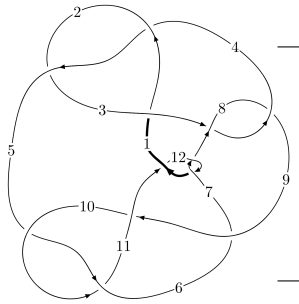
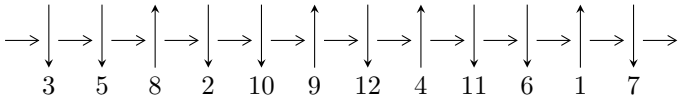
$12a_{0090}$ $(K12a_{0090})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u &= \langle -1.89807 \times 10^{152} u^{131} - 2.61475 \times 10^{152} u^{130} + \cdots + 9.05319 \times 10^{152} b + 3.52721 \times 10^{153}, \\
&\quad 6.80701 \times 10^{152} u^{131} + 3.00477 \times 10^{153} u^{130} + \cdots + 1.53904 \times 10^{154} a - 7.27540 \times 10^{154}, \\
&\quad u^{132} + 2u^{131} + \cdots - 19u - 17 \rangle \\
I_2^u &= \langle b + 1,\ 2u^8 + u^7 - 5u^6 - 3u^5 + 4u^4 + 3u^3 + 2u^2 + a - 2,\ u^9 + u^8 - 2u^7 - 3u^6 + u^5 + 3u^4 + 2u^3 - u - 1 \rangle \\
I_3^u &= \langle 6u^3 a^2 - 2a^2 u^2 - 2u^3 a - 3a^2 u - 11u^2 a + 9u^3 + 2a^2 - 4au + 13u^2 + 23b + 26a - 19u - 4, \\
&\quad a^2 u^2 - 5u^3 a + a^3 - 3a^2 u - 2u^3 - 2a^2 + au - u^2 + a + 2u,\ u^4 - u^2 + 1 \rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 153 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. $\boldsymbol{I_1^u = \langle -1.90 \times 10^{152} u^{131} - 2.61 \times 10^{152} u^{130} + \cdots + 9.05 \times 10^{152} b + 3.53 \times 10^{153},\ 6.81 \times 10^{152} u^{131} + 3.00 \times 10^{153} u^{130} + \cdots + 1.54 \times 10^{154} a - 7.28 \times 10^{154},\ u^{132} + 2u^{131} + \cdots - 19u - 17 \rangle}$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -0.0442288u^{131} - 0.195236u^{130} + \cdots - 4.35303u + 4.72722 \\ 0.209657u^{131} + 0.288821u^{130} + \cdots - 0.869729u - 3.89610 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.165429u^{131} + 0.0935846u^{130} + \cdots - 5.22276u + 0.831125 \\ 0.209657u^{131} + 0.288821u^{130} + \cdots - 0.869729u - 3.89610 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.0596357u^{131} - 0.160770u^{130} + \cdots + 2.00581u + 2.68170 \\ 0.0372237u^{131} + 0.0353922u^{130} + \cdots - 2.49460u - 2.42937 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.0650310u^{131} - 0.298884u^{130} + \cdots - 6.45305u - 3.27408 \\ -0.238080u^{131} - 0.407791u^{130} + \cdots - 3.33764u + 0.873239 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^6 - u^4 + 1 \\ u^8 - 2u^6 + 2u^4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.245372u^{131} + 0.352709u^{130} + \cdots - 0.795055u - 1.32177 \\ -0.0921465u^{131} - 0.0203027u^{130} + \cdots + 1.54595u - 1.62641 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -0.169720u^{131} - 0.238241u^{130} + \cdots + 2.75421u + 4.82837 \\ 0.0461740u^{131} + 0.0537793u^{130} + \cdots - 1.73822u - 2.20458 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.807591u^{131} + 1.32474u^{130} + \cdots + 3.73363u - 7.57808$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{132} + 62u^{131} + \cdots + 657u + 1$
c_2, c_4	$u^{132} - 14u^{131} + \cdots + 57u - 1$
c_3, c_8	$u^{132} + u^{131} + \cdots - 1024u + 512$
c_5, c_{10}	$u^{132} + 2u^{131} + \cdots - 19u - 17$
c_6	$u^{132} + 6u^{131} + \cdots - 19963915u - 1325201$
c_7, c_{12}	$u^{132} + 2u^{131} + \cdots - 273u - 49$
c_9	$u^{132} + 64u^{131} + \cdots + 2163u + 289$
c_{11}	$u^{132} - 66u^{131} + \cdots + 6125u + 2401$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{132} + 30y^{131} + \cdots + 816247y + 1$
c_2, c_4	$y^{132} - 62y^{131} + \cdots - 657y + 1$
c_3, c_8	$y^{132} - 69y^{131} + \cdots - 21233664y + 262144$
c_5, c_{10}	$y^{132} - 64y^{131} + \cdots - 2163y + 289$
c_6	$y^{132} + 32y^{131} + \cdots - 307315706207635y + 1756157690401$
c_7, c_{12}	$y^{132} + 66y^{131} + \cdots - 6125y + 2401$
c_9	$y^{132} + 16y^{131} + \cdots - 345303y + 83521$
c_{11}	$y^{132} + 14y^{131} + \cdots - 531353305y + 5764801$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.938713 + 0.353789I$ $a = -0.912868 + 0.245129I$ $b = 0.852741 - 0.845895I$	$3.55706 + 1.60482I$	0
$u = 0.938713 - 0.353789I$ $a = -0.912868 - 0.245129I$ $b = 0.852741 + 0.845895I$	$3.55706 - 1.60482I$	0
$u = 0.996053 + 0.218414I$ $a = 0.806619 + 0.651472I$ $b = 0.655788 + 0.568246I$	$2.67708 - 2.86490I$	0
$u = 0.996053 - 0.218414I$ $a = 0.806619 - 0.651472I$ $b = 0.655788 - 0.568246I$	$2.67708 + 2.86490I$	0
$u = -0.659438 + 0.782868I$ $a = -0.52968 + 1.82091I$ $b = 1.102780 - 0.631878I$	$4.31397 + 10.01200I$	0
$u = -0.659438 - 0.782868I$ $a = -0.52968 - 1.82091I$ $b = 1.102780 + 0.631878I$	$4.31397 - 10.01200I$	0
$u = 0.749682 + 0.698412I$ $a = -0.21443 - 1.76193I$ $b = 0.995579 + 0.602572I$	$2.40654 - 5.39653I$	0
$u = 0.749682 - 0.698412I$ $a = -0.21443 + 1.76193I$ $b = 0.995579 - 0.602572I$	$2.40654 + 5.39653I$	0
$u = -0.610161 + 0.753804I$ $a = -0.62566 - 1.42738I$ $b = 0.454578 + 0.827217I$	$6.25569 + 4.57061I$	0
$u = -0.610161 - 0.753804I$ $a = -0.62566 + 1.42738I$ $b = 0.454578 - 0.827217I$	$6.25569 - 4.57061I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.947583 + 0.406143I$ $a = 0.50762 - 1.84077I$ $b = 0.902846 + 0.825452I$	$3.41020 - 4.58419I$	0
$u = 0.947583 - 0.406143I$ $a = 0.50762 + 1.84077I$ $b = 0.902846 - 0.825452I$	$3.41020 + 4.58419I$	0
$u = -0.872602 + 0.556297I$ $a = 2.17519 - 4.29494I$ $b = -1.017190 + 0.072632I$	$-0.09566 + 2.10504I$	0
$u = -0.872602 - 0.556297I$ $a = 2.17519 + 4.29494I$ $b = -1.017190 - 0.072632I$	$-0.09566 - 2.10504I$	0
$u = -0.963172$ $a = 0.839614$ $b = 0.413715$	-1.60890	0
$u = -0.947959 + 0.466021I$ $a = -3.79700 - 1.54368I$ $b = -1.044910 - 0.117448I$	$-0.16618 + 1.93886I$	0
$u = -0.947959 - 0.466021I$ $a = -3.79700 + 1.54368I$ $b = -1.044910 + 0.117448I$	$-0.16618 - 1.93886I$	0
$u = 0.802222 + 0.492448I$ $a = 0.969752 + 0.187116I$ $b = 0.0300035 - 0.0194640I$	$1.74437 - 2.05841I$	0
$u = 0.802222 - 0.492448I$ $a = 0.969752 - 0.187116I$ $b = 0.0300035 + 0.0194640I$	$1.74437 + 2.05841I$	0
$u = 0.641510 + 0.685847I$ $a = 1.23681 + 2.06522I$ $b = -0.914484 - 0.466853I$	$1.59565 - 4.45381I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.641510 - 0.685847I$ $a = 1.23681 - 2.06522I$ $b = -0.914484 + 0.466853I$	$1.59565 + 4.45381I$	0
$u = -0.360440 + 0.851578I$ $a = -0.50460 - 1.61504I$ $b = 1.172380 + 0.647159I$	$2.56338 - 13.34790I$	0
$u = -0.360440 - 0.851578I$ $a = -0.50460 + 1.61504I$ $b = 1.172380 - 0.647159I$	$2.56338 + 13.34790I$	0
$u = 0.625840 + 0.664076I$ $a = -0.791932 + 1.017230I$ $b = 0.601541 - 0.717809I$	$3.57970 - 0.33630I$	0
$u = 0.625840 - 0.664076I$ $a = -0.791932 - 1.017230I$ $b = 0.601541 + 0.717809I$	$3.57970 + 0.33630I$	0
$u = 0.856038 + 0.688618I$ $a = -0.806317 + 0.319246I$ $b = 0.931389 - 0.556398I$	$2.11652 + 0.12357I$	0
$u = 0.856038 - 0.688618I$ $a = -0.806317 - 0.319246I$ $b = 0.931389 + 0.556398I$	$2.11652 - 0.12357I$	0
$u = -0.376878 + 0.812333I$ $a = -0.52210 + 1.47034I$ $b = 0.384441 - 0.938529I$	$4.96406 - 7.56007I$	0
$u = -0.376878 - 0.812333I$ $a = -0.52210 - 1.47034I$ $b = 0.384441 + 0.938529I$	$4.96406 + 7.56007I$	0
$u = 0.929102 + 0.614330I$ $a = 0.32412 - 1.61149I$ $b = 0.735604 + 0.656108I$	$2.70099 - 4.58722I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.929102 - 0.614330I$ $a = 0.32412 + 1.61149I$ $b = 0.735604 - 0.656108I$	$2.70099 + 4.58722I$	0
$u = -0.647947 + 0.601783I$ $a = 0.491987 + 0.959083I$ $b = -1.184760 - 0.061496I$	$0.56167 + 2.39825I$	0
$u = -0.647947 - 0.601783I$ $a = 0.491987 - 0.959083I$ $b = -1.184760 + 0.061496I$	$0.56167 - 2.39825I$	0
$u = -1.096790 + 0.239039I$ $a = 0.579659 + 0.176633I$ $b = 0.181527 - 0.700915I$	$-2.19767 + 0.09783I$	0
$u = -1.096790 - 0.239039I$ $a = 0.579659 - 0.176633I$ $b = 0.181527 + 0.700915I$	$-2.19767 - 0.09783I$	0
$u = -1.085900 + 0.300273I$ $a = 0.095938 - 0.869917I$ $b = -0.404365 + 0.636334I$	$-2.72819 + 0.51907I$	0
$u = -1.085900 - 0.300273I$ $a = 0.095938 + 0.869917I$ $b = -0.404365 - 0.636334I$	$-2.72819 - 0.51907I$	0
$u = 0.945433 + 0.613886I$ $a = 1.64606 - 0.57975I$ $b = -0.887017 + 0.379364I$	$0.703011 - 0.552903I$	0
$u = 0.945433 - 0.613886I$ $a = 1.64606 + 0.57975I$ $b = -0.887017 - 0.379364I$	$0.703011 + 0.552903I$	0
$u = 0.295128 + 0.818177I$ $a = -0.28206 + 1.45199I$ $b = 1.136500 - 0.604191I$	$-0.03017 + 7.80820I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.295128 - 0.818177I$ $a = -0.28206 - 1.45199I$ $b = 1.136500 + 0.604191I$	$-0.03017 - 7.80820I$	0
$u = 1.083660 + 0.331383I$ $a = 1.56052 - 0.49678I$ $b = 0.985997 - 0.543937I$	$1.63173 + 1.59811I$	0
$u = 1.083660 - 0.331383I$ $a = 1.56052 + 0.49678I$ $b = 0.985997 + 0.543937I$	$1.63173 - 1.59811I$	0
$u = 0.337218 + 0.784199I$ $a = 0.84119 - 1.93228I$ $b = -1.001370 + 0.579447I$	$0.02259 + 6.84914I$	$-4.00000 - 5.53784I$
$u = 0.337218 - 0.784199I$ $a = 0.84119 + 1.93228I$ $b = -1.001370 - 0.579447I$	$0.02259 - 6.84914I$	$-4.00000 + 5.53784I$
$u = 1.024480 + 0.520822I$ $a = -1.29521 + 3.21339I$ $b = -0.924258 - 0.397800I$	$0.53683 - 3.70519I$	0
$u = 1.024480 - 0.520822I$ $a = -1.29521 - 3.21339I$ $b = -0.924258 + 0.397800I$	$0.53683 + 3.70519I$	0
$u = 0.159327 + 0.831892I$ $a = -0.108112 - 0.299440I$ $b = 0.895825 + 0.313048I$	$-1.91184 + 1.48491I$	$-1.39304 + 3.17304I$
$u = 0.159327 - 0.831892I$ $a = -0.108112 + 0.299440I$ $b = 0.895825 - 0.313048I$	$-1.91184 - 1.48491I$	$-1.39304 - 3.17304I$
$u = -1.036320 + 0.520674I$ $a = -0.932067 - 0.350834I$ $b = 1.005970 + 0.821372I$	$4.37356 + 1.32673I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.036320-0.520674I$ $a=-0.932067+0.350834I$ $b=1.005970-0.821372I$	$4.37356-1.32673I$	0
$u=1.131370+0.259000I$ $a=-1.31602+0.87627I$ $b=-1.293990-0.230800I$	$-5.39528+1.34040I$	0
$u=1.131370-0.259000I$ $a=-1.31602-0.87627I$ $b=-1.293990+0.230800I$	$-5.39528-1.34040I$	0
$u=1.152310+0.164300I$ $a=0.308713-0.257488I$ $b=0.303735+0.886361I$	$-0.11437+4.94908I$	0
$u=1.152310-0.164300I$ $a=0.308713+0.257488I$ $b=0.303735-0.886361I$	$-0.11437-4.94908I$	0
$u=-1.144660+0.220579I$ $a=-0.527007+0.739685I$ $b=-1.070060-0.530939I$	$-4.68472-4.05873I$	0
$u=-1.144660-0.220579I$ $a=-0.527007-0.739685I$ $b=-1.070060+0.530939I$	$-4.68472+4.05873I$	0
$u=1.125110+0.318880I$ $a=-0.796915-0.375689I$ $b=-1.139860+0.425704I$	$-6.05694-1.08573I$	0
$u=1.125110-0.318880I$ $a=-0.796915+0.375689I$ $b=-1.139860-0.425704I$	$-6.05694+1.08573I$	0
$u=0.343158+0.749318I$ $a=-0.410013-1.181650I$ $b=0.369198+0.821187I$	$2.25260+2.49043I$	$-0.905133-0.809498I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.343158 - 0.749318I$ $a = -0.410013 + 1.181650I$ $b = 0.369198 - 0.821187I$	$2.25260 - 2.49043I$	$-0.905133 + 0.809498I$
$u = -1.083540 + 0.462798I$ $a = 1.098280 + 0.386628I$ $b = -0.404462 - 0.613245I$	$-2.75739 + 2.11013I$	0
$u = -1.083540 - 0.462798I$ $a = 1.098280 - 0.386628I$ $b = -0.404462 + 0.613245I$	$-2.75739 - 2.11013I$	0
$u = -0.011622 + 0.818174I$ $a = -0.074123 + 0.544809I$ $b = 0.995714 - 0.406105I$	$-2.57787 + 4.21955I$	$-4.17622 - 7.27467I$
$u = -0.011622 - 0.818174I$ $a = -0.074123 - 0.544809I$ $b = 0.995714 + 0.406105I$	$-2.57787 - 4.21955I$	$-4.17622 + 7.27467I$
$u = -1.129070 + 0.361697I$ $a = -1.34802 - 1.42487I$ $b = -1.224270 + 0.331092I$	$-6.29679 + 3.76078I$	0
$u = -1.129070 - 0.361697I$ $a = -1.34802 + 1.42487I$ $b = -1.224270 - 0.331092I$	$-6.29679 - 3.76078I$	0
$u = 1.111690 + 0.415080I$ $a = -0.116457 + 0.565379I$ $b = -0.129765 - 0.688851I$	$-3.02776 - 5.24088I$	0
$u = 1.111690 - 0.415080I$ $a = -0.116457 - 0.565379I$ $b = -0.129765 + 0.688851I$	$-3.02776 + 5.24088I$	0
$u = -0.312510 + 0.749288I$ $a = 0.559212 - 0.401507I$ $b = -1.315870 + 0.147932I$	$-1.00364 - 4.19450I$	$-1.63745 + 4.51933I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.312510-0.749288I$ $a=\ \ 0.559212+0.401507I$ $b=-1.315870-0.147932I$	$-1.00364+4.19450I$	$-1.63745-4.51933I$
$u=-0.995453+0.653553I$ $a=\ \ 0.58402+1.61417I$ $b=\ \ 0.491466-0.765613I$	$5.11240+0.75650I$	0
$u=-0.995453-0.653553I$ $a=\ \ 0.58402-1.61417I$ $b=\ \ 0.491466+0.765613I$	$5.11240-0.75650I$	0
$u=-0.969402+0.693350I$ $a=-0.916161-0.259688I$ $b=\ \ 1.069190+0.616970I$	$3.39225-4.47700I$	0
$u=-0.969402-0.693350I$ $a=-0.916161+0.259688I$ $b=\ \ 1.069190-0.616970I$	$3.39225+4.47700I$	0
$u=-1.057870+0.551283I$ $a=\ \ 0.47108+1.74711I$ $b=\ \ 0.731815-0.928127I$	$5.19967+7.70446I$	0
$u=-1.057870-0.551283I$ $a=\ \ 0.47108-1.74711I$ $b=\ \ 0.731815+0.928127I$	$5.19967-7.70446I$	0
$u=-0.428230+0.678042I$ $a=-0.929528+0.869416I$ $b=\ \ 0.547873-0.796971I$	$6.80456+1.11989I$	$3.86206-1.92549I$
$u=-0.428230-0.678042I$ $a=-0.929528-0.869416I$ $b=\ \ 0.547873+0.796971I$	$6.80456-1.11989I$	$3.86206+1.92549I$
$u=-0.456083+0.647815I$ $a=-1.28709-1.39873I$ $b=\ \ 0.685091+0.880776I$	$6.96717-3.00924I$	$3.32571+3.86128I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.456083-0.647815I$ $a=-1.28709+1.39873I$ $b=\ 0.685091-0.880776I$	$6.96717+3.00924I$	$3.32571-3.86128I$
$u=-1.069980+0.563935I$ $a=-1.177620+0.292673I$ $b=\ 0.458506+0.776663I$	$4.93200+3.69354I$	0
$u=-1.069980-0.563935I$ $a=-1.177620-0.292673I$ $b=\ 0.458506-0.776663I$	$4.93200-3.69354I$	0
$u=\ 1.207800+0.171412I$ $a=\ 0.911181+0.392146I$ $b=\ 1.173710-0.603350I$	$-2.71725+10.40630I$	0
$u=\ 1.207800-0.171412I$ $a=\ 0.911181-0.392146I$ $b=\ 1.173710+0.603350I$	$-2.71725-10.40630I$	0
$u=-1.197460+0.242666I$ $a=\ 0.977541-0.101848I$ $b=\ 1.135970+0.538413I$	$-4.81427-4.59663I$	0
$u=-1.197460-0.242666I$ $a=\ 0.977541+0.101848I$ $b=\ 1.135970-0.538413I$	$-4.81427+4.59663I$	0
$u=\ 1.117630+0.498461I$ $a=-0.676563+0.843967I$ $b=-1.289970+0.221714I$	$-5.37815-3.93838I$	0
$u=\ 1.117630-0.498461I$ $a=-0.676563-0.843967I$ $b=-1.289970-0.221714I$	$-5.37815+3.93838I$	0
$u=-1.106580+0.533705I$ $a=\ 1.73174+2.09378I$ $b=\ 1.088060-0.612065I$	$3.05788+8.93644I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.106580-0.533705I$ $a=\ 1.73174-2.09378I$ $b=\ 1.088060+0.612065I$	$3.05788-8.93644I$	0
$u=\ 0.522112+0.567423I$ $a=\ 0.77915-2.60115I$ $b=-0.790674+0.435695I$	$2.02977-0.67823I$	$-0.099465-0.605003I$
$u=\ 0.522112-0.567423I$ $a=\ 0.77915+2.60115I$ $b=-0.790674-0.435695I$	$2.02977+0.67823I$	$-0.099465+0.605003I$
$u=\ 1.108190+0.543946I$ $a=\ 1.227840-0.550209I$ $b=-0.602852+0.701433I$	$-1.05039-6.85477I$	0
$u=\ 1.108190-0.543946I$ $a=\ 1.227840+0.550209I$ $b=-0.602852-0.701433I$	$-1.05039+6.85477I$	0
$u=-1.122840+0.527715I$ $a=-0.83912-2.37057I$ $b=-1.058380+0.532287I$	$-4.63903+6.62698I$	0
$u=-1.122840-0.527715I$ $a=-0.83912+2.37057I$ $b=-1.058380-0.532287I$	$-4.63903-6.62698I$	0
$u=\ 0.328399+0.681742I$ $a=\ 1.11325+1.84748I$ $b=-0.613102-0.608545I$	$1.20068+2.11842I$	$-0.620669-1.025539I$
$u=\ 0.328399-0.681742I$ $a=\ 1.11325-1.84748I$ $b=-0.613102+0.608545I$	$1.20068-2.11842I$	$-0.620669+1.025539I$
$u=\ 1.119650+0.565015I$ $a=-1.018000+0.273402I$ $b=\ 0.321102-0.890173I$	$-0.02760-7.46593I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.119650 - 0.565015I$ $a = -1.018000 - 0.273402I$ $b = 0.321102 + 0.890173I$	$-0.02760 + 7.46593I$	0
$u = -0.490425 + 0.555946I$ $a = -0.38404 + 2.53300I$ $b = 1.010330 - 0.762032I$	$5.98724 + 3.04019I$	$2.02455 - 0.66536I$
$u = -0.490425 - 0.555946I$ $a = -0.38404 - 2.53300I$ $b = 1.010330 + 0.762032I$	$5.98724 - 3.04019I$	$2.02455 + 0.66536I$
$u = -1.128360 + 0.558169I$ $a = -0.317718 - 1.111580I$ $b = -1.359020 - 0.159273I$	$-3.38814 + 9.13602I$	0
$u = -1.128360 - 0.558169I$ $a = -0.317718 + 1.111580I$ $b = -1.359020 + 0.159273I$	$-3.38814 - 9.13602I$	0
$u = -1.218150 + 0.345028I$ $a = 1.132930 + 0.520998I$ $b = 0.988137 - 0.326146I$	$-6.19060 + 2.43557I$	0
$u = -1.218150 - 0.345028I$ $a = 1.132930 - 0.520998I$ $b = 0.988137 + 0.326146I$	$-6.19060 - 2.43557I$	0
$u = 1.132190 + 0.575320I$ $a = -0.56953 + 2.43706I$ $b = -1.022680 - 0.616427I$	$-2.32672 - 11.95030I$	0
$u = 1.132190 - 0.575320I$ $a = -0.56953 - 2.43706I$ $b = -1.022680 + 0.616427I$	$-2.32672 + 11.95030I$	0
$u = -0.253345 + 0.682209I$ $a = 0.56522 + 1.88543I$ $b = -1.018930 - 0.461258I$	$-2.16964 - 1.98512I$	$-6.10108 + 1.31187I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.253345-0.682209I$ $a=\ 0.56522-1.88543I$ $b=-1.018930+0.461258I$	$-2.16964+1.98512I$	$-6.10108-1.31187I$
$u=-0.318883+0.652354I$ $a=\ 0.36035-1.78015I$ $b=\ 1.043930+0.648718I$	$5.31934-4.30409I$	$1.26144+3.66893I$
$u=-0.318883-0.652354I$ $a=\ 0.36035+1.78015I$ $b=\ 1.043930-0.648718I$	$5.31934+4.30409I$	$1.26144-3.66893I$
$u=-1.128960+0.597098I$ $a=-1.228480-0.443864I$ $b=\ 0.370224+0.977413I$	$2.72103+12.82500I$	0
$u=-1.128960-0.597098I$ $a=-1.228480+0.443864I$ $b=\ 0.370224-0.977413I$	$2.72103-12.82500I$	0
$u=\ 1.208150+0.425593I$ $a=\ 1.20203-0.92309I$ $b=\ 1.074360+0.404536I$	$-6.27164-8.60793I$	0
$u=\ 1.208150-0.425593I$ $a=\ 1.20203+0.92309I$ $b=\ 1.074360-0.404536I$	$-6.27164+8.60793I$	0
$u=-1.204540+0.443650I$ $a=\ 0.649828+0.613430I$ $b=\ 0.981597+0.323728I$	$-6.15922+0.24928I$	0
$u=-1.204540-0.443650I$ $a=\ 0.649828-0.613430I$ $b=\ 0.981597-0.323728I$	$-6.15922-0.24928I$	0
$u=\ 1.154830+0.571926I$ $a=\ 1.10233-2.07234I$ $b=\ 1.172180+0.610271I$	$-2.58180-12.96900I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.154830 - 0.571926I$ $a = 1.10233 + 2.07234I$ $b = 1.172180 - 0.610271I$	$-2.58180 + 12.96900I$	0
$u = -0.599739 + 0.377924I$ $a = 1.15835 - 1.88965I$ $b = -0.710203 + 0.336718I$	$-0.90824 + 1.35117I$	$-6.39675 - 4.84265I$
$u = -0.599739 - 0.377924I$ $a = 1.15835 + 1.88965I$ $b = -0.710203 - 0.336718I$	$-0.90824 - 1.35117I$	$-6.39675 + 4.84265I$
$u = -1.148170 + 0.605188I$ $a = 0.92041 + 2.29620I$ $b = 1.192770 - 0.653972I$	$0.1985 + 18.7424I$	0
$u = -1.148170 - 0.605188I$ $a = 0.92041 - 2.29620I$ $b = 1.192770 + 0.653972I$	$0.1985 - 18.7424I$	0
$u = 1.194740 + 0.518740I$ $a = 0.468319 - 0.708809I$ $b = 0.899742 - 0.240840I$	$-5.00169 - 6.42010I$	0
$u = 1.194740 - 0.518740I$ $a = 0.468319 + 0.708809I$ $b = 0.899742 + 0.240840I$	$-5.00169 + 6.42010I$	0
$u = 0.153844 + 0.624412I$ $a = 0.155142 + 0.840811I$ $b = -1.195540 - 0.217927I$	$-2.77912 - 0.38414I$	$-5.60194 - 0.58668I$
$u = 0.153844 - 0.624412I$ $a = 0.155142 - 0.840811I$ $b = -1.195540 + 0.217927I$	$-2.77912 + 0.38414I$	$-5.60194 + 0.58668I$
$u = 0.039096 + 0.550554I$ $a = 0.922121 - 1.064520I$ $b = -0.157515 + 0.448845I$	$-0.10731 + 1.54447I$	$-1.37631 - 4.72080I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 0.039096 - 0.550554I$ $a = \quad 0.922121 + 1.064520I$ $b = -0.157515 - 0.448845I$	$-0.10731 - 1.54447I$	$-1.37631 + 4.72080I$
$u = \quad 0.539309$ $a = -1.30564$ $b = -1.12306$	-2.25551	-0.524520

II.

$\boldsymbol{I_2^u = \langle b+1,\ 2u^8+u^7+\cdots+a-2,\ u^9+u^8-2u^7-3u^6+u^5+3u^4+2u^3-u-1\rangle}$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -2u^8 - u^7 + 5u^6 + 3u^5 - 4u^4 - 3u^3 - 2u^2 + 2 \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -2u^8 - u^7 + 5u^6 + 3u^5 - 4u^4 - 3u^3 - 2u^2 + 1 \\ -1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -2u^8 - u^7 + 5u^6 + 3u^5 - 4u^4 - 3u^3 - 2u^2 + 2 \\ -1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^6 - u^4 + 1 \\ u^8 - 2u^6 + 2u^4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -6u^8 - 3u^7 + 10u^6 + 8u^5 - 2u^4 - 8u^3 - 12u^2 - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2	$(u-1)^9$
c_3, c_8	u^9
c_4	$(u+1)^9$
c_5	$u^9+u^8-2u^7-3u^6+u^5+3u^4+2u^3-u-1$
c_6, c_{11}	$u^9+3u^8+8u^7+13u^6+17u^5+17u^4+12u^3+6u^2+u-1$
c_7	$u^9+u^8+2u^7+u^6+3u^5+u^4+2u^3+u-1$
c_9	$u^9-5u^8+12u^7-15u^6+9u^5+u^4-4u^3+2u^2+u-1$
c_{10}	$u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1$
c_{12}	$u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4	$(y-1)^9$
c_3, c_8	y^9
c_5, c_{10}	$y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1$
c_6, c_{11}	$y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1$
c_7, c_{12}	$y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1$
c_9	$y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.772920+0.510351I$ $a=\ \ 1.67861+2.31573I$ $b=-1.00000$	$0.13850+2.09337I$	$-11.64247+5.88316I$
$u=-0.772920-0.510351I$ $a=\ \ 1.67861-2.31573I$ $b=-1.00000$	$0.13850-2.09337I$	$-11.64247-5.88316I$
$u=\ \ 0.825933$ $a=-0.871015$ $b=-1.00000$	-2.84338	-15.4610
$u=\ \ 1.173910+0.391555I$ $a=-0.893484+0.630694I$ $b=-1.00000$	$-6.01628-1.33617I$	$-7.94914+0.75351I$
$u=\ \ 1.173910-0.391555I$ $a=-0.893484-0.630694I$ $b=-1.00000$	$-6.01628+1.33617I$	$-7.94914-0.75351I$
$u=-0.141484+0.739668I$ $a=\ \ 0.309843+0.043204I$ $b=-1.00000$	$-2.26187-2.45442I$	$-4.75622+3.91612I$
$u=-0.141484-0.739668I$ $a=\ \ 0.309843-0.043204I$ $b=-1.00000$	$-2.26187+2.45442I$	$-4.75622-3.91612I$
$u=-1.172470+0.500383I$ $a=-0.659464-0.874093I$ $b=-1.00000$	$-5.24306+7.08493I$	$-7.92182-8.89461I$
$u=-1.172470-0.500383I$ $a=-0.659464+0.874093I$ $b=-1.00000$	$-5.24306-7.08493I$	$-7.92182+8.89461I$

III.

$\boldsymbol{I_3^u = \langle 6u^3a^2 - 2u^3a + \cdots + 26a - 4,\ -5u^3a - 2u^3 + \cdots - 2a^2 + a,\ u^4 - u^2 + 1\rangle}$

(i) Arc colorings

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

$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} a \\ -0.260870a^2u^3 + 0.0869565au^3 + \cdots - 1.13043a + 0.173913 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.260870a^2u^3 + 0.0869565au^3 + \cdots - 0.130435a + 0.173913 \\ -0.260870a^2u^3 + 0.0869565au^3 + \cdots - 1.13043a + 0.173913 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.0869565a^2u^3 - 0.173913au^3 + \cdots - 0.347826a - 0.0434783 \\ -0.173913a^2u^3 - 0.608696au^3 + \cdots - 0.0869565a + 0.782609 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.130435a^2u^3 - 0.478261au^3 + \cdots + 0.391304a + 0.956522 \\ 0.0869565a^2u^3 - 0.695652au^3 + \cdots + 1.04348a - 0.391304 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^3 \\ 0 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -0.391304a^2u^3 - 0.0869565au^3 + \cdots - 0.782609a - 0.217391 \\ 0.434783au^3 - 0.739130u^3 + \cdots + 0.173913a + 0.956522 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.0869565a^2u^3 - 0.173913au^3 + \cdots - 0.347826a - 0.0434783 \\ -0.173913a^2u^3 - 0.608696au^3 + \cdots - 0.0869565a + 0.782609 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes

$$= -\frac{24}{23}u^3a^2 + \frac{8}{23}a^2u^2 + \frac{8}{23}u^3a + \frac{12}{23}a^2u + \frac{44}{23}u^2a - \frac{36}{23}u^3 - \frac{8}{23}a^2 + \frac{16}{23}au + \frac{40}{23}u^2 - \frac{104}{23}a + \frac{76}{23}u - \frac{76}{23}$$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.866025 + 0.500000I$ $a = 0.340177 - 1.221410I$ $b = 0.877439 + 0.744862I$	$4.66906 - 4.85801I$	$1.50976 + 6.44355I$
$u = 0.866025 + 0.500000I$ $a = -0.387682 + 0.039280I$ $b = 0.877439 - 0.744862I$	$4.66906 + 0.79824I$	$1.50976 + 0.48465I$
$u = 0.866025 + 0.500000I$ $a = 4.14558 + 1.81610I$ $b = -0.754878$	$0.53148 - 2.02988I$	$-5.01951 + 3.46410I$
$u = 0.866025 - 0.500000I$ $a = 0.340177 + 1.221410I$ $b = 0.877439 - 0.744862I$	$4.66906 + 4.85801I$	$1.50976 - 6.44355I$
$u = 0.866025 - 0.500000I$ $a = -0.387682 - 0.039280I$ $b = 0.877439 + 0.744862I$	$4.66906 - 0.79824I$	$1.50976 - 0.48465I$
$u = 0.866025 - 0.500000I$ $a = 4.14558 - 1.81610I$ $b = -0.754878$	$0.53148 + 2.02988I$	$-5.01951 - 3.46410I$
$u = -0.866025 + 0.500000I$ $a = 0.119052 + 0.508616I$ $b = -0.754878$	$0.53148 + 2.02988I$	$-5.01951 - 3.46410I$
$u = -0.866025 + 0.500000I$ $a = -1.53477 - 0.67554I$ $b = 0.877439 + 0.744862I$	$4.66906 - 0.79824I$	$1.50976 - 0.48465I$
$u = -0.866025 + 0.500000I$ $a = 0.31765 + 2.53295I$ $b = 0.877439 - 0.744862I$	$4.66906 + 4.85801I$	$1.50976 - 6.44355I$
$u = -0.866025 - 0.500000I$ $a = 0.119052 - 0.508616I$ $b = -0.754878$	$0.53148 - 2.02988I$	$-5.01951 + 3.46410I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.866025-0.500000I$ $a=-1.53477+0.67554I$ $b=\ \ 0.877439-0.744862I$	$4.66906+0.79824I$	$1.50976+0.48465I$
$u=-0.866025-0.500000I$ $a=\ \ 0.31765-2.53295I$ $b=\ \ 0.877439+0.744862I$	$4.66906-4.85801I$	$1.50976+6.44355I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^9)(u^3-u^2+2u-1)^4(u^{132}+62u^{131}+\cdots+657u+1)$
c_2	$((u-1)^9)(u^3+u^2-1)^4(u^{132}-14u^{131}+\cdots+57u-1)$
c_3, c_8	$u^9(u^6-3u^4+2u^2+1)^2(u^{132}+u^{131}+\cdots-1024u+512)$
c_4	$((u+1)^9)(u^3-u^2+1)^4(u^{132}-14u^{131}+\cdots+57u-1)$
c_5	$(u^4-u^2+1)^3(u^9+u^8-2u^7-3u^6+u^5+3u^4+2u^3-u-1)$ $\cdot(u^{132}+2u^{131}+\cdots-19u-17)$
c_6	$(u^4-u^2+1)^3$ $\cdot(u^9+3u^8+8u^7+13u^6+17u^5+17u^4+12u^3+6u^2+u-1)$ $\cdot(u^{132}+6u^{131}+\cdots-19963915u-1325201)$
c_7	$(u^2+1)^6(u^9+u^8+2u^7+u^6+3u^5+u^4+2u^3+u-1)$ $\cdot(u^{132}+2u^{131}+\cdots-273u-49)$
c_9	$((u^2-u+1)^6)(u^9-5u^8+\cdots+u-1)$ $\cdot(u^{132}+64u^{131}+\cdots+2163u+289)$
c_{10}	$(u^4-u^2+1)^3(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)$ $\cdot(u^{132}+2u^{131}+\cdots-19u-17)$
c_{11}	$((u+1)^{12})(u^9+3u^8+\cdots+u-1)$ $\cdot(u^{132}-66u^{131}+\cdots+6125u+2401)$
c_{12}	$(u^2+1)^6(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)$ $\cdot(u^{132}+2u^{131}+\cdots-273u-49)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^9)(y^3+3y^2+2y-1)^4(y^{132}+30y^{131}+\cdots+816247y+1)$
c_2, c_4	$((y-1)^9)(y^3-y^2+2y-1)^4(y^{132}-62y^{131}+\cdots-657y+1)$
c_3, c_8	$y^9(y^3-3y^2+2y+1)^4(y^{132}-69y^{131}+\cdots-2.12337\times10^7y+262144)$
c_5, c_{10}	$((y^2-y+1)^6)(y^9-5y^8+\cdots+y-1)$ $\cdot(y^{132}-64y^{131}+\cdots-2163y+289)$
c_6	$((y^2-y+1)^6)(y^9+7y^8+\cdots+13y-1)$ $\cdot(y^{132}+32y^{131}+\cdots-307315706207635y+1756157690401)$
c_7, c_{12}	$((y+1)^{12})(y^9+3y^8+\cdots+y-1)$ $\cdot(y^{132}+66y^{131}+\cdots-6125y+2401)$
c_9	$(y^2+y+1)^6(y^9-y^8+12y^7-7y^6+37y^5+y^4-10y^2+5y-1)$ $\cdot(y^{132}+16y^{131}+\cdots-345303y+83521)$
c_{11}	$(y-1)^{12}(y^9+7y^8+20y^7+25y^6+5y^5-15y^4+22y^2+13y-1)$ $\cdot(y^{132}+14y^{131}+\cdots-531353305y+5764801)$