 4u + 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 188 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.

$\boldsymbol{I_1^u = \langle 6.55\times 10^{30}u^{30}+1.64\times 10^{31}u^{29}+\cdots+3.56\times 10^{31}b+4.47\times 10^{31},\ 1.84\times 10^{31}u^{30}+6.93\times 10^{29}u^{29}+\cdots+3.56\times 10^{31}a+6.39\times 10^{31},\ u^{31}+u^{30}+\cdots+4u^2+1\rangle}$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} -0.517327u^{30} - 0.0194636u^{29} + \cdots - 5.01519u - 1.79487 \\ -0.183987u^{30} - 0.460859u^{29} + \cdots - 0.222841u - 1.25573 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 0.216938u^{30} + 0.559109u^{29} + \cdots + 4.24716u + 0.409583 \\ -0.127744u^{30} + 0.156322u^{29} + \cdots + 0.655318u - 0.0581050 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.608908u^{30} + 0.513421u^{29} + \cdots - 0.141955u - 2.34677 \\ 0.437378u^{30} + 0.0595317u^{29} + \cdots + 0.528023u - 0.947344 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1.55810u^{30} + 0.725606u^{29} + \cdots - 3.80603u - 2.48799 \\ 0.329814u^{30} - 0.151160u^{29} + \cdots - 1.45162u - 0.00731807 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.344682u^{30} + 0.402787u^{29} + \cdots + 3.59184u + 0.467688 \\ -0.127744u^{30} + 0.156322u^{29} + \cdots + 0.655318u - 0.0581050 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.344682u^{30} + 0.402787u^{29} + \cdots + 4.59184u + 0.467688 \\ -0.127744u^{30} + 0.156322u^{29} + \cdots + 0.655318u - 0.0581050 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 2.15136u^{30} + 0.404329u^{29} + \cdots - 1.94509u - 1.88658 \\ 0.440312u^{30} + 0.351852u^{29} + \cdots - 1.62334u + 0.799685 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1.06778u^{30} + 1.15510u^{29} + \cdots + 6.10440u - 1.82049 \\ 0.0239911u^{30} - 0.155795u^{29} + \cdots - 0.412459u - 0.145425 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.182230u^{30} + 0.115877u^{29} + \cdots - 3.91942u + 3.96267 \\ 0.266137u^{30} + 0.197519u^{29} + \cdots + 0.0212995u - 0.0373999 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.100681u^{30} + 1.00392u^{29} + \cdots - 7.27867u + 2.00104$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{31}+12u^{30}+\cdots+5632u+1024$
c_2, c_5	$u^{31}+12u^{30}+\cdots-224u-32$
c_3, c_4, c_8 c_{11}	$u^{31}-7u^{29}+\cdots+3u+1$
c_6, c_9	$u^{31}+u^{30}+\cdots+4u^2+1$
c_7, c_{10}	$u^{31}-14u^{30}+\cdots+11u-1$
c_{12}	$u^{31}+28u^{30}+\cdots+116736u+10240$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{31} + 12y^{30} + \cdots - 393216y - 1048576$
c_2, c_5	$y^{31} - 12y^{30} + \cdots + 5632y - 1024$
c_3, c_4, c_8 c_{11}	$y^{31} - 14y^{30} + \cdots + 11y - 1$
c_6, c_9	$y^{31} + 5y^{30} + \cdots - 8y - 1$
c_7, c_{10}	$y^{31} + 10y^{30} + \cdots + 95y - 1$
c_{12}	$y^{31} - 8y^{30} + \cdots + 69206016y - 104857600$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.084144 + 1.039664I$ $a = -1.269352 + 0.109533I$ $b = 0.962289 - 0.520246I$	$3.19876 - 7.55195I$	$5.48862 + 9.87953I$
$u = 0.084144 - 1.039664I$ $a = -1.269352 - 0.109533I$ $b = 0.962289 + 0.520246I$	$3.19876 + 7.55195I$	$5.48862 - 9.87953I$
$u = -0.469459 + 1.009713I$ $a = 0.218341 - 0.735028I$ $b = -0.879624 + 0.475488I$	$2.43175 - 0.36874I$	$2.25000 + 2.94789I$
$u = -0.469459 - 1.009713I$ $a = 0.218341 + 0.735028I$ $b = -0.879624 - 0.475488I$	$2.43175 + 0.36874I$	$2.25000 - 2.94789I$
$u = 0.860162 + 0.786995I$ $a = 0.78085 + 1.82232I$ $b = -1.020462 + 0.682561I$	$-5.34193 - 10.63260I$	$-3.15069 + 9.70062I$
$u = 0.860162 - 0.786995I$ $a = 0.78085 - 1.82232I$ $b = -1.020462 - 0.682561I$	$-5.34193 + 10.63260I$	$-3.15069 - 9.70062I$
$u = -1.21341$ $a = -0.0217834$ $b = -0.330185$	-2.42715	-5.31520
$u = 0.387802 + 1.194509I$ $a = 0.298582 - 0.479894I$ $b = -1.157971 - 0.198479I$	$8.01085 + 1.87526I$	$9.36813 - 2.63874I$
$u = 0.387802 - 1.194509I$ $a = 0.298582 + 0.479894I$ $b = -1.157971 + 0.198479I$	$8.01085 - 1.87526I$	$9.36813 + 2.63874I$
$u = -1.117652 + 0.663220I$ $a = 0.785976 - 0.601863I$ $b = 0.695306 - 0.761608I$	$-7.37204 - 0.41255I$	$-6.92882 + 2.19694I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.117652-0.663220I$ $a=\ \ 0.785976+0.601863I$ $b=\ \ 0.695306+0.761608I$	$-7.37204+0.41255I$	$-6.92882-2.19694I$
$u=-0.534239+0.421201I$ $a=\ \ 0.94640+3.61057I$ $b=\ \ 1.042485+0.517986I$	$0.94025+10.62460I$	$2.5262-14.8925I$
$u=-0.534239-0.421201I$ $a=\ \ 0.94640-3.61057I$ $b=\ \ 1.042485-0.517986I$	$0.94025-10.62460I$	$2.5262+14.8925I$
$u=-1.007284+0.875628I$ $a=-0.307838+0.750851I$ $b=-0.484729+0.824665I$	$-2.35818+2.80518I$	$-2.26135-0.49699I$
$u=-1.007284-0.875628I$ $a=-0.307838-0.750851I$ $b=-0.484729-0.824665I$	$-2.35818-2.80518I$	$-2.26135+0.49699I$
$u=-0.416545+0.469850I$ $a=\ \ 0.614182+0.161827I$ $b=-0.022556+0.572988I$	$-0.57873+1.51038I$	$-2.67375-4.66317I$
$u=-0.416545-0.469850I$ $a=\ \ 0.614182-0.161827I$ $b=-0.022556-0.572988I$	$-0.57873-1.51038I$	$-2.67375+4.66317I$
$u=\ \ 0.652733+1.249388I$ $a=-0.189535+0.299518I$ $b=\ \ 1.153307+0.140718I$	$7.25146-3.68008I$	$8.25009+3.16950I$
$u=\ \ 0.652733-1.249388I$ $a=-0.189535-0.299518I$ $b=\ \ 1.153307-0.140718I$	$7.25146+3.68008I$	$8.25009-3.16950I$
$u=-0.135838+0.563252I$ $a=\ \ 2.18955-2.36363I$ $b=-1.026841-0.393178I$	$4.55871+4.50370I$	$11.51940-4.92639I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.135838-0.563252I$ $a=\ \ 2.18955+2.36363I$ $b=-1.026841+0.393178I$	$4.55871-4.50370I$	$11.51940+4.92639I$
$u=\ \ 0.419041+0.284363I$ $a=\ \ 0.070359-1.058717I$ $b=\ \ 0.882191+0.161261I$	$1.83304+0.30388I$	$4.09035+0.14569I$
$u=\ \ 0.419041-0.284363I$ $a=\ \ 0.070359+1.058717I$ $b=\ \ 0.882191-0.161261I$	$1.83304-0.30388I$	$4.09035-0.14569I$
$u=-1.13002+0.99523I$ $a=\ \ 0.384328-0.974043I$ $b=\ \ 0.524500-0.942497I$	$-4.76248+7.98624I$	$-4.49283-4.44036I$
$u=-1.13002-0.99523I$ $a=\ \ 0.384328+0.974043I$ $b=\ \ 0.524500+0.942497I$	$-4.76248-7.98624I$	$-4.49283+4.44036I$
$u=\ \ 0.258738+0.349549I$ $a=-2.82094-1.20057I$ $b=-0.470895-0.606546I$	$-2.41931-1.71382I$	$-3.05380+2.44778I$
$u=\ \ 0.258738-0.349549I$ $a=-2.82094+1.20057I$ $b=-0.470895+0.606546I$	$-2.41931+1.71382I$	$-3.05380-2.44778I$
$u=\ \ 1.03795+1.17821I$ $a=-0.317255-1.306538I$ $b=\ \ 1.129177-0.655726I$	$1.52020-14.00050I$	$2.53500+8.42876I$
$u=\ \ 1.03795-1.17821I$ $a=-0.317255+1.306538I$ $b=\ \ 1.129177+0.655726I$	$1.52020+14.00050I$	$2.53500-8.42876I$
$u=\ \ 1.21717+1.17818I$ $a=\ \ 0.127234+1.383611I$ $b=-1.161086+0.692549I$	$-0.7640-20.0875I$	$0.+11.57868I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.21717 - 1.17818I$		
$a = 0.127234 - 1.383611I$	$-0.7640 + 20.0875I$	$0. - 11.57868I$
$b = -1.161086 - 0.692549I$		

II. $\boldsymbol{I_2^u = \langle -5.82 \times 10^{941} u^{125} + 8.59 \times 10^{942} u^{124} + \cdots + 3.92 \times 10^{942} b - 1.22 \times 10^{942},\ -2.73 \times 10^{942} u^{125} + 4.02 \times 10^{943} u^{124} + \cdots + 3.92 \times 10^{942} a - 5.31 \times 10^{943},\ u^{126} - 15u^{125} + \cdots - 10u + 1 \rangle}$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} 0.696323u^{125} - 10.2584u^{124} + \cdots - 66.3738u + 13.5503 \\ 0.148319u^{125} - 2.18965u^{124} + \cdots - 0.702479u + 0.310223 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -0.0582623u^{125} + 0.933870u^{124} + \cdots - 143.836u + 13.2497 \\ -0.161908u^{125} + 2.39661u^{124} + \cdots - 12.9534u + 0.956689 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1.54346u^{125} - 23.0357u^{124} + \cdots + 124.214u + 1.81945 \\ 0.204893u^{125} - 3.05880u^{124} + \cdots + 12.9608u - 0.797883 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.615790u^{125} - 9.03866u^{124} + \cdots - 104.459u + 15.5686 \\ 0.228570u^{125} - 3.39770u^{124} + \cdots + 1.58590u - 0.205166 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.103646u^{125} - 1.46274u^{124} + \cdots - 130.883u + 12.2930 \\ -0.161908u^{125} + 2.39661u^{124} + \cdots - 12.9534u + 0.956689 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.0448889u^{125} + 0.738359u^{124} + \cdots - 144.652u + 13.3417 \\ -0.173193u^{125} + 2.55966u^{124} + \cdots - 13.0741u + 0.983617 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.645712u^{125} - 9.65714u^{124} + \cdots + 84.5594u - 3.82633 \\ 0.0274567u^{125} - 0.441852u^{124} + \cdots + 5.88458u - 0.629101 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.758231u^{125} - 11.2624u^{124} + \cdots - 32.2325u + 13.3940 \\ 0.105098u^{125} - 1.56250u^{124} + \cdots - 0.481745u + 0.633800 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.617167u^{125} + 9.10795u^{124} + \cdots + 100.828u - 14.9786 \\ -0.0878400u^{125} + 1.30605u^{124} + \cdots + 5.74816u - 0.594280 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 1.18500u^{125} - 17.5443u^{124} + \cdots + 35.1425u - 2.66616$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{63}+29u^{62}+\cdots+399u+25)^2$
c_2, c_5	$(u^{63}-5u^{62}+\cdots+37u-5)^2$
c_3, c_4, c_8 c_{11}	$u^{126}+u^{125}+\cdots+36u+9$
c_6, c_9	$u^{126}-15u^{125}+\cdots-10u+1$
c_7, c_{10}	$u^{126}-53u^{125}+\cdots-2628u+81$
c_{12}	$(u^{63}-13u^{62}+\cdots-5u+1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{63}+19y^{62}+\cdots+4651y-625)^2$
c_2, c_5	$(y^{63}-29y^{62}+\cdots+399y-25)^2$
c_3, c_4, c_8 c_{11}	$y^{126}-53y^{125}+\cdots-2628y+81$
c_6, c_9	$y^{126}-15y^{125}+\cdots+248y+1$
c_7, c_{10}	$y^{126}+51y^{125}+\cdots+935388y+6561$
c_{12}	$(y^{63}-15y^{62}+\cdots+49y-1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.041871+0.086991I$ $a=\ \ 0.106651+0.659044I$ $b=-0.196963+0.634548I$	$-2.40615+0.01706I$	0
$u=-1.041871-0.086991I$ $a=\ \ 0.106651-0.659044I$ $b=-0.196963-0.634548I$	$-2.40615-0.01706I$	0
$u=\ \ 0.447529+0.839925I$ $a=\ \ 0.529540-0.312626I$ $b=-1.275041-0.062031I$	$5.57710-5.64020I$	0
$u=\ \ 0.447529-0.839925I$ $a=\ \ 0.529540+0.312626I$ $b=-1.275041+0.062031I$	$5.57710+5.64020I$	0
$u=-0.904169+0.533833I$ $a=\ \ 0.002039-1.079744I$ $b=-1.196784-0.631391I$	$0.38539+5.30492I$	0
$u=-0.904169-0.533833I$ $a=\ \ 0.002039+1.079744I$ $b=-1.196784+0.631391I$	$0.38539-5.30492I$	0
$u=-0.931507+0.182036I$ $a=\ \ 0.140837+1.105782I$ $b=\ \ 0.220517+1.076032I$	$-3.86874-3.84740I$	0
$u=-0.931507-0.182036I$ $a=\ \ 0.140837-1.105782I$ $b=\ \ 0.220517-1.076032I$	$-3.86874+3.84740I$	0
$u=-0.883551+0.346025I$ $a=-0.16505+1.54628I$ $b=\ \ 1.193652+0.560788I$	$0.81103+4.65824I$	0
$u=-0.883551-0.346025I$ $a=-0.16505-1.54628I$ $b=\ \ 1.193652-0.560788I$	$0.81103-4.65824I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.828283 + 0.446669I$ $a = 0.069163 - 1.144444I$ $b = 1.072744 - 0.653846I$	$0.067312 - 1.017350I$	0
$u = 0.828283 - 0.446669I$ $a = 0.069163 + 1.144444I$ $b = 1.072744 + 0.653846I$	$0.067312 + 1.017350I$	0
$u = -0.281852 + 1.028357I$ $a = 0.641319 - 0.218069I$ $b = -1.088591 - 0.334536I$	$2.50341 + 4.73463I$	0
$u = -0.281852 - 1.028357I$ $a = 0.641319 + 0.218069I$ $b = -1.088591 + 0.334536I$	$2.50341 - 4.73463I$	0
$u = 0.461999 + 0.809904I$ $a = -0.283438 - 0.866112I$ $b = 1.029079 + 0.162258I$	$1.82989 + 0.00826I$	0
$u = 0.461999 - 0.809904I$ $a = -0.283438 + 0.866112I$ $b = 1.029079 - 0.162258I$	$1.82989 - 0.00826I$	0
$u = -0.525617 + 0.937016I$ $a = 0.226511 - 0.805413I$ $b = -1.045075 + 0.320939I$	$2.19990 + 4.01790I$	0
$u = -0.525617 - 0.937016I$ $a = 0.226511 + 0.805413I$ $b = -1.045075 - 0.320939I$	$2.19990 - 4.01790I$	0
$u = 0.916902 + 0.019751I$ $a = 0.154113 + 0.799212I$ $b = 0.565274 + 0.789159I$	$-1.50295 + 4.40389I$	0
$u = 0.916902 - 0.019751I$ $a = 0.154113 - 0.799212I$ $b = 0.565274 - 0.789159I$	$-1.50295 - 4.40389I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.430967 + 0.997335I$ $a = -0.240799 - 0.693857I$ $b = 0.725649 + 0.459266I$	$2.37286 - 3.46728I$	0
$u = 0.430967 - 0.997335I$ $a = -0.240799 + 0.693857I$ $b = 0.725649 - 0.459266I$	$2.37286 + 3.46728I$	0
$u = -0.115187 + 1.081445I$ $a = 1.100285 + 0.181739I$ $b = -0.867542 - 0.461944I$	$2.37286 + 3.46728I$	0
$u = -0.115187 - 1.081445I$ $a = 1.100285 - 0.181739I$ $b = -0.867542 + 0.461944I$	$2.37286 - 3.46728I$	0
$u = -0.265622 + 0.871434I$ $a = -0.545305 - 0.493257I$ $b = 1.185667 - 0.038115I$	$3.45279 + 0.77574I$	0
$u = -0.265622 - 0.871434I$ $a = -0.545305 + 0.493257I$ $b = 1.185667 + 0.038115I$	$3.45279 - 0.77574I$	0
$u = -0.861309 + 0.257273I$ $a = 0.136789 + 1.296927I$ $b = 1.26829 + 0.71351I$	$-0.74509 + 10.25710I$	0
$u = -0.861309 - 0.257273I$ $a = 0.136789 - 1.296927I$ $b = 1.26829 - 0.71351I$	$-0.74509 - 10.25710I$	0
$u = 0.115055 + 0.889723I$ $a = -1.50506 - 0.40824I$ $b = 1.057783 - 0.452075I$	$4.14790 - 2.17573I$	0
$u = 0.115055 - 0.889723I$ $a = -1.50506 + 0.40824I$ $b = 1.057783 + 0.452075I$	$4.14790 + 2.17573I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.890223 + 0.685331I$ $a = -0.124561 - 1.005106I$ $b = 1.253089 - 0.331609I$	$1.08734 - 5.02241I$	0
$u = 0.890223 - 0.685331I$ $a = -0.124561 + 1.005106I$ $b = 1.253089 + 0.331609I$	$1.08734 + 5.02241I$	0
$u = -0.916222 + 0.653646I$ $a = 0.081515 - 1.025750I$ $b = -1.289559 - 0.453742I$	$0.89643 + 1.17973I$	0
$u = -0.916222 - 0.653646I$ $a = 0.081515 + 1.025750I$ $b = -1.289559 + 0.453742I$	$0.89643 - 1.17973I$	0
$u = -0.491587 + 1.012769I$ $a = 0.201313 + 0.021183I$ $b = -1.298317 - 0.098154I$	$2.38825 + 5.72533I$	0
$u = -0.491587 - 1.012769I$ $a = 0.201313 - 0.021183I$ $b = -1.298317 + 0.098154I$	$2.38825 - 5.72533I$	0
$u = 0.845880 + 0.216649I$ $a = -0.147211 + 1.221315I$ $b = -0.348213 + 1.060432I$	$-4.24007 - 0.71156I$	0
$u = 0.845880 - 0.216649I$ $a = -0.147211 - 1.221315I$ $b = -0.348213 - 1.060432I$	$-4.24007 + 0.71156I$	0
$u = 0.592686 + 0.969415I$ $a = -0.0936103 + 0.0710144I$ $b = 1.387031 - 0.003973I$	$4.08563 - 10.85580I$	0
$u = 0.592686 - 0.969415I$ $a = -0.0936103 - 0.0710144I$ $b = 1.387031 + 0.003973I$	$4.08563 + 10.85580I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.799637 + 0.237909I$ $a = -0.324291 + 1.356176I$ $b = -1.185136 + 0.770151I$	$-1.75445 - 5.84337I$	0
$u = 0.799637 - 0.237909I$ $a = -0.324291 - 1.356176I$ $b = -1.185136 - 0.770151I$	$-1.75445 + 5.84337I$	0
$u = 0.686450 + 0.434495I$ $a = -0.24412 + 2.34802I$ $b = -1.064980 + 0.607850I$	$-0.86530 - 6.57037I$	0
$u = 0.686450 - 0.434495I$ $a = -0.24412 - 2.34802I$ $b = -1.064980 - 0.607850I$	$-0.86530 + 6.57037I$	0
$u = -1.188059 + 0.106077I$ $a = -0.044362 + 0.343356I$ $b = -0.366194 + 0.295386I$	-2.42241	0
$u = -1.188059 - 0.106077I$ $a = -0.044362 - 0.343356I$ $b = -0.366194 - 0.295386I$	-2.42241	0
$u = 0.993056 + 0.675976I$ $a = -0.875234 - 0.557827I$ $b = -0.636205 - 0.818580I$	$-6.52002 - 5.01612I$	0
$u = 0.993056 - 0.675976I$ $a = -0.875234 + 0.557827I$ $b = -0.636205 + 0.818580I$	$-6.52002 + 5.01612I$	0
$u = 0.656393 + 0.451064I$ $a = -1.261161 - 0.472026I$ $b = -0.324498 + 0.237999I$	$2.50341 - 4.73463I$	0
$u = 0.656393 - 0.451064I$ $a = -1.261161 + 0.472026I$ $b = -0.324498 - 0.237999I$	$2.50341 + 4.73463I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.652324 + 0.394583I$ $a = -0.58792 + 2.35951I$ $b = -1.037074 + 0.610081I$	$-0.86446 - 6.55164I$	0
$u = \quad 0.652324 - 0.394583I$ $a = -0.58792 - 2.35951I$ $b = -1.037074 - 0.610081I$	$-0.86446 + 6.55164I$	0
$u = -0.948002 + 0.807486I$ $a = -0.69229 + 1.70358I$ $b = \quad 0.972794 + 0.671183I$	$-6.52002 + 5.01612I$	0
$u = -0.948002 - 0.807486I$ $a = -0.69229 - 1.70358I$ $b = \quad 0.972794 - 0.671183I$	$-6.52002 - 5.01612I$	0
$u = \quad 0.206054 + 0.712130I$ $a = -0.190318 - 0.321943I$ $b = \quad 0.126021 + 0.491882I$	$1.78680 + 1.54215I$	0
$u = \quad 0.206054 - 0.712130I$ $a = -0.190318 + 0.321943I$ $b = \quad 0.126021 - 0.491882I$	$1.78680 - 1.54215I$	0
$u = \quad 0.886779 + 0.911880I$ $a = \quad 0.305512 + 0.921191I$ $b = \quad 0.339427 + 0.705785I$	$3.45279 - 0.77574I$	0
$u = \quad 0.886779 - 0.911880I$ $a = \quad 0.305512 - 0.921191I$ $b = \quad 0.339427 - 0.705785I$	$3.45279 + 0.77574I$	0
$u = \quad 0.640550 + 0.220518I$ $a = -1.07999 - 1.28099I$ $b = -0.465595 - 0.762255I$	$-2.63608 - 1.36779I$	0
$u = \quad 0.640550 - 0.220518I$ $a = -1.07999 + 1.28099I$ $b = -0.465595 + 0.762255I$	$-2.63608 + 1.36779I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.552695+0.315160I$ $a=2.33290+2.21835I$ $b=0.900745+0.503542I$	$2.19990+4.01790I$	0
$u=-0.552695-0.315160I$ $a=2.33290-2.21835I$ $b=0.900745-0.503542I$	$2.19990-4.01790I$	0
$u=1.011462+0.924017I$ $a=0.357895+0.755136I$ $b=0.447718+0.888326I$	$-0.53886-8.30876I$	0
$u=1.011462-0.924017I$ $a=0.357895-0.755136I$ $b=0.447718-0.888326I$	$-0.53886+8.30876I$	0
$u=1.294486+0.452659I$ $a=0.26149+1.69807I$ $b=-0.904866+0.478440I$	$1.08734-5.02241I$	0
$u=1.294486-0.452659I$ $a=0.26149-1.69807I$ $b=-0.904866-0.478440I$	$1.08734+5.02241I$	0
$u=0.054255+0.575350I$ $a=2.42900+1.34031I$ $b=0.273257-0.327644I$	$-0.86446+6.55164I$	$0.-8.28242I$
$u=0.054255-0.575350I$ $a=2.42900-1.34031I$ $b=0.273257+0.327644I$	$-0.86446-6.55164I$	$0.+8.28242I$
$u=-1.39462+0.28483I$ $a=-0.286737+0.531673I$ $b=-0.668482+0.394014I$	$-2.40615-0.01706I$	0
$u=-1.39462-0.28483I$ $a=-0.286737-0.531673I$ $b=-0.668482-0.394014I$	$-2.40615+0.01706I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.511259 + 0.147110I$ $a = -0.868537 + 0.884684I$ $b = -0.765393 + 1.085949I$	$-4.26452 - 7.61599I$	$-10.4066 + 10.6029I$
$u = 0.511259 - 0.147110I$ $a = -0.868537 - 0.884684I$ $b = -0.765393 - 1.085949I$	$-4.26452 + 7.61599I$	$-10.4066 - 10.6029I$
$u = -0.485848 + 0.201455I$ $a = 1.64759 + 2.65762I$ $b = -0.555319 + 0.011181I$	$-2.63608 - 1.36779I$	$0.61358 + 3.20173I$
$u = -0.485848 - 0.201455I$ $a = 1.64759 - 2.65762I$ $b = -0.555319 - 0.011181I$	$-2.63608 + 1.36779I$	$0.61358 - 3.20173I$
$u = -0.95313 + 1.13255I$ $a = 0.293906 - 1.066594I$ $b = -0.942906 - 0.572711I$	$-1.50295 + 4.40389I$	0
$u = -0.95313 - 1.13255I$ $a = 0.293906 + 1.066594I$ $b = -0.942906 + 0.572711I$	$-1.50295 - 4.40389I$	0
$u = 0.330328 + 0.395239I$ $a = 0.13003 - 2.73038I$ $b = 0.954391 - 0.435423I$	$1.78680 - 1.54215I$	$4.11048 + 1.75365I$
$u = 0.330328 - 0.395239I$ $a = 0.13003 + 2.73038I$ $b = 0.954391 + 0.435423I$	$1.78680 + 1.54215I$	$4.11048 - 1.75365I$
$u = 1.12267 + 0.97219I$ $a = -0.405080 - 0.964591I$ $b = -0.464796 - 0.986897I$	$-2.9168 - 13.9950I$	0
$u = 1.12267 - 0.97219I$ $a = -0.405080 + 0.964591I$ $b = -0.464796 + 0.986897I$	$-2.9168 + 13.9950I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.446376+0.189980I$ $a=\ \ 0.917976+0.772959I$ $b=\ \ 0.577724+1.111885I$	$-4.56851+2.11885I$	$-9.39146-7.27533I$
$u=-0.446376-0.189980I$ $a=\ \ 0.917976-0.772959I$ $b=\ \ 0.577724-1.111885I$	$-4.56851-2.11885I$	$-9.39146+7.27533I$
$u=-0.07148+1.52902I$ $a=\ \ 0.138093+1.100226I$ $b=-0.718639+0.736038I$	$-3.89880-0.46217I$	0
$u=-0.07148-1.52902I$ $a=\ \ 0.138093-1.100226I$ $b=-0.718639-0.736038I$	$-3.89880+0.46217I$	0
$u=\ \ 1.24353+0.91330I$ $a=-0.407085-1.072134I$ $b=-0.480745-0.707041I$	$2.38825-5.72533I$	0
$u=\ \ 1.24353-0.91330I$ $a=-0.407085+1.072134I$ $b=-0.480745+0.707041I$	$2.38825+5.72533I$	0
$u=\ \ 1.01272+1.17200I$ $a=-0.326426-0.986431I$ $b=\ \ 0.792592-0.523362I$	$0.067312+1.017350I$	0
$u=\ \ 1.01272-1.17200I$ $a=-0.326426+0.986431I$ $b=\ \ 0.792592+0.523362I$	$0.067312-1.017350I$	0
$u=-1.03175+1.19617I$ $a=\ \ 0.294656-1.258903I$ $b=-1.093602-0.647754I$	$-0.53886+8.30876I$	0
$u=-1.03175-1.19617I$ $a=\ \ 0.294656+1.258903I$ $b=-1.093602+0.647754I$	$-0.53886-8.30876I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.220052 + 0.356276I$ $a = 2.39196 + 4.23270I$ $b = 0.476964 - 0.166781I$	$-0.86530 + 6.57037I$	$0.70691 - 9.69437I$
$u = 0.220052 - 0.356276I$ $a = 2.39196 - 4.23270I$ $b = 0.476964 + 0.166781I$	$-0.86530 - 6.57037I$	$0.70691 + 9.69437I$
$u = -0.155083 + 0.327738I$ $a = 0.04729 - 5.79682I$ $b = -0.944106 - 0.363537I$	$4.14790 - 2.17573I$	$9.79860 + 0.40015I$
$u = -0.155083 - 0.327738I$ $a = 0.04729 + 5.79682I$ $b = -0.944106 + 0.363537I$	$4.14790 + 2.17573I$	$9.79860 - 0.40015I$
$u = 1.63318 + 0.34675I$ $a = 0.605613 - 1.010136I$ $b = 0.970664 - 0.311921I$	$0.81103 + 4.65824I$	0
$u = 1.63318 - 0.34675I$ $a = 0.605613 + 1.010136I$ $b = 0.970664 + 0.311921I$	$0.81103 - 4.65824I$	0
$u = 1.11287 + 1.25274I$ $a = -0.148958 - 1.272940I$ $b = 1.091453 - 0.569745I$	$5.57710 - 5.64020I$	0
$u = 1.11287 - 1.25274I$ $a = -0.148958 + 1.272940I$ $b = 1.091453 + 0.569745I$	$5.57710 + 5.64020I$	0
$u = -1.22264 + 1.23112I$ $a = -0.109595 + 1.358913I$ $b = 1.122457 + 0.700094I$	$-2.9168 + 13.9950I$	0
$u = -1.22264 - 1.23112I$ $a = -0.109595 - 1.358913I$ $b = 1.122457 - 0.700094I$	$-2.9168 - 13.9950I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.74231 + 0.10822I$ $a = -0.625642 - 1.075980I$ $b = -0.852072 - 0.466395I$	$0.89643 - 1.17973I$	0
$u = 1.74231 - 0.10822I$ $a = -0.625642 + 1.075980I$ $b = -0.852072 + 0.466395I$	$0.89643 + 1.17973I$	0
$u = 0.165282 + 0.171989I$ $a = 1.50571 + 2.05453I$ $b = -0.871311 + 0.948268I$	$-3.89880 + 0.46217I$	$-7.10748 + 3.67230I$
$u = 0.165282 - 0.171989I$ $a = 1.50571 - 2.05453I$ $b = -0.871311 - 0.948268I$	$-3.89880 - 0.46217I$	$-7.10748 - 3.67230I$
$u = -0.113345 + 0.147787I$ $a = -2.26658 + 1.49533I$ $b = 1.062934 + 0.909215I$	$-3.12704 + 5.01347I$	$-9.83252 - 7.05588I$
$u = -0.113345 - 0.147787I$ $a = -2.26658 - 1.49533I$ $b = 1.062934 - 0.909215I$	$-3.12704 - 5.01347I$	$-9.83252 + 7.05588I$
$u = -1.45339 + 1.12190I$ $a = -0.391166 + 1.329084I$ $b = 0.787687 + 0.570097I$	$-4.24007 + 0.71156I$	0
$u = -1.45339 - 1.12190I$ $a = -0.391166 - 1.329084I$ $b = 0.787687 - 0.570097I$	$-4.24007 - 0.71156I$	0
$u = 0.35607 + 1.80833I$ $a = -0.087811 - 0.924520I$ $b = -0.974256 - 0.695576I$	$-3.12704 + 5.01347I$	0
$u = 0.35607 - 1.80833I$ $a = -0.087811 + 0.924520I$ $b = -0.974256 + 0.695576I$	$-3.12704 - 5.01347I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.62861 + 0.93568I$ $a = 0.178674 + 0.635451I$ $b = 0.894224 + 0.532061I$	$0.38539 + 5.30492I$	0
$u = 1.62861 - 0.93568I$ $a = 0.178674 - 0.635451I$ $b = 0.894224 - 0.532061I$	$0.38539 - 5.30492I$	0
$u = 1.43021 + 1.26413I$ $a = 0.017701 + 1.362656I$ $b = -1.067406 + 0.619184I$	$4.08563 - 10.85580I$	0
$u = 1.43021 - 1.26413I$ $a = 0.017701 - 1.362656I$ $b = -1.067406 - 0.619184I$	$4.08563 + 10.85580I$	0
$u = -64.310 + 0.0910089I$ $a = 13.3282 - 6.3075I$ $b = 0.780924 - 0.463508I$	$1.82989 - 0.00826I$	$1.74029 + 0.54114I$
$u = -64.310 - 0.0910089I$ $a = 13.3282 + 6.3075I$ $b = 0.780924 + 0.463508I$	$1.82989 + 0.00826I$	$1.74029 - 0.54114I$
$u = -1.19020 + 1.52181I$ $a = 0.205879 - 1.003015I$ $b = 0.804518 - 0.739832I$	$-4.56851 + 2.11885I$	0
$u = -1.19020 - 1.52181I$ $a = 0.205879 + 1.003015I$ $b = 0.804518 + 0.739832I$	$-4.56851 - 2.11885I$	0
$u = 1.07424 + 1.62767I$ $a = 0.452221 + 1.090449I$ $b = -0.668430 + 0.517504I$	$-1.75445 + 5.84337I$	0
$u = 1.07424 - 1.62767I$ $a = 0.452221 - 1.090449I$ $b = -0.668430 - 0.517504I$	$-1.75445 - 5.84337I$	0

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.87555+0.86297I$ $a=\ \ 0.421088-0.801589I$ $b=\ \ 0.903125-0.571541I$	$-3.86874-3.84740I$	0
$u=-1.87555-0.86297I$ $a=\ \ 0.421088+0.801589I$ $b=\ \ 0.903125+0.571541I$	$-3.86874+3.84740I$	0
$u=-0.89821+1.86761I$ $a=-0.074502+1.199511I$ $b=\ \ 0.902129+0.704443I$	$-4.26452+7.61599I$	0
$u=-0.89821-1.86761I$ $a=-0.074502-1.199511I$ $b=\ \ 0.902129-0.704443I$	$-4.26452-7.61599I$	0
$u=\ \ 1.70455+1.47811I$ $a=-0.250572-0.693364I$ $b=-0.982428-0.555944I$	$-0.74509+10.25710I$	0
$u=\ \ 1.70455-1.47811I$ $a=-0.250572+0.693364I$ $b=-0.982428+0.555944I$	$-0.74509-10.25710I$	0

III.

$\boldsymbol{I_3^u = \langle u^9-u^7-u^6-u^5+u^3+b+u,\ u^{14}+2u^{13}+\cdots-u^2+a,\ u^{15}+u^{14}+\cdots-u-1\rangle}$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} -u^{14} - 2u^{13} + 2u^{11} + 4u^{10} + 4u^9 - 2u^7 - 2u^6 - 3u^5 + u^2 \\ -u^9 + u^7 + u^6 + u^5 - u^3 - u \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} u^{14} + u^{13} + u^{12} - u^{11} - 3u^{10} - 4u^9 - 3u^8 + 3u^6 + 3u^5 + 4u^4 - 2u - 1 \\ u^{14} + u^{13} - 2u^{11} - 3u^{10} - 2u^9 + 2u^7 + 3u^6 + u^5 + u^4 - u^3 - u^2 - u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -2u^{14} - 2u^{13} + \cdots + u + 1 \\ -u^{14} + u^{12} + u^{11} + u^{10} - u^9 - u^8 + u^7 - u^6 + u^5 - u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^{14} + u^{12} + \cdots - 2u - 2 \\ u^{13} - u^{11} - 2u^{10} - 2u^9 + u^8 + 3u^7 + 2u^6 + 2u^5 - u^4 - 2u^2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^{12} + u^{11} - 2u^9 - 3u^8 - 2u^7 + 2u^5 + 3u^4 + u^3 + u^2 - u - 1 \\ u^{14} + u^{13} - 2u^{11} - 3u^{10} - 2u^9 + 2u^7 + 3u^6 + u^5 + u^4 - u^3 - u^2 - u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^{12} + u^{11} - 2u^9 - 3u^8 - 2u^7 + 2u^5 + 3u^4 + u^3 + u^2 - 2u - 1 \\ u^{14} + u^{13} - 2u^{11} - 3u^{10} - 2u^9 + 2u^7 + 3u^6 + u^5 + u^4 - 2u^3 - u^2 - u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -2u^{13} - 2u^{12} + \cdots + u^2 + 2u \\ u^{14} + u^{13} - u^{11} - 3u^{10} - 3u^9 - 2u^8 + 4u^6 + 4u^5 + 3u^4 - 2u^2 - u - 2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^{14} + u^{12} + \cdots - u - 1 \\ -u^{14} + u^{12} + u^{11} + u^{10} - u^8 - u^6 - u^4 + u + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^{13} + u^{12} - u^{10} - 4u^9 - 3u^8 + u^6 + 5u^5 + 3u^4 - 3u \\ -u^{14} - u^{13} + \cdots + 2u + 3 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes

$= -4u^{14} - 3u^{13} + 8u^{11} + 9u^{10} + 6u^9 + 3u^8 - 2u^7 - 5u^6 - 3u^5 - 15u^4 - 2u^3 - 3u^2 + 7$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{15} - 7u^{14} + \cdots + 9u - 1$
c_2	$u^{15} + u^{14} + \cdots + u - 1$
c_3, c_{11}	$u^{15} - 4u^{13} + \cdots - 3u^2 + 1$
c_4, c_8	$u^{15} - 4u^{13} + \cdots + 3u^2 - 1$
c_5	$u^{15} - u^{14} + \cdots + u + 1$
c_6, c_9	$u^{15} + u^{14} + \cdots - u - 1$
c_7, c_{10}	$u^{15} + 8u^{14} + \cdots + 6u + 1$
c_{12}	$u^{15} + 7u^{14} + \cdots - u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{15}+9y^{14}+\cdots+y-1$
c_2, c_5	$y^{15}-7y^{14}+\cdots+9y-1$
c_3, c_4, c_8 c_{11}	$y^{15}-8y^{14}+\cdots+6y-1$
c_6, c_9	$y^{15}-y^{14}+\cdots-y-1$
c_7, c_{10}	$y^{15}+8y^{14}+\cdots-2y-1$
c_{12}	$y^{15}-7y^{14}+\cdots+7y-1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.959611 + 0.119814I$ $a = -0.71912 + 1.24968I$ $b = -0.326295 + 0.536959I$	$-3.56418 + 0.77491I$	$-8.12670 - 0.03965I$
$u = 0.959611 - 0.119814I$ $a = -0.71912 - 1.24968I$ $b = -0.326295 - 0.536959I$	$-3.56418 - 0.77491I$	$-8.12670 + 0.03965I$
$u = -0.421070 + 0.868919I$ $a = 1.58911 - 0.50507I$ $b = -0.966177 - 0.322619I$	$3.91257 + 5.85283I$	$7.42532 - 8.83755I$
$u = -0.421070 - 0.868919I$ $a = 1.58911 + 0.50507I$ $b = -0.966177 + 0.322619I$	$3.91257 - 5.85283I$	$7.42532 + 8.83755I$
$u = 0.170412 + 0.947352I$ $a = 0.24498 + 1.40630I$ $b = -0.892335 + 0.814934I$	$-3.27852 - 7.55546I$	$-0.02233 + 9.91621I$
$u = 0.170412 - 0.947352I$ $a = 0.24498 - 1.40630I$ $b = -0.892335 - 0.814934I$	$-3.27852 + 7.55546I$	$-0.02233 - 9.91621I$
$u = -0.192552 + 1.044028I$ $a = 0.146828 - 0.946761I$ $b = 1.010565 - 0.788445I$	$-2.53502 - 4.70170I$	$3.53112 - 0.11985I$
$u = -0.192552 - 1.044028I$ $a = 0.146828 + 0.946761I$ $b = 1.010565 + 0.788445I$	$-2.53502 + 4.70170I$	$3.53112 + 0.11985I$
$u = -0.865638 + 0.225957I$ $a = 1.12658 - 1.35308I$ $b = 1.089909 - 0.512485I$	$0.76079 - 9.43435I$	$1.85777 + 7.84421I$
$u = -0.865638 - 0.225957I$ $a = 1.12658 + 1.35308I$ $b = 1.089909 + 0.512485I$	$0.76079 + 9.43435I$	$1.85777 - 7.84421I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.312182 + 0.810784I$ $a = -0.72943 - 1.66599I$ $b = \quad 0.850885 + 0.293944I$	$2.99248 - 0.62234I$	$9.40233 + 4.15296I$
$u = \quad 0.312182 - 0.810784I$ $a = -0.72943 + 1.66599I$ $b = \quad 0.850885 - 0.293944I$	$2.99248 + 0.62234I$	$9.40233 - 4.15296I$
$u = -1.116239 + 0.381261I$ $a = \quad 0.007218 - 1.360523I$ $b = -1.091066 - 0.378426I$	$2.69204 + 4.94745I$	$5.69951 - 4.52321I$
$u = -1.116239 - 0.381261I$ $a = \quad 0.007218 + 1.360523I$ $b = -1.091066 + 0.378426I$	$2.69204 - 4.94745I$	$5.69951 + 4.52321I$
$u = \quad 1.30659$ $a = \quad 0.667669$ $b = \quad 0.649029$	-1.96031	12.4660

IV. $I_4^u =$
$\langle u^{15}+2u^{14}+\cdots+b+3,\ -14u^{15}-10u^{14}+\cdots+a+18,\ u^{16}-3u^{14}+\cdots-4u+1\rangle$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} 14u^{15}+10u^{14}+\cdots+51u-18 \\ -u^{15}-2u^{14}+\cdots+2u-3 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -14u^{15}-14u^{14}+\cdots-42u+14 \\ -15u^{15}-15u^{14}+\cdots-43u+14 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -9u^{15}-7u^{14}+\cdots-31u+8 \\ -18u^{15}-10u^{14}+\cdots-70u+23 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -20u^{15}-13u^{14}+\cdots-76u+26 \\ -22u^{15}-11u^{14}+\cdots-89u+33 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^{15}+u^{14}+\cdots-4u^2+u \\ -15u^{15}-15u^{14}+\cdots-43u+14 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -14u^{15}-12u^{14}+\cdots-45u+15 \\ -24u^{15}-19u^{14}+\cdots-80u+27 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 9u^{15}+5u^{14}+\cdots+39u-15 \\ -4u^{15}-5u^{14}+\cdots-7u-1 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 5u^{15}+3u^{14}+\cdots+21u-9 \\ 2u^{15}-8u^{13}+\cdots+11u-5 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^{15}+4u^{13}+\cdots-5u+2 \\ 3u^{15}+4u^{14}+\cdots+6u-1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -42u^{15}-31u^{14}+114u^{13}+17u^{12}-172u^{11}-17u^{10}+191u^9-156u^7+124u^6-87u^5+47u^4-39u^3+143u^2-140u+43$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^8-4u^7+10u^6-17u^5+23u^4-22u^3+14u^2-5u+1)^2$
c_2	$(u^8-2u^6+u^5+3u^4-2u^3-2u^2+u+1)^2$
c_3, c_{11}	$u^{16}-4u^{14}+\cdots-4u^2+1$
c_4, c_8	$u^{16}-4u^{14}+\cdots-4u^2+1$
c_5	$(u^8-2u^6-u^5+3u^4+2u^3-2u^2-u+1)^2$
c_6, c_9	$u^{16}-3u^{14}+\cdots-4u+1$
c_7, c_{10}	$u^{16}+8u^{15}+\cdots+8u+1$
c_{12}	$(u^8-4u^7+6u^6-4u^5+3u^3-2u^2+1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^8+4y^7+10y^6+23y^5+23y^4+10y^3+22y^2+3y+1)^2$
c_2, c_5	$(y^8-4y^7+10y^6-17y^5+23y^4-22y^3+14y^2-5y+1)^2$
c_3, c_4, c_8 c_{11}	$y^{16}-8y^{15}+\cdots-8y+1$
c_6, c_9	$y^{16}-6y^{15}+\cdots-4y+1$
c_7, c_{10}	$y^{16}+4y^{15}+\cdots+4y+1$
c_{12}	$(y^8-4y^7+4y^6+4y^5+2y^4+3y^3+4y^2-4y+1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.653727+0.712407I$ $a=-0.992378-0.790090I$ $b=-0.891583+0.307286I$	$3.61840+3.26075I$	$7.90059-4.19737I$
$u=-0.653727-0.712407I$ $a=-0.992378+0.790090I$ $b=-0.891583-0.307286I$	$3.61840-3.26075I$	$7.90059+4.19737I$
$u=0.784781+0.507096I$ $a=-0.233188-1.067878I$ $b=1.217720-0.429877I$	$1.19791-2.24783I$	$1.73819+5.28133I$
$u=0.784781-0.507096I$ $a=-0.233188+1.067878I$ $b=1.217720+0.429877I$	$1.19791+2.24783I$	$1.73819-5.28133I$
$u=0.815038+0.424790I$ $a=-0.340035-1.055435I$ $b=-0.654563-0.884729I$	$-3.90365-1.24143I$	$-6.82272+4.38958I$
$u=0.815038-0.424790I$ $a=-0.340035+1.055435I$ $b=-0.654563+0.884729I$	$-3.90365+1.24143I$	$-6.82272-4.38958I$
$u=0.780763+0.793495I$ $a=-0.340035+1.055435I$ $b=0.540426+0.730458I$	$-3.90365+1.24143I$	$-6.82272-4.38958I$
$u=0.780763-0.793495I$ $a=-0.340035-1.055435I$ $b=0.540426-0.730458I$	$-3.90365-1.24143I$	$-6.82272+4.38958I$
$u=0.067575+0.857243I$ $a=-0.992378+0.790090I$ $b=1.002516-0.345519I$	$3.61840-3.26075I$	$7.90059+4.19737I$
$u=0.067575-0.857243I$ $a=-0.992378-0.790090I$ $b=1.002516+0.345519I$	$3.61840+3.26075I$	$7.90059-4.19737I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.899321+0.764131I$ $a=-0.43440+2.11305I$ $b=\ \ 0.668186+0.365104I$	$-0.91267-5.73534I$	$1.18394+1.90076I$
$u=-0.899321-0.764131I$ $a=-0.43440-2.11305I$ $b=\ \ 0.668186-0.365104I$	$-0.91267+5.73534I$	$1.18394-1.90076I$
$u=\ \ 0.654473+0.199488I$ $a=-0.43440+2.11305I$ $b=-1.152495+0.629736I$	$-0.91267-5.73534I$	$1.18394+1.90076I$
$u=\ \ 0.654473-0.199488I$ $a=-0.43440-2.11305I$ $b=-1.152495-0.629736I$	$-0.91267+5.73534I$	$1.18394-1.90076I$
$u=-1.54958+0.16338I$ $a=-0.233188-1.067878I$ $b=-0.730207-0.257776I$	$1.19791-2.24783I$	$1.73819+5.28133I$
$u=-1.54958-0.16338I$ $a=-0.233188+1.067878I$ $b=-0.730207+0.257776I$	$1.19791+2.24783I$	$1.73819-5.28133I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^8-4u^7+10u^6-17u^5+23u^4-22u^3+14u^2-5u+1)^2$ $\cdot(u^{15}-7u^{14}+\cdots+9u-1)(u^{31}+12u^{30}+\cdots+5632u+1024)$ $\cdot(u^{63}+29u^{62}+\cdots+399u+25)^2$
c_2	$((u^8-2u^6+\cdots+u+1)^2)(u^{15}+u^{14}+\cdots+u-1)$ $\cdot(u^{31}+12u^{30}+\cdots-224u-32)(u^{63}-5u^{62}+\cdots+37u-5)^2$
c_3, c_{11}	$(u^{15}-4u^{13}+\cdots-3u^2+1)(u^{16}-4u^{14}+\cdots-4u^2+1)$ $\cdot(u^{31}-7u^{29}+\cdots+3u+1)(u^{126}+u^{125}+\cdots+36u+9)$
c_4, c_8	$(u^{15}-4u^{13}+\cdots+3u^2-1)(u^{16}-4u^{14}+\cdots-4u^2+1)$ $\cdot(u^{31}-7u^{29}+\cdots+3u+1)(u^{126}+u^{125}+\cdots+36u+9)$
c_5	$((u^8-2u^6+\cdots-u+1)^2)(u^{15}-u^{14}+\cdots+u+1)$ $\cdot(u^{31}+12u^{30}+\cdots-224u-32)(u^{63}-5u^{62}+\cdots+37u-5)^2$
c_6, c_9	$(u^{15}+u^{14}+\cdots-u-1)(u^{16}-3u^{14}+\cdots-4u+1)$ $\cdot(u^{31}+u^{30}+\cdots+4u^2+1)(u^{126}-15u^{125}+\cdots-10u+1)$
c_7, c_{10}	$(u^{15}+8u^{14}+\cdots+6u+1)(u^{16}+8u^{15}+\cdots+8u+1)$ $\cdot(u^{31}-14u^{30}+\cdots+11u-1)(u^{126}-53u^{125}+\cdots-2628u+81)$
c_{12}	$((u^8-4u^7+\cdots-2u^2+1)^2)(u^{15}+7u^{14}+\cdots-u+1)$ $\cdot(u^{31}+28u^{30}+\cdots+116736u+10240)(u^{63}-13u^{62}+\cdots-5u+1)^2$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^8+4y^7+10y^6+23y^5+23y^4+10y^3+22y^2+3y+1)^2$ $\cdot(y^{15}+9y^{14}+\cdots+y-1)(y^{31}+12y^{30}+\cdots-393216y-1048576)$ $\cdot(y^{63}+19y^{62}+\cdots+4651y-625)^2$
c_2, c_5	$(y^8-4y^7+10y^6-17y^5+23y^4-22y^3+14y^2-5y+1)^2$ $\cdot(y^{15}-7y^{14}+\cdots+9y-1)(y^{31}-12y^{30}+\cdots+5632y-1024)$ $\cdot(y^{63}-29y^{62}+\cdots+399y-25)^2$
c_3, c_4, c_8 c_{11}	$(y^{15}-8y^{14}+\cdots+6y-1)(y^{16}-8y^{15}+\cdots-8y+1)$ $\cdot(y^{31}-14y^{30}+\cdots+11y-1)(y^{126}-53y^{125}+\cdots-2628y+81)$
c_6, c_9	$(y^{15}-y^{14}+\cdots-y-1)(y^{16}-6y^{15}+\cdots-4y+1)$ $\cdot(y^{31}+5y^{30}+\cdots-8y-1)(y^{126}-15y^{125}+\cdots+248y+1)$
c_7, c_{10}	$(y^{15}+8y^{14}+\cdots-2y-1)(y^{16}+4y^{15}+\cdots+4y+1)$ $\cdot(y^{31}+10y^{30}+\cdots+95y-1)(y^{126}+51y^{125}+\cdots+935388y+6561)$
c_{12}	$(y^8-4y^7+4y^6+4y^5+2y^4+3y^3+4y^2-4y+1)^2$ $\cdot(y^{15}-7y^{14}+\cdots+7y-1)$ $\cdot(y^{31}-8y^{30}+\cdots+69206016y-104857600)$ $\cdot(y^{63}-15y^{62}+\cdots+49y-1)^2$