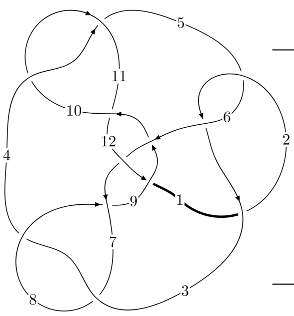
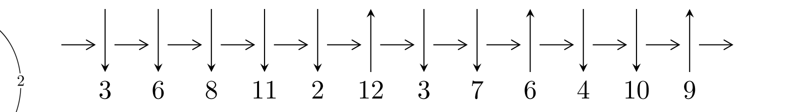
$12n_{0416}$ $(K12n_{0416})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 261u^{16} - 101u^{15} + \cdots + 817b + 94,\ 113u^{16} + 166u^{15} + \cdots + 817a - 745,$$
$$u^{17} - 6u^{15} + 15u^{13} - u^{12} - 15u^{11} + 5u^{10} - 5u^9 - 10u^8 + 24u^7 + 11u^6 - 18u^5 - 7u^4 + 4u^3 + 3u^2 + u - 1\rangle$$
$$I_2^u = \langle -1.51873 \times 10^{37}u^{39} - 1.89646 \times 10^{37}u^{38} + \cdots + 1.21750 \times 10^{38}b - 1.24577 \times 10^{38},$$
$$2.13718 \times 10^{37}u^{39} + 1.36142 \times 10^{37}u^{38} + \cdots + 3.65251 \times 10^{38}a + 1.26689 \times 10^{39},\ u^{40} + u^{39} + \cdots - 24u - 9$$
$$I_3^u = \langle -u^8 + 2u^6 - 2u^4 - u^3 + u^2 + b + 1,\ u^8 - u^7 - 3u^6 + 2u^5 + 4u^4 - 2u^3 - 4u^2 + a + u + 1,$$
$$u^9 - 3u^7 + 5u^5 + u^4 - 5u^3 - u^2 + 2u + 1\rangle$$
$$I_4^u = \langle u^6 - 2u^4 - u^3 + u^2 + b - 1,\ -2u^9 + 2u^8 + 5u^7 - 4u^6 - 8u^5 + 7u^4 + 8u^3 - 5u^2 + a - 6u + 5,$$
$$u^{10} - 3u^8 - u^7 + 4u^6 + u^5 - 4u^4 - u^3 + 3u^2 - 1\rangle$$

* 4 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 76 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. $\boldsymbol{I_1^u = \langle 261u^{16} - 101u^{15} + \cdots + 817b + 94,\ 113u^{16} + 166u^{15} + \cdots + 817a - 745,\ u^{17} - 6u^{15} + \cdots + u - 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.138311u^{16} - 0.203182u^{15} + \cdots - 0.357405u + 0.911873 \\ -0.319461u^{16} + 0.123623u^{15} + \cdots + 0.422277u - 0.115055 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.00979192u^{16} + 0.206854u^{15} + \cdots + 2.23133u + 0.728274 \\ -0.567931u^{16} - 0.00244798u^{15} + \cdots - 1.58262u + 0.239902 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.297430u^{16} + 0.0917993u^{15} + \cdots - 0.151775u + 1.00367 \\ 0.138311u^{16} + 0.203182u^{15} + \cdots + 0.357405u + 0.0881273 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.134639u^{16} + 0.0942472u^{15} + \cdots + 0.430845u + 0.763770 \\ -0.564259u^{16} + 0.294982u^{15} + \cdots + 0.205630u + 0.0917993 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.134639u^{16} + 0.0942472u^{15} + \cdots + 0.430845u + 0.763770 \\ -0.198286u^{16} - 0.0611995u^{15} + \cdots + 0.434517u - 0.00244798 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.0917993u^{16} + 0.435741u^{15} + \cdots + 1.70624u + 0.297430 \\ 0.203182u^{16} + 0.457772u^{15} + \cdots - 1.05018u + 0.138311 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.297430u^{16} + 0.0917993u^{15} + \cdots - 0.151775u + 1.00367 \\ 0.138311u^{16} + 0.203182u^{15} + \cdots + 0.357405u + 0.0881273 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{33}{817}u^{16} - \frac{1856}{817}u^{15} + \cdots - \frac{7084}{817}u - \frac{8473}{817}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{17} + 14u^{16} + \cdots + 3584u + 1024$
c_2, c_5	$u^{17} + 10u^{16} + \cdots + 160u + 32$
c_3, c_4, c_7 c_{10}	$u^{17} - 6u^{15} + \cdots + u + 1$
c_6	$u^{17} - 6u^{16} + \cdots - 12u + 8$
c_8, c_{11}	$u^{17} + 12u^{16} + \cdots + 7u + 1$
c_9, c_{12}	$u^{17} + 2u^{16} + \cdots + 12u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{17} - 22y^{16} + \cdots - 4587520y - 1048576$
c_2, c_5	$y^{17} - 14y^{16} + \cdots + 3584y - 1024$
c_3, c_4, c_7 c_{10}	$y^{17} - 12y^{16} + \cdots + 7y - 1$
c_6	$y^{17} - 6y^{16} + \cdots + 720y - 64$
c_8, c_{11}	$y^{17} - 12y^{16} + \cdots + 19y - 1$
c_9, c_{12}	$y^{17} + 24y^{16} + \cdots + 34y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.872688 + 0.309245I$ $a = -1.10902 + 0.97065I$ $b = 1.22842 + 0.81409I$	$-1.17696 + 5.14107I$	$-6.11359 - 6.50734I$
$u = -0.872688 - 0.309245I$ $a = -1.10902 - 0.97065I$ $b = 1.22842 - 0.81409I$	$-1.17696 - 5.14107I$	$-6.11359 + 6.50734I$
$u = 0.112694 + 1.077070I$ $a = 1.37425 + 0.41818I$ $b = -0.905176 - 0.807152I$	$-5.24123 + 3.03176I$	$-5.90001 - 2.22137I$
$u = 0.112694 - 1.077070I$ $a = 1.37425 - 0.41818I$ $b = -0.905176 + 0.807152I$	$-5.24123 - 3.03176I$	$-5.90001 + 2.22137I$
$u = 0.770678 + 0.254682I$ $a = -0.350181 - 0.951046I$ $b = 1.009160 - 0.082155I$	$-0.500652 - 0.396435I$	$-8.19182 + 2.68087I$
$u = 0.770678 - 0.254682I$ $a = -0.350181 + 0.951046I$ $b = 1.009160 + 0.082155I$	$-0.500652 + 0.396435I$	$-8.19182 - 2.68087I$
$u = -1.220540 + 0.157617I$ $a = -0.501451 + 0.512731I$ $b = -0.500714 + 0.816049I$	$-6.48988 + 1.76820I$	$-13.17903 - 1.70263I$
$u = -1.220540 - 0.157617I$ $a = -0.501451 - 0.512731I$ $b = -0.500714 - 0.816049I$	$-6.48988 - 1.76820I$	$-13.17903 + 1.70263I$
$u = 1.251960 + 0.260556I$ $a = 0.82098 + 1.51753I$ $b = -1.079480 + 0.641251I$	$-4.75266 - 7.21790I$	$-11.92961 + 6.92939I$
$u = 1.251960 - 0.260556I$ $a = 0.82098 - 1.51753I$ $b = -1.079480 - 0.641251I$	$-4.75266 + 7.21790I$	$-11.92961 - 6.92939I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.329090 + 0.472313I$ $a = -0.038538 + 0.181070I$ $b = -0.79169 - 1.20549I$	$-14.4213 - 7.4571I$	$-11.51687 + 4.18112I$
$u = 1.329090 - 0.472313I$ $a = -0.038538 - 0.181070I$ $b = -0.79169 + 1.20549I$	$-14.4213 + 7.4571I$	$-11.51687 - 4.18112I$
$u = -0.246489 + 0.489685I$ $a = 1.73580 - 0.42019I$ $b = -0.968967 + 0.317789I$	$1.66217 - 1.14629I$	$1.43775 + 2.20534I$
$u = -0.246489 - 0.489685I$ $a = 1.73580 + 0.42019I$ $b = -0.968967 - 0.317789I$	$1.66217 + 1.14629I$	$1.43775 - 2.20534I$
$u = -1.35873 + 0.57627I$ $a = 1.29756 - 0.84527I$ $b = -1.17071 - 0.90048I$	$-13.0830 + 14.9833I$	$-9.98102 - 7.51290I$
$u = -1.35873 - 0.57627I$ $a = 1.29756 + 0.84527I$ $b = -1.17071 + 0.90048I$	$-13.0830 - 14.9833I$	$-9.98102 + 7.51290I$
$u = 0.468027$ $a = 0.541197$ $b = 0.358302$	-0.819496	-12.2520

II.
$\boldsymbol{I_2^u = \langle -1.52\times10^{37}u^{39} - 1.90\times10^{37}u^{38} + \cdots + 1.22\times10^{38}b - 1.25\times10^{38},\ 2.14\times10^{37}u^{39} + 1.36\times10^{37}u^{38} + \cdots + 3.65\times10^{38}a + 1.27\times10^{39},\ u^{40} + u^{39} + \cdots - 24u - 9\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.0585128u^{39} - 0.0372737u^{38} + \cdots + 1.70400u - 3.46855 \\ 0.124742u^{39} + 0.155767u^{38} + \cdots + 2.43424u + 1.02322 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.201855u^{39} + 0.202202u^{38} + \cdots + 6.51731u + 1.59348 \\ 0.147685u^{39} + 0.0264282u^{38} + \cdots + 2.61080u + 0.354275 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.0813577u^{39} - 0.202188u^{38} + \cdots + 7.28317u + 1.97309 \\ 0.0286342u^{39} + 0.0928329u^{38} + \cdots - 3.22599u + 0.539866 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.200240u^{39} - 0.0544321u^{38} + \cdots + 5.36707u - 1.24072 \\ 0.118463u^{39} + 0.127401u^{38} + \cdots + 1.05224u + 0.660498 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.200240u^{39} - 0.0544321u^{38} + \cdots + 5.36707u - 1.24072 \\ 0.420625u^{39} + 0.140972u^{38} + \cdots - 0.644987u - 0.651772 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.835765u^{39} + 0.0374218u^{38} + \cdots - 22.3043u - 11.6309 \\ 0.114623u^{39} + 0.0818378u^{38} + \cdots + 5.71886u - 0.0603670 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.175078u^{39} - 0.284313u^{38} + \cdots + 4.95360u + 0.359674 \\ -0.0140809u^{39} + 0.0620252u^{38} + \cdots - 4.27325u + 0.570666 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 0.893186u^{39} + 0.382084u^{38} + \cdots - 32.1739u - 19.4647$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{20} + 30u^{19} + \cdots + 881u + 25)^2$
c_2, c_5	$(u^{20} - 4u^{19} + \cdots - 9u - 5)^2$
c_3, c_4, c_7 c_{10}	$u^{40} - u^{39} + \cdots + 24u - 9$
c_6	$(u^{20} + 2u^{19} + \cdots + 2u - 1)^2$
c_8, c_{11}	$u^{40} + 27u^{39} + \cdots - 702u + 81$
c_9, c_{12}	$u^{40} + 8u^{39} + \cdots - 241750u - 136681$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{20} - 82y^{19} + \cdots - 403661y + 625)^2$
c_2, c_5	$(y^{20} - 30y^{19} + \cdots - 881y + 25)^2$
c_3, c_4, c_7 c_{10}	$y^{40} - 27y^{39} + \cdots + 702y + 81$
c_6	$(y^{20} - 6y^{19} + \cdots - 26y + 1)^2$
c_8, c_{11}	$y^{40} - 19y^{39} + \cdots - 578178y + 6561$
c_9, c_{12}	$y^{40} - 2y^{39} + \cdots + 22299598078y + 18681695761$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.985793 + 0.106099I$ $a = 1.47285 + 0.70515I$ $b = -1.313450 + 0.406280I$	$-0.81957 - 1.24696I$	$-7.62468 + 0.13280I$
$u = 0.985793 - 0.106099I$ $a = 1.47285 - 0.70515I$ $b = -1.313450 - 0.406280I$	$-0.81957 + 1.24696I$	$-7.62468 - 0.13280I$
$u = -0.061557 + 0.981252I$ $a = -1.42687 + 0.39525I$ $b = 0.740083 - 0.981052I$	$-10.10780 + 2.32175I$	$-8.97701 - 0.73874I$
$u = -0.061557 - 0.981252I$ $a = -1.42687 - 0.39525I$ $b = 0.740083 + 0.981052I$	$-10.10780 - 2.32175I$	$-8.97701 + 0.73874I$
$u = 0.836619 + 0.625265I$ $a = -1.68057 + 0.31357I$ $b = 0.745821 - 0.208249I$	$1.03980 - 5.20042I$	$-4.45133 + 5.57600I$
$u = 0.836619 - 0.625265I$ $a = -1.68057 - 0.31357I$ $b = 0.745821 + 0.208249I$	$1.03980 + 5.20042I$	$-4.45133 - 5.57600I$
$u = 1.092520 + 0.041392I$ $a = 0.114066 - 0.561701I$ $b = 0.687385 - 0.749134I$	$-1.84004 - 0.63402I$	$-8.04331 - 0.15211I$
$u = 1.092520 - 0.041392I$ $a = 0.114066 + 0.561701I$ $b = 0.687385 + 0.749134I$	$-1.84004 + 0.63402I$	$-8.04331 + 0.15211I$
$u = -0.671937 + 0.604612I$ $a = 0.525601 - 0.779399I$ $b = -1.313450 + 0.406280I$	$-0.81957 - 1.24696I$	$-7.62468 + 0.13280I$
$u = -0.671937 - 0.604612I$ $a = 0.525601 + 0.779399I$ $b = -1.313450 - 0.406280I$	$-0.81957 + 1.24696I$	$-7.62468 - 0.13280I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.10100$ $a=-3.54571$ $b=\ 0.847094$	-8.45151	-8.71120
$u=\ 0.850304+0.713148I$ $a=\ 1.013260+0.848398I$ $b=-0.493869$	1.03533	$-6.45138+0.I$
$u=\ 0.850304-0.713148I$ $a=\ 1.013260-0.848398I$ $b=-0.493869$	1.03533	$-6.45138+0.I$
$u=-0.562871+0.677759I$ $a=\ 1.350220+0.203953I$ $b=-0.846857$	2.60911	$-60.518982+0.10I$
$u=-0.562871-0.677759I$ $a=\ 1.350220-0.203953I$ $b=-0.846857$	2.60911	$-60.518982+0.10I$
$u=-0.069227+1.125560I$ $a=-1.36033+0.39893I$ $b=\ 1.077500-0.827760I$	$-9.04644-8.94980I$	$-7.77982+5.10458I$
$u=-0.069227-1.125560I$ $a=-1.36033-0.39893I$ $b=\ 1.077500+0.827760I$	$-9.04644+8.94980I$	$-7.77982-5.10458I$
$u=-1.093460+0.370616I$ $a=-0.98200+1.09858I$ $b=\ 1.011700+0.632363I$	$-0.78834+4.67433I$	$-5.30649-6.82521I$
$u=-1.093460-0.370616I$ $a=-0.98200-1.09858I$ $b=\ 1.011700-0.632363I$	$-0.78834-4.67433I$	$-5.30649+6.82521I$
$u=-1.157600+0.120447I$ $a=-0.042441-0.362661I$ $b=-0.656124-1.053570I$	$-3.80624+5.08920I$	$-12.34652-4.90346I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.157600-0.120447I$ $a=-0.042441+0.362661I$ $b=-0.656124+1.053570I$	$-3.80624-5.08920I$	$-12.34652+4.90346I$
$u=\ \ 1.043330+0.515865I$ $a=\ \ 0.976781+0.822046I$ $b=-0.656124+1.053570I$	$-3.80624-5.08920I$	$-12.34652+4.90346I$
$u=\ \ 1.043330-0.515865I$ $a=\ \ 0.976781-0.822046I$ $b=-0.656124-1.053570I$	$-3.80624+5.08920I$	$-12.34652-4.90346I$
$u=-0.746386$ $a=-4.63725$ $b=-0.254182$	-7.16640	-21.4380
$u=-1.096590+0.652317I$ $a=-0.831505+0.847751I$ $b=\ \ 0.745821+0.208249I$	$1.03980+5.20042I$	$-4.45133-5.57600I$
$u=-1.096590-0.652317I$ $a=-0.831505-0.847751I$ $b=\ \ 0.745821-0.208249I$	$1.03980-5.20042I$	$-4.45133+5.57600I$
$u=\ \ 0.331219+0.637366I$ $a=-0.382754-0.453408I$ $b=\ \ 0.687385+0.749134I$	$-1.84004+0.63402I$	$-8.04331+0.15211I$
$u=\ \ 0.331219-0.637366I$ $a=-0.382754+0.453408I$ $b=\ \ 0.687385-0.749134I$	$-1.84004-0.63402I$	$-8.04331-0.15211I$
$u=-1.300800+0.543331I$ $a=\ \ 1.58939-0.86240I$ $b=-0.919010-0.840072I$	$-13.8803+3.1384I$	$-10.93015+0.I$
$u=-1.300800-0.543331I$ $a=\ \ 1.58939+0.86240I$ $b=-0.919010+0.840072I$	$-13.8803-3.1384I$	$-10.93015+0.I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.33349 + 0.57768I$ $a = -1.40702 - 0.79123I$ $b = 1.077500 - 0.827760I$	$-9.04644 - 8.94980I$	0
$u = 1.33349 - 0.57768I$ $a = -1.40702 + 0.79123I$ $b = 1.077500 + 0.827760I$	$-9.04644 + 8.94980I$	0
$u = -1.39353 + 0.44049I$ $a = -0.061607 + 0.191617I$ $b = 0.740083 - 0.981052I$	$-10.10780 + 2.32175I$	0
$u = -1.39353 - 0.44049I$ $a = -0.061607 - 0.191617I$ $b = 0.740083 + 0.981052I$	$-10.10780 - 2.32175I$	0
$u = -1.47294$ $a = -0.409227$ $b = -0.254182$	-7.16640	-21.4380
$u = 1.47987$ $a = 0.579170$ $b = 0.847094$	-8.45151	-8.71120
$u = 1.44287 + 0.49042I$ $a = 0.097964 + 0.290556I$ $b = -0.919010 - 0.840072I$	$-13.8803 + 3.1384I$	0
$u = 1.44287 - 0.49042I$ $a = 0.097964 - 0.290556I$ $b = -0.919010 + 0.840072I$	$-13.8803 - 3.1384I$	0
$u = -0.088339 + 0.296040I$ $a = -3.29187 + 1.03172I$ $b = 1.011700 + 0.632363I$	$-0.78834 + 4.67433I$	$-5.30649 - 6.82521I$
$u = -0.088339 - 0.296040I$ $a = -3.29187 - 1.03172I$ $b = 1.011700 - 0.632363I$	$-0.78834 - 4.67433I$	$-5.30649 + 6.82521I$

III. $I_3^u = \langle -u^8 + 2u^6 - 2u^4 - u^3 + u^2 + b + 1,\ u^8 - u^7 + \cdots + a + 1,\ u^9 - 3u^7 + 5u^5 + u^4 - 5u^3 - u^2 + 2u + 1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -u^8 + u^7 + 3u^6 - 2u^5 - 4u^4 + 2u^3 + 4u^2 - u - 1 \\ u^8 - 2u^6 + 2u^4 + u^3 - u^2 - 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^8 - 3u^6 + 5u^4 - 5u^2 + 2 \\ -u^8 + 2u^6 - u^5 - 3u^4 + u^3 + 2u^2 - 2u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^6 - u^5 - 2u^4 + u^3 + 2u^2 - u - 1 \\ u^8 - u^7 - 3u^6 + 2u^5 + 4u^4 - 2u^3 - 3u^2 + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u^8 + u^7 + 3u^6 - 2u^5 - 5u^4 + 2u^3 + 5u^2 - u - 2 \\ u^8 - 2u^6 + 2u^4 + u^3 - u^2 + u - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^8 + u^7 + 3u^6 - 2u^5 - 5u^4 + 2u^3 + 5u^2 - u - 2 \\ u^8 - u^7 - 2u^6 + 2u^5 + 3u^4 - 2u^3 - 2u^2 + 2u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^7 - u^6 - 2u^5 + u^4 + 3u^3 - u^2 - 2u \\ -u^8 + 2u^6 - 3u^4 + 2u^2 - u - 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^6 - u^5 - 2u^4 + u^3 + 3u^2 - u - 1 \\ u^8 - u^7 - 3u^6 + 2u^5 + 5u^4 - 2u^3 - 4u^2 + u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= u^8 + 6u^7 - 3u^6 - 10u^5 + 4u^4 + 15u^3 + 3u^2 - 11u - 7$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^9 - 9u^8 + 28u^7 - 51u^6 + 59u^5 - 48u^4 + 29u^3 - 14u^2 + 5u - 1$
c_2	$u^9 - u^8 - 4u^7 + u^6 + 5u^5 - 2u^4 - 3u^3 + 2u^2 + u - 1$
c_3, c_{10}	$u^9 - 3u^7 + 5u^5 - u^4 - 5u^3 + u^2 + 2u - 1$
c_4, c_7	$u^9 - 3u^7 + 5u^5 + u^4 - 5u^3 - u^2 + 2u + 1$
c_5	$u^9 + u^8 - 4u^7 - u^6 + 5u^5 + 2u^4 - 3u^3 - 2u^2 + u + 1$
c_6	$u^9 + u^8 - 2u^7 - 3u^6 + 2u^5 + 5u^4 - u^3 - 4u^2 + u + 1$
c_8, c_{11}	$u^9 + 6u^8 + 19u^7 + 40u^6 + 59u^5 + 63u^4 + 47u^3 + 23u^2 + 6u + 1$
c_9, c_{12}	$u^9 + 4u^8 + 3u^7 - u^6 - 6u^5 - 3u^4 - u^3 + 2u^2 + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^9 - 25y^8 - 16y^7 - 103y^6 - 33y^5 - 48y^4 - 15y^3 - 2y^2 - 3y - 1$
c_2, c_5	$y^9 - 9y^8 + 28y^7 - 51y^6 + 59y^5 - 48y^4 + 29y^3 - 14y^2 + 5y - 1$
c_3, c_4, c_7 c_{10}	$y^9 - 6y^8 + 19y^7 - 40y^6 + 59y^5 - 63y^4 + 47y^3 - 23y^2 + 6y - 1$
c_6	$y^9 - 5y^8 + 14y^7 - 29y^6 + 48y^5 - 59y^4 + 51y^3 - 28y^2 + 9y - 1$
c_8, c_{11}	$y^9 + 2y^8 - y^7 - 20y^6 - 37y^5 - 47y^4 - 61y^3 - 91y^2 - 10y - 1$
c_9, c_{12}	$y^9 - 10y^8 + 5y^7 - 15y^6 + 10y^5 + 5y^4 + 3y^3 - 3y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.022180 + 0.325067I$ $a = 0.587091 + 1.128900I$ $b = -0.846738 + 0.986047I$	$-2.29340 - 6.07855I$	$-8.47383 + 8.86704I$
$u = 1.022180 - 0.325067I$ $a = 0.587091 - 1.128900I$ $b = -0.846738 - 0.986047I$	$-2.29340 + 6.07855I$	$-8.47383 - 8.86704I$
$u = -0.915990 + 0.694675I$ $a = -1.58210 + 0.48658I$ $b = 0.993839 + 0.427672I$	$1.17777 + 6.95533I$	$-4.27023 - 9.54243I$
$u = -0.915990 - 0.694675I$ $a = -1.58210 - 0.48658I$ $b = 0.993839 - 0.427672I$	$1.17777 - 6.95533I$	$-4.27023 + 9.54243I$
$u = 1.047510 + 0.647735I$ $a = -0.881374 - 0.604152I$ $b = 0.781614 + 0.355685I$	$0.33154 - 3.66672I$	$-8.46619 + 1.40357I$
$u = 1.047510 - 0.647735I$ $a = -0.881374 + 0.604152I$ $b = 0.781614 - 0.355685I$	$0.33154 + 3.66672I$	$-8.46619 - 1.40357I$
$u = -1.31380$ $a = -1.61123$ $b = -0.443802$	-9.54268	-17.4150
$u = -0.496798 + 0.288456I$ $a = 0.182003 - 0.761275I$ $b = -1.206810 + 0.297957I$	$0.620620 - 0.259550I$	$-1.58232 - 1.92541I$
$u = -0.496798 - 0.288456I$ $a = 0.182003 + 0.761275I$ $b = -1.206810 - 0.297957I$	$0.620620 + 0.259550I$	$-1.58232 + 1.92541I$

IV. $\boldsymbol{I_4^u = \langle u^6 - 2u^4 - u^3 + u^2 + b - 1,\ -2u^9 + 2u^8 + \cdots + a + 5,\ u^{10} - 3u^8 - u^7 + 4u^6 + u^5 - 4u^4 - u^3 + 3u^2 - 1\rangle}$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 2u^9 - 2u^8 - 5u^7 + 4u^6 + 8u^5 - 7u^4 - 8u^3 + 5u^2 + 6u - 5 \\ -u^6 + 2u^4 + u^3 - u^2 + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 2u^9 - 5u^7 - 2u^6 + 5u^5 + u^4 - 4u^3 - u^2 + 3u - 1 \\ -u^9 - u^8 + 2u^7 + 3u^6 - 2u^4 + u^3 + 2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -2u^9 + u^8 + 5u^7 - 6u^5 + u^4 + 5u^3 - 2u^2 - 4u + 3 \\ u^9 + u^8 - 2u^7 - 4u^6 + u^5 + 3u^4 - u^3 - 2u^2 + u + 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 2u^9 - u^8 - 5u^7 + u^6 + 7u^5 - 3u^4 - 7u^3 + 2u^2 + 5u - 3 \\ -u^6 + 2u^4 + u^3 - u^2 + u + 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 2u^9 - u^8 - 5u^7 + u^6 + 7u^5 - 3u^4 - 7u^3 + 2u^2 + 5u - 3 \\ -u^9 + 2u^7 - 2u^5 + 2u^4 + 3u^3 - u^2 - u + 2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -2u^9 + 2u^8 + 5u^7 - 3u^6 - 8u^5 + 4u^4 + 7u^3 - 3u^2 - 5u + 4 \\ -2u^9 - u^8 + 5u^7 + 4u^6 - 4u^5 - 3u^4 + 4u^3 + 3u^2 - 2u - 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -2u^9 + u^8 + 5u^7 - 6u^5 + u^4 + 5u^3 - 2u^2 - 4u + 2 \\ u^9 + u^8 - 2u^7 - 4u^6 + u^5 + 3u^4 - u^3 - 3u^2 + u + 2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -5u^9 + 4u^8 + 15u^7 - 2u^6 - 24u^5 + u^4 + 19u^3 - 2u^2 - 14u - 1$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^5-9y^4-11y^2-5y-1)^2$
c_2, c_5	$(y^5-5y^4+8y^3-7y^2+3y-1)^2$
c_3, c_4, c_7 c_{10}	$y^{10}-6y^9+\cdots-6y+1$
c_6	$(y^5-3y^4+7y^3-8y^2+5y-1)^2$
c_8, c_{11}	$y^{10}-2y^9+\cdots-2y+1$
c_9, c_{12}	$y^{10}-13y^9+38y^8-44y^7+31y^6-29y^5+23y^4-8y^3+7y^2-2y+1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.650832 + 0.640961I$ $a = 2.13970 + 0.29477I$ $b = -0.904429 + 0.339760I$	$1.57933 - 1.42206I$	$-3.99937 + 3.89082I$
$u = 0.650832 - 0.640961I$ $a = 2.13970 - 0.29477I$ $b = -0.904429 - 0.339760I$	$1.57933 + 1.42206I$	$-3.99937 - 3.89082I$
$u = -0.779988 + 0.768157I$ $a = 0.896252 - 0.611916I$ $b = -0.904429 + 0.339760I$	$1.57933 - 1.42206I$	$-3.99937 + 3.89082I$
$u = -0.779988 - 0.768157I$ $a = 0.896252 + 0.611916I$ $b = -0.904429 - 0.339760I$	$1.57933 + 1.42206I$	$-3.99937 - 3.89082I$
$u = 0.799959 + 0.294870I$ $a = -0.603978 - 0.208555I$ $b = 1.116850 + 0.784420I$	$-1.44657 + 3.45949I$	$-8.68875 - 2.10393I$
$u = 0.799959 - 0.294870I$ $a = -0.603978 + 0.208555I$ $b = 1.116850 - 0.784420I$	$-1.44657 - 3.45949I$	$-8.68875 + 2.10393I$
$u = -1.100530 + 0.405664I$ $a = -0.894237 + 0.771397I$ $b = 1.116850 + 0.784420I$	$-1.44657 + 3.45949I$	$-8.68875 - 2.10393I$
$u = -1.100530 - 0.405664I$ $a = -0.894237 - 0.771397I$ $b = 1.116850 - 0.784420I$	$-1.44657 - 3.45949I$	$-8.68875 + 2.10393I$
$u = -0.658694$ $a = -6.32803$ $b = 0.575152$	-6.84525	4.37620
$u = 1.51815$ $a = 0.252548$ $b = 0.575152$	-6.84525	4.37620

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^5-5u^4+8u^3-7u^2+3u-1)^2$ $\cdot(u^9-9u^8+28u^7-51u^6+59u^5-48u^4+29u^3-14u^2+5u-1)$ $\cdot(u^{17}+14u^{16}+\cdots+3584u+1024)(u^{20}+30u^{19}+\cdots+881u+25)^2$
c_2	$(u^5+u^4-2u^3-u^2+u+1)^2$ $\cdot(u^9-u^8-4u^7+u^6+5u^5-2u^4-3u^3+2u^2+u-1)$ $\cdot(u^{17}+10u^{16}+\cdots+160u+32)(u^{20}-4u^{19}+\cdots-9u-5)^2$
c_3, c_{10}	$(u^9-3u^7+5u^5-u^4-5u^3+u^2+2u-1)$ $\cdot(u^{10}-3u^8+\cdots+3u^2-1)(u^{17}-6u^{15}+\cdots+u+1)$ $\cdot(u^{40}-u^{39}+\cdots+24u-9)$
c_4, c_7	$(u^9-3u^7+5u^5+u^4-5u^3-u^2+2u+1)$ $\cdot(u^{10}-3u^8+\cdots+3u^2-1)(u^{17}-6u^{15}+\cdots+u+1)$ $\cdot(u^{40}-u^{39}+\cdots+24u-9)$
c_5	$(u^5-u^4-2u^3+u^2+u-1)^2$ $\cdot(u^9+u^8-4u^7-u^6+5u^5+2u^4-3u^3-2u^2+u+1)$ $\cdot(u^{17}+10u^{16}+\cdots+160u+32)(u^{20}-4u^{19}+\cdots-9u-5)^2$
c_6	$(u^5-u^4-u^3+2u^2+u-1)^2$ $\cdot(u^9+u^8-2u^7-3u^6+2u^5+5u^4-u^3-4u^2+u+1)$ $\cdot(u^{17}-6u^{16}+\cdots-12u+8)(u^{20}+2u^{19}+\cdots+2u-1)^2$
c_8, c_{11}	$(u^9+6u^8+19u^7+40u^6+59u^5+63u^4+47u^3+23u^2+6u+1)$ $\cdot(u^{10}+6u^9+\cdots+6u+1)(u^{17}+12u^{16}+\cdots+7u+1)$ $\cdot(u^{40}+27u^{39}+\cdots-702u+81)$
c_9, c_{12}	$(u^9+4u^8+3u^7-u^6-6u^5-3u^4-u^3+2u^2+u+1)$ $\cdot(u^{10}+u^9-6u^8+4u^7+5u^6-11u^5+5u^4+4u^3-7u^2+4u-1)$ $\cdot(u^{17}+2u^{16}+\cdots+12u+1)(u^{40}+8u^{39}+\cdots-241750u-136681)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^5 - 9y^4 - 11y^2 - 5y - 1)^2$ $\cdot (y^9 - 25y^8 - 16y^7 - 103y^6 - 33y^5 - 48y^4 - 15y^3 - 2y^2 - 3y - 1)$ $\cdot (y^{17} - 22y^{16} + \cdots - 4587520y - 1048576)$ $\cdot (y^{20} - 82y^{19} + \cdots - 403661y + 625)^2$
c_2, c_5	$(y^5 - 5y^4 + 8y^3 - 7y^2 + 3y - 1)^2$ $\cdot (y^9 - 9y^8 + 28y^7 - 51y^6 + 59y^5 - 48y^4 + 29y^3 - 14y^2 + 5y - 1)$ $\cdot (y^{17} - 14y^{16} + \cdots + 3584y - 1024)(y^{20} - 30y^{19} + \cdots - 881y + 25)^2$
c_3, c_4, c_7 c_{10}	$(y^9 - 6y^8 + 19y^7 - 40y^6 + 59y^5 - 63y^4 + 47y^3 - 23y^2 + 6y - 1)$ $\cdot (y^{10} - 6y^9 + \cdots - 6y + 1)(y^{17} - 12y^{16} + \cdots + 7y - 1)$ $\cdot (y^{40} - 27y^{39} + \cdots + 702y + 81)$
c_6	$(y^5 - 3y^4 + 7y^3 - 8y^2 + 5y - 1)^2$ $\cdot (y^9 - 5y^8 + 14y^7 - 29y^6 + 48y^5 - 59y^4 + 51y^3 - 28y^2 + 9y - 1)$ $\cdot (y^{17} - 6y^{16} + \cdots + 720y - 64)(y^{20} - 6y^{19} + \cdots - 26y + 1)^2$
c_8, c_{11}	$(y^9 + 2y^8 - y^7 - 20y^6 - 37y^5 - 47y^4 - 61y^3 - 91y^2 - 10y - 1)$ $\cdot (y^{10} - 2y^9 + \cdots - 2y + 1)(y^{17} - 12y^{16} + \cdots + 19y - 1)$ $\cdot (y^{40} - 19y^{39} + \cdots - 578178y + 6561)$
c_9, c_{12}	$(y^9 - 10y^8 + 5y^7 - 15y^6 + 10y^5 + 5y^4 + 3y^3 - 3y - 1)$ $\cdot (y^{10} - 13y^9 + 38y^8 - 44y^7 + 31y^6 - 29y^5 + 23y^4 - 8y^3 + 7y^2 - 2y + 1)$ $\cdot (y^{17} + 24y^{16} + \cdots + 34y - 1)$ $\cdot (y^{40} - 2y^{39} + \cdots + 22299598078y + 18681695761)$