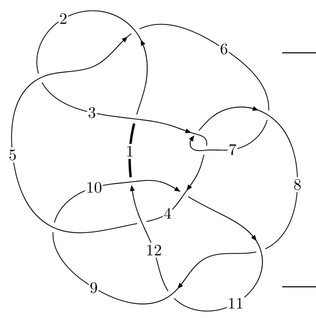
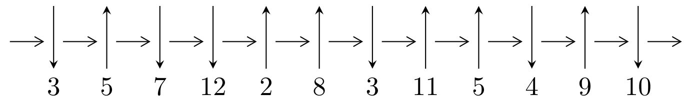
$12n_{0421}$ ($K12n_{0421}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & 6.94451 \times 10^{73} u^{53} - 1.34116 \times 10^{74} u^{52} + \cdots + 3.81141 \times 10^{75} b - 1.25088 \times 10^{75}, \\
& - 3.43142 \times 10^{75} u^{53} + 7.05210 \times 10^{75} u^{52} + \cdots + 3.23970 \times 10^{76} a + 1.89860 \times 10^{77}, \\
& u^{54} - 2u^{53} + \cdots - 112u + 17 \rangle \\
I_2^u = \langle & -44u^{17} + 4u^{16} + \cdots + 69b + 127u,\ -44u^{17} - 264u^{15} + \cdots + 69a - 224,\ u^{18} + 6u^{16} + \cdots + 3u + 1 \rangle \\
I_3^u = \langle & a^4 - a^3 u + 2a^2 - au + b - u + 2,\ a^5 - a^4 + 2a^3 - a^2 + a - 1,\ u^2 + 1 \rangle \\
I_4^u = \langle & -3u^3 + 6u^2 + 4b - 5u + 1,\ u^3 + 2a - u + 3,\ u^4 - u^3 + u^2 + 1 \rangle
\end{aligned}$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 86 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. $\boldsymbol{I_1^u = \langle 6.94 \times 10^{73} u^{53} - 1.34 \times 10^{74} u^{52} + \cdots + 3.81 \times 10^{75} b - 1.25 \times 10^{75},\ -3.43 \times 10^{75} u^{53} + 7.05 \times 10^{75} u^{52} + \cdots + 3.24 \times 10^{76} a + 1.90 \times 10^{77},\ u^{54} - 2u^{53} + \cdots - 112u + 17\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2+1 \\ u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.105918u^{53} - 0.217677u^{52} + \cdots + 63.2432u - 5.86042 \\ -0.0182203u^{53} + 0.0351879u^{52} + \cdots - 10.1732u + 0.328192 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.105918u^{53} - 0.217677u^{52} + \cdots + 63.2432u - 5.86042 \\ -0.0293505u^{53} + 0.0578164u^{52} + \cdots - 12.6281u + 0.427504 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.0377580u^{53} + 0.0561954u^{52} + \cdots + 17.7971u - 6.35371 \\ -0.0210496u^{53} + 0.0288416u^{52} + \cdots - 9.16703u + 1.99686 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0.0736388u^{53} - 0.109834u^{52} + \cdots + 5.97498u + 3.87914 \\ -0.00164042u^{53} + 0.00683312u^{52} + \cdots - 1.67223u - 0.577146 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.0157800u^{53} - 0.0231466u^{52} + \cdots + 29.3692u - 3.16089 \\ -0.0328608u^{53} + 0.0646084u^{52} + \cdots - 11.4634u + 0.980987 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.0000582809u^{53} + 0.00965479u^{52} + \cdots + 26.4948u - 4.19485 \\ -0.0248738u^{53} + 0.0481071u^{52} + \cdots - 11.7942u + 1.11363 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.0248155u^{53} + 0.0577619u^{52} + \cdots + 14.7006u - 3.08122 \\ -0.0248738u^{53} + 0.0481071u^{52} + \cdots - 11.7942u + 1.11363 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 - u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.0961909u^{53} - 0.214297u^{52} + \cdots + 61.1959u + 0.495059$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{54} + 60u^{53} + \cdots + 17614u + 289$
c_2, c_5	$u^{54} + 2u^{53} + \cdots + 112u + 17$
c_3, c_7	$u^{54} + 2u^{53} + \cdots + 20u + 17$
c_4	$u^{54} - 7u^{53} + \cdots - 8u + 4$
c_6	$u^{54} - 20u^{53} + \cdots - 15886u + 289$
c_8, c_{11}	$u^{54} + 4u^{53} + \cdots + 481u + 16$
c_9	$2(2u^{54} + 11u^{53} + \cdots + 27633u + 3982)$
c_{10}	$2(2u^{54} + 3u^{53} + \cdots - 26787u + 17894)$
c_{12}	$u^{54} - 8u^{53} + \cdots - 2976u + 256$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{54} - 120y^{53} + \cdots - 34842354y + 83521$
c_2, c_5	$y^{54} + 60y^{53} + \cdots + 17614y + 289$
c_3, c_7	$y^{54} + 20y^{53} + \cdots + 15886y + 289$
c_4	$y^{54} + 17y^{53} + \cdots + 152y + 16$
c_6	$y^{54} + 40y^{53} + \cdots - 35600546y + 83521$
c_8, c_{11}	$y^{54} - 32y^{53} + \cdots - 95457y + 256$
c_9	$4(4y^{54} - 173y^{53} + \cdots + 1.70212 \times 10^{8}y + 1.58563 \times 10^{7})$
c_{10}	$4(4y^{54} - 205y^{53} + \cdots + 5.53025 \times 10^{9}y + 3.20195 \times 10^{8})$
c_{12}	$y^{54} - 12y^{53} + \cdots - 1545216y + 65536$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.957433+0.281564I$ $a=-0.366782+0.368685I$ $b=-0.536027-0.041780I$	$0.08167-4.27758I$	$0.+6.47467I$
$u=-0.957433-0.281564I$ $a=-0.366782-0.368685I$ $b=-0.536027+0.041780I$	$0.08167+4.27758I$	$0.-6.47467I$
$u=\ \ 0.793853+0.517771I$ $a=-0.989605-0.419229I$ $b=-0.745351+0.352281I$	$-1.69843+5.87991I$	$-0.83203-7.69197I$
$u=\ \ 0.793853-0.517771I$ $a=-0.989605+0.419229I$ $b=-0.745351-0.352281I$	$-1.69843-5.87991I$	$-0.83203+7.69197I$
$u=\ \ 1.013690+0.409819I$ $a=\ \ 1.40509+0.61654I$ $b=\ \ 1.023680-0.012588I$	$1.51017+11.89510I$	$0.-8.55352I$
$u=\ \ 1.013690-0.409819I$ $a=\ \ 1.40509-0.61654I$ $b=\ \ 1.023680+0.012588I$	$1.51017-11.89510I$	$0.+8.55352I$
$u=\ \ 0.037687+0.876774I$ $a=-0.411613-0.841558I$ $b=-0.730721-0.454623I$	$-1.21558-1.50306I$	$-6.28567+3.87694I$
$u=\ \ 0.037687-0.876774I$ $a=-0.411613+0.841558I$ $b=-0.730721+0.454623I$	$-1.21558+1.50306I$	$-6.28567-3.87694I$
$u=\ \ 0.001197+1.155080I$ $a=\ \ 0.344466+1.134660I$ $b=\ \ 0.086158+0.503268I$	$4.74660-4.32144I$	0
$u=\ \ 0.001197-1.155080I$ $a=\ \ 0.344466-1.134660I$ $b=\ \ 0.086158-0.503268I$	$4.74660+4.32144I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.904014+0.749313I$ $a=\ \ 0.409227-0.949421I$ $b=\ \ 0.254579-0.478630I$	$-0.351082-0.581835I$	0
$u=-0.904014-0.749313I$ $a=\ \ 0.409227+0.949421I$ $b=\ \ 0.254579+0.478630I$	$-0.351082+0.581835I$	0
$u=-0.409754+0.654267I$ $a=\ \ 0.670688-0.470147I$ $b=\ \ 0.024664-0.332222I$	$-0.11724-1.46636I$	$-1.51920+4.74355I$
$u=-0.409754-0.654267I$ $a=\ \ 0.670688+0.470147I$ $b=\ \ 0.024664+0.332222I$	$-0.11724+1.46636I$	$-1.51920-4.74355I$
$u=\ \ 0.897207+0.878746I$ $a=\ \ 0.412964+0.196074I$ $b=\ \ 0.230506+0.127637I$	$8.36051+3.29219I$	0
$u=\ \ 0.897207-0.878746I$ $a=\ \ 0.412964-0.196074I$ $b=\ \ 0.230506-0.127637I$	$8.36051-3.29219I$	0
$u=\ \ 0.611149+0.347151I$ $a=\ \ 1.350850-0.353105I$ $b=\ \ 1.28376+1.02238I$	$3.32384+4.22762I$	$7.57484-8.95989I$
$u=\ \ 0.611149-0.347151I$ $a=\ \ 1.350850+0.353105I$ $b=\ \ 1.28376-1.02238I$	$3.32384-4.22762I$	$7.57484+8.95989I$
$u=-0.483135+0.456682I$ $a=-2.56114-3.18734I$ $b=-1.88415+0.56985I$	$1.86209-1.74879I$	$7.3853-15.6719I$
$u=-0.483135-0.456682I$ $a=-2.56114+3.18734I$ $b=-1.88415-0.56985I$	$1.86209+1.74879I$	$7.3853+15.6719I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.246711+0.521269I$ $a=2.52817+2.38441I$ $b=0.71366-1.77517I$	$1.60277-1.13073I$	$16.4890+3.6045I$
$u=-0.246711-0.521269I$ $a=2.52817-2.38441I$ $b=0.71366+1.77517I$	$1.60277+1.13073I$	$16.4890-3.6045I$
$u=0.10747+1.43757I$ $a=-0.231658+0.116000I$ $b=-2.40283-0.09567I$	$-1.12918+2.68232I$	0
$u=0.10747-1.43757I$ $a=-0.231658-0.116000I$ $b=-2.40283+0.09567I$	$-1.12918-2.68232I$	0
$u=-0.00780+1.45535I$ $a=-0.234240-0.821894I$ $b=-0.634589+0.224881I$	$-3.51163-1.45830I$	0
$u=-0.00780-1.45535I$ $a=-0.234240+0.821894I$ $b=-0.634589-0.224881I$	$-3.51163+1.45830I$	0
$u=0.19633+1.47266I$ $a=-0.180761+0.764063I$ $b=-0.450752-0.458790I$	$-2.64331+7.12189I$	0
$u=0.19633-1.47266I$ $a=-0.180761-0.764063I$ $b=-0.450752+0.458790I$	$-2.64331-7.12189I$	0
$u=-0.04819+1.51041I$ $a=0.39189-1.67295I$ $b=0.87803-2.40931I$	$-5.05765-2.00436I$	0
$u=-0.04819-1.51041I$ $a=0.39189+1.67295I$ $b=0.87803+2.40931I$	$-5.05765+2.00436I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.14469 + 1.50993I$ $a = 0.47360 + 1.91984I$ $b = 1.53856 + 2.59401I$	$-4.66611 - 3.99543I$	0
$u = -0.14469 - 1.50993I$ $a = 0.47360 - 1.91984I$ $b = 1.53856 - 2.59401I$	$-4.66611 + 3.99543I$	0
$u = 0.416507 + 0.239610I$ $a = 0.373760 - 0.682809I$ $b = 1.212780 - 0.597298I$	$4.35238 + 0.88122I$	$11.36984 - 2.33709I$
$u = 0.416507 - 0.239610I$ $a = 0.373760 + 0.682809I$ $b = 1.212780 + 0.597298I$	$4.35238 - 0.88122I$	$11.36984 + 2.33709I$
$u = 0.076348 + 0.449359I$ $a = 1.54451 - 2.17798I$ $b = 0.371098 - 0.688121I$	$7.12845 + 4.50045I$	$11.43251 - 4.54345I$
$u = 0.076348 - 0.449359I$ $a = 1.54451 + 2.17798I$ $b = 0.371098 + 0.688121I$	$7.12845 - 4.50045I$	$11.43251 + 4.54345I$
$u = -0.40434 + 1.49345I$ $a = 0.473577 + 0.252036I$ $b = 1.54220 - 0.04301I$	$-5.61605 - 9.26553I$	0
$u = -0.40434 - 1.49345I$ $a = 0.473577 - 0.252036I$ $b = 1.54220 + 0.04301I$	$-5.61605 + 9.26553I$	0
$u = 0.30238 + 1.53005I$ $a = 0.508036 - 0.093774I$ $b = 1.60740 + 0.32922I$	$-8.31392 + 2.90879I$	0
$u = 0.30238 - 1.53005I$ $a = 0.508036 + 0.093774I$ $b = 1.60740 - 0.32922I$	$-8.31392 - 2.90879I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.27909 + 1.54859I$ $a = 0.761075 - 0.328934I$ $b = 2.56556 - 0.27826I$	$-8.47521 + 9.84153I$	0
$u = 0.27909 - 1.54859I$ $a = 0.761075 + 0.328934I$ $b = 2.56556 + 0.27826I$	$-8.47521 - 9.84153I$	0
$u = 0.39619 + 1.53466I$ $a = -0.989911 + 0.661170I$ $b = -2.69175 + 0.38369I$	$-4.7262 + 17.0140I$	0
$u = 0.39619 - 1.53466I$ $a = -0.989911 - 0.661170I$ $b = -2.69175 - 0.38369I$	$-4.7262 - 17.0140I$	0
$u = -0.13238 + 1.58588I$ $a = 0.710747 + 0.251585I$ $b = 2.39257 + 0.46175I$	$-10.02230 - 3.29278I$	0
$u = -0.13238 - 1.58588I$ $a = 0.710747 - 0.251585I$ $b = 2.39257 - 0.46175I$	$-10.02230 + 3.29278I$	0
$u = -0.23845 + 1.60519I$ $a = -1.019030 - 0.001725I$ $b = -2.17248 + 0.26878I$	$-8.27340 - 4.54754I$	0
$u = -0.23845 - 1.60519I$ $a = -1.019030 + 0.001725I$ $b = -2.17248 - 0.26878I$	$-8.27340 + 4.54754I$	0
$u = -0.30330 + 1.60247I$ $a = -0.977488 - 0.584250I$ $b = -2.55816 - 0.50781I$	$-7.29392 - 10.27410I$	0
$u = -0.30330 - 1.60247I$ $a = -0.977488 + 0.584250I$ $b = -2.55816 + 0.50781I$	$-7.29392 + 10.27410I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.09043 + 1.66784I$ $a = -0.977056 - 0.182021I$ $b = -2.14804 - 0.39830I$	$-9.44818 - 2.46020I$	0
$u = 0.09043 - 1.66784I$ $a = -0.977056 + 0.182021I$ $b = -2.14804 + 0.39830I$	$-9.44818 + 2.46020I$	0
$u = 0.060670 + 0.183744I$ $a = 0.36004 + 5.05217I$ $b = -0.395346 - 1.125760I$	$1.88776 - 1.50114I$	$7.21238 + 4.30156I$
$u = 0.060670 - 0.183744I$ $a = 0.36004 - 5.05217I$ $b = -0.395346 + 1.125760I$	$1.88776 + 1.50114I$	$7.21238 - 4.30156I$

II. $\boldsymbol{I_2^u = \langle -44u^{17} + 4u^{16} + \cdots + 69b + 127u,\ -44u^{17} - 264u^{15} + \cdots + 69a - 224,\ u^{18} + 6u^{16} + \cdots + 3u + 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2+1 \\ u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.637681u^{17} + 3.82609u^{15} + \cdots + 2.66667u + 3.24638 \\ 0.637681u^{17} - 0.0579710u^{16} + \cdots + 3.91304u^2 - 1.84058u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.637681u^{17} + 3.82609u^{15} + \cdots + 2.66667u + 3.24638 \\ 0.637681u^{17} + 0.173913u^{16} + \cdots + 5.24638u^2 - 2.47826u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0.594203u^{17} + 3.56522u^{15} + \cdots + 3.66667u + 0.115942 \\ 0.594203u^{17} - 0.594203u^{16} + \cdots - 3.55072u^2 - 0.115942u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^2+1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.840580u^{17} + 5.04348u^{15} + \cdots + 4.33333u + 3.18841 \\ 0.840580u^{17} - 0.0579710u^{16} + \cdots + 3.85507u^2 - 1.84058u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ -u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 - u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{20}{23}u^{15} + \frac{100}{23}u^{13} + \frac{44}{23}u^{12} + \frac{200}{23}u^{11} + \frac{176}{23}u^{10} + \frac{316}{23}u^9 + \frac{264}{23}u^8 + \frac{448}{23}u^7 + \frac{260}{23}u^6 + 16u^5 + \frac{212}{23}u^4 + \frac{208}{23}u^3 + \frac{84}{23}u^2 + 4u + \frac{106}{23}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{18} + 12u^{17} + \cdots + 3u + 1$
c_2, c_3, c_5 c_7	$u^{18} + 6u^{16} + \cdots - 3u + 1$
c_4	$(u^6 + 3u^5 + 5u^4 + 4u^3 + 2u^2 + u + 1)^3$
c_6	$u^{18} - 12u^{17} + \cdots - 3u + 1$
c_8, c_{11}	$(u^6 + u^5 - u^4 - 2u^3 + u + 1)^3$
c_9	$(u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)^3$
c_{10}, c_{12}	$(u^6 - u^5 - u^4 + 2u^3 - u + 1)^3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_6	$y^{18} - 12y^{17} + \cdots + 95y + 1$
c_2, c_3, c_5 c_7	$y^{18} + 12y^{17} + \cdots + 3y + 1$
c_4, c_9	$(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)^3$
c_8, c_{10}, c_{11} c_{12}	$(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.577722 + 0.852843I$ $a = -0.598036 + 0.102351I$ $b = -0.488236 - 0.375359I$	$-1.89061 - 0.92430I$	$-3.71672 + 0.79423I$
$u = -0.577722 - 0.852843I$ $a = -0.598036 - 0.102351I$ $b = -0.488236 + 0.375359I$	$-1.89061 + 0.92430I$	$-3.71672 - 0.79423I$
$u = 0.196160 + 0.885066I$ $a = 0.419078 + 1.129010I$ $b = -2.92263 - 1.35280I$	$1.89061 - 0.92430I$	$3.71672 + 0.79423I$
$u = 0.196160 - 0.885066I$ $a = 0.419078 - 1.129010I$ $b = -2.92263 + 1.35280I$	$1.89061 + 0.92430I$	$3.71672 - 0.79423I$
$u = -0.945163 + 0.610473I$ $a = 1.206700 - 0.490377I$ $b = 0.819070 - 0.094621I$	$-5.69302I$	$0. + 5.51057I$
$u = -0.945163 - 0.610473I$ $a = 1.206700 + 0.490377I$ $b = 0.819070 + 0.094621I$	$5.69302I$	$0. - 5.51057I$
$u = 0.090472 + 1.133120I$ $a = -0.583686 + 0.762709I$ $b = -3.11733 - 0.76503I$	$1.89061 + 0.92430I$	$3.71672 - 0.79423I$
$u = 0.090472 - 1.133120I$ $a = -0.583686 - 0.762709I$ $b = -3.11733 + 0.76503I$	$1.89061 - 0.92430I$	$3.71672 + 0.79423I$
$u = 0.686633 + 0.502578I$ $a = -0.150201 - 0.718978I$ $b = -0.530542 - 0.156218I$	$-1.89061 - 0.92430I$	$-3.71672 + 0.79423I$
$u = 0.686633 - 0.502578I$ $a = -0.150201 + 0.718978I$ $b = -0.530542 + 0.156218I$	$-1.89061 + 0.92430I$	$-3.71672 - 0.79423I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.824262 + 0.925280I$ $a = 0.271648 + 1.151080I$ $b = 0.190767 + 0.581448I$	$-5.69302I$	$0. + 5.51057I$
$u = 0.824262 - 0.925280I$ $a = 0.271648 - 1.151080I$ $b = 0.190767 - 0.581448I$	$5.69302I$	$0. - 5.51057I$
$u = -0.108911 + 1.355420I$ $a = 0.402013 - 0.222804I$ $b = 1.71123 - 1.31922I$	$-1.89061 + 0.92430I$	$-3.71672 - 0.79423I$
$u = -0.108911 - 1.355420I$ $a = 0.402013 + 0.222804I$ $b = 1.71123 + 1.31922I$	$-1.89061 - 0.92430I$	$-3.71672 + 0.79423I$
$u = 0.12090 + 1.53575I$ $a = -0.819509 + 0.483205I$ $b = -2.32751 + 0.84183I$	$5.69302I$	$0. - 5.51057I$
$u = 0.12090 - 1.53575I$ $a = -0.819509 - 0.483205I$ $b = -2.32751 - 0.84183I$	$-5.69302I$	$0. + 5.51057I$
$u = -0.286632 + 0.248050I$ $a = 2.85200 + 0.40141I$ $b = 0.665192 - 0.947661I$	$1.89061 - 0.92430I$	$3.71672 + 0.79423I$
$u = -0.286632 - 0.248050I$ $a = 2.85200 - 0.40141I$ $b = 0.665192 + 0.947661I$	$1.89061 + 0.92430I$	$3.71672 - 0.79423I$

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

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} a \\ -a^4 + a^3u - 2a^2 + au + u - 2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} a \\ -a^4 + a^3u - 2a^2 + au - a + u - 2 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -a^2 \\ -a^4u + a^4 - a^2u + a^2 - au + a \end{pmatrix}$$

$$a_4 = \begin{pmatrix} a^4u \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} a^4 \\ -a^4 - 2a^2 + u - 2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} a^4 \\ u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} a^4 + u \\ u \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4a^3 + 4a^2 - 4a + 4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.000000I$ $a = -0.339110 + 0.822375I$ $b = -1.43128 + 1.79928I$	$0.32910 + 1.53058I$	$0.51511 - 4.43065I$
$u = 1.000000I$ $a = -0.339110 - 0.822375I$ $b = -0.331455 + 0.820551I$	$0.32910 - 1.53058I$	$0.51511 + 4.43065I$
$u = 1.000000I$ $a = 0.766826$ $b = -3.52181 + 2.21774I$	2.40108	1.48110
$u = 1.000000I$ $a = 0.455697 + 1.200150I$ $b = -0.0768928 + 0.0902877I$	$5.87256 - 4.40083I$	$4.74431 + 3.49859I$
$u = 1.000000I$ $a = 0.455697 - 1.200150I$ $b = 0.361438 - 0.927855I$	$5.87256 + 4.40083I$	$4.74431 - 3.49859I$
$u = -1.000000I$ $a = -0.339110 + 0.822375I$ $b = -0.331455 - 0.820551I$	$0.32910 + 1.53058I$	$0.51511 - 4.43065I$
$u = -1.000000I$ $a = -0.339110 - 0.822375I$ $b = -1.43128 - 1.79928I$	$0.32910 - 1.53058I$	$0.51511 + 4.43065I$
$u = -1.000000I$ $a = 0.766826$ $b = -3.52181 - 2.21774I$	2.40108	1.48110
$u = -1.000000I$ $a = 0.455697 + 1.200150I$ $b = 0.361438 + 0.927855I$	$5.87256 - 4.40083I$	$4.74431 + 3.49859I$
$u = -1.000000I$ $a = 0.455697 - 1.200150I$ $b = -0.0768928 - 0.0902877I$	$5.87256 + 4.40083I$	$4.74431 - 3.49859I$

IV. $\boldsymbol{I_4^u = \langle -3u^3 + 6u^2 + 4b - 5u + 1,\ u^3 + 2a - u + 3,\ u^4 - u^3 + u^2 + 1 \rangle}$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} -\frac{1}{2}u^3 + \frac{1}{2}u - \frac{3}{2} \\ \frac{3}{4}u^3 - \frac{3}{2}u^2 + \frac{5}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{1}{2}u^3 + \frac{1}{2}u - \frac{3}{2} \\ \frac{5}{4}u^3 - \frac{5}{2}u^2 + \frac{7}{4}u + \frac{1}{4} \end{pmatrix}$$

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

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

$$a_{11} = \begin{pmatrix} -\frac{1}{2}u^3 + u^2 + \frac{1}{2}u - \frac{1}{2} \\ \frac{5}{4}u^3 - \frac{3}{2}u^2 + \frac{7}{4}u + \frac{1}{4} \end{pmatrix}$$

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

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

$$a_6 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{71}{16}u^3 + \frac{7}{8}u^2 + \frac{241}{16}u + \frac{147}{16}$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_7	$y^4 + 5y^3 + 7y^2 + 2y + 1$
c_2, c_5	$y^4 + y^3 + 3y^2 + 2y + 1$
c_4	$y^4 + 9y^3 + 31y^2 + 19y + 4$
c_6	$y^4 - 11y^3 + 31y^2 + 10y + 1$
c_8, c_{11}	$(y-1)^4$
c_9, c_{10}	$4(4y^4 + 19y^3 + 31y^2 + 9y + 1)$
c_{12}	y^4

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351808 + 0.720342I$ $a = -1.92796 + 0.41333I$ $b = 0.28101 + 1.58096I$	$1.43393 - 1.41510I$	$5.77964 + 9.93490I$
$u = -0.351808 - 0.720342I$ $a = -1.92796 - 0.41333I$ $b = 0.28101 - 1.58096I$	$1.43393 + 1.41510I$	$5.77964 - 9.93490I$
$u = 0.851808 + 0.911292I$ $a = -0.322042 - 0.157780I$ $b = -0.156006 - 0.269484I$	$8.43568 + 3.16396I$	$15.2516 + 20.5289I$
$u = 0.851808 - 0.911292I$ $a = -0.322042 + 0.157780I$ $b = -0.156006 + 0.269484I$	$8.43568 - 3.16396I$	$15.2516 - 20.5289I$

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^{10})(u^4-u^3+3u^2-2u+1)(u^{18}+12u^{17}+\cdots+3u+1)$ $\cdot(u^{54}+60u^{53}+\cdots+17614u+289)$
c_2	$((u^2+1)^5)(u^4-u^3+u^2+1)(u^{18}+6u^{16}+\cdots-3u+1)$ $\cdot(u^{54}+2u^{53}+\cdots+112u+17)$
c_3	$((u^2+1)^5)(u^4-u^3+3u^2-2u+1)(u^{18}+6u^{16}+\cdots-3u+1)$ $\cdot(u^{54}+2u^{53}+\cdots+20u+17)$
c_4	$(u^4-u^3+5u^2+u+2)(u^6+3u^5+5u^4+4u^3+2u^2+u+1)^3$ $\cdot(u^{10}+u^8+8u^6+3u^4+3u^2+1)(u^{54}-7u^{53}+\cdots-8u+4)$
c_5	$((u^2+1)^5)(u^4+u^3+u^2+1)(u^{18}+6u^{16}+\cdots-3u+1)$ $\cdot(u^{54}+2u^{53}+\cdots+112u+17)$
c_6	$((u+1)^{10})(u^4+5u^3+\cdots+2u+1)(u^{18}-12u^{17}+\cdots-3u+1)$ $\cdot(u^{54}-20u^{53}+\cdots-15886u+289)$
c_7	$((u^2+1)^5)(u^4+u^3+3u^2+2u+1)(u^{18}+6u^{16}+\cdots-3u+1)$ $\cdot(u^{54}+2u^{53}+\cdots+20u+17)$
c_8	$(u+1)^4(u^5-u^4-2u^3+u^2+u+1)^2(u^6+u^5-u^4-2u^3+u+1)^3$ $\cdot(u^{54}+4u^{53}+\cdots+481u+16)$
c_9	$4(2u^4-u^3+5u^2+u+1)(u^6-3u^5+5u^4-4u^3+2u^2-u+1)^3$ $\cdot(u^{10}-3u^8+4u^6-u^4-u^2+1)(2u^{54}+11u^{53}+\cdots+27633u+3982)$
c_{10}	$4(2u^4-u^3+5u^2+u+1)(u^6-u^5-u^4+2u^3-u+1)^3$ $\cdot(u^{10}+5u^8+8u^6+3u^4-u^2+1)(2u^{54}+3u^{53}+\cdots-26787u+17894)$
c_{11}	$(u-1)^4(u^5+u^4-2u^3-u^2+u-1)^2(u^6+u^5-u^4-2u^3+u+1)^3$ $\cdot(u^{54}+4u^{53}+\cdots+481u+16)$
c_{12}	$u^4(u^5-u^4+2u^3-u^2+u-1)^2(u^6-u^5-u^4+2u^3-u+1)^3$ $\cdot(u^{54}-8u^{53}+\cdots-2976u+256)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^{10})(y^4+5y^3+\cdots+2y+1)(y^{18}-12y^{17}+\cdots+95y+1)$ $\cdot(y^{54}-120y^{53}+\cdots-34842354y+83521)$
c_2, c_5	$((y+1)^{10})(y^4+y^3+3y^2+2y+1)(y^{18}+12y^{17}+\cdots+3y+1)$ $\cdot(y^{54}+60y^{53}+\cdots+17614y+289)$
c_3, c_7	$((y+1)^{10})(y^4+5y^3+\cdots+2y+1)(y^{18}+12y^{17}+\cdots+3y+1)$ $\cdot(y^{54}+20y^{53}+\cdots+15886y+289)$
c_4	$(y^4+9y^3+31y^2+19y+4)(y^5+y^4+8y^3+3y^2+3y+1)^2$ $\cdot((y^6+y^5+5y^4+6y^2+3y+1)^3)(y^{54}+17y^{53}+\cdots+152y+16)$
c_6	$((y-1)^{10})(y^4-11y^3+\cdots+10y+1)(y^{18}-12y^{17}+\cdots+95y+1)$ $\cdot(y^{54}+40y^{53}+\cdots-35600546y+83521)$
c_8, c_{11}	$(y-1)^4(y^5-5y^4+8y^3-3y^2-y-1)^2$ $\cdot(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^3$ $\cdot(y^{54}-32y^{53}+\cdots-95457y+256)$
c_9	$16(4y^4+19y^3+31y^2+9y+1)(y^5-3y^4+4y^3-y^2-y+1)^2$ $\cdot(y^6+y^5+5y^4+6y^2+3y+1)^3$ $\cdot(4y^{54}-173y^{53}+\cdots+170212239y+15856324)$
c_{10}	$16(4y^4+19y^3+31y^2+9y+1)(y^5+5y^4+8y^3+3y^2-y+1)^2$ $\cdot(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^3$ $\cdot(4y^{54}-205y^{53}+\cdots+5530254095y+320195236)$
c_{12}	$y^4(y^5+3y^4+\cdots-y-1)^2(y^6-3y^5+\cdots-y+1)^3$ $\cdot(y^{54}-12y^{53}+\cdots-1545216y+65536)$