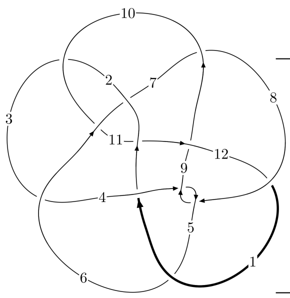
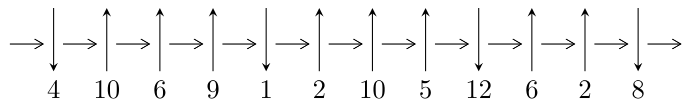
$12n_{0840}$ $(K12n_{0840})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle &-2.20855\times 10^{14}u^{23} + 4.72872\times 10^{15}u^{22} + \cdots + 1.51654\times 10^{16}b + 1.15899\times 10^{17}, \\
&9.05460\times 10^{14}u^{23} - 1.58566\times 10^{16}u^{22} + \cdots + 3.03307\times 10^{16}a - 3.94363\times 10^{17}, \\
&u^{24} - 18u^{23} + \cdots - 1792u + 256\rangle \\
I_2^u = \langle &-9209872u^{16} - 47227765u^{15} + \cdots + 256630152b + 19575099, \\
&-6525033u^{16} - 41835037u^{15} + \cdots + 25630152a - 88967192,\ u^{17} + 5u^{16} + \cdots - 7u + 3\rangle \\
I_3^u = \langle &50u^{28} + 444u^{27} + \cdots + 64b + 198,\ -198u^{28}a + 743u^{28} + \cdots + 3432a - 21508, \\
&u^{29} + 10u^{28} + \cdots - 32u - 2\rangle \\
I_4^u = \langle &au + b + u - 1,\ 6a^2 + 3au + 6a + 2u - 1,\ u^2 + 2\rangle
\end{aligned}$$

$$I_1^v = \langle a,\ b + v,\ v^2 - v + 1\rangle$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 105 representations.

[1]The image of knot diagram is generated by the software "**Draw programme**" developed by Andrew Bartholomew(`http://www.layer8.co.uk/maths/draw/index.htm#Running-draw`), where we modified some parts for our purpose(`https://github.com/CATsTAILs/LinksPainter`).

[2]All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

I. $I_1^u = \langle -2.21 \times 10^{14}u^{23} + 4.73 \times 10^{15}u^{22} + \cdots + 1.52 \times 10^{16}b + 1.16 \times 10^{17},\ 9.05 \times 10^{14}u^{23} - 1.59 \times 10^{16}u^{22} + \cdots + 3.03 \times 10^{16}a - 3.94 \times 10^{17},\ u^{24} - 18u^{23} + \cdots - 1792u + 256\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.0298529u^{23} + 0.522789u^{22} + \cdots - 64.9055u + 13.0021 \\ 0.0145631u^{23} - 0.311811u^{22} + \cdots + 40.4943u - 7.64234 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.00905264u^{23} + 0.149935u^{22} + \cdots - 33.0279u + 6.96109 \\ 0.0130124u^{23} - 0.201731u^{22} + \cdots + 10.2612u - 2.31748 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.0152898u^{23} + 0.210978u^{22} + \cdots - 24.4112u + 5.35977 \\ 0.0145631u^{23} - 0.311811u^{22} + \cdots + 40.4943u - 7.64234 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.0152898u^{23} + 0.210978u^{22} + \cdots - 24.4112u + 5.35977 \\ 0.205024u^{23} - 3.31073u^{22} + \cdots + 151.694u - 24.0872 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -0.0521967u^{23} + 0.896396u^{22} + \cdots - 107.241u + 19.3234 \\ 0.0431440u^{23} - 0.746461u^{22} + \cdots + 75.2130u - 13.3623 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.00905264u^{23} + 0.149935u^{22} + \cdots - 32.0279u + 5.96109 \\ 0.0431440u^{23} - 0.746461u^{22} + \cdots + 75.2130u - 13.3623 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.00666547u^{23} + 0.0871674u^{22} + \cdots - 0.179325u + 0.846328 \\ 0.0610145u^{23} - 0.974137u^{22} + \cdots + 45.9929u - 6.69328 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0.0545990u^{23} - 0.928564u^{22} + \cdots + 37.7724u - 3.48734 \\ 0.146921u^{23} - 2.29092u^{22} + \cdots + 73.7072u - 11.6542 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.0261456u^{23} + 0.409607u^{22} + \cdots - 10.9189u + 0.860033 \\ 0.0481684u^{23} - 0.847385u^{22} + \cdots + 96.6167u - 15.6932 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$$= -\frac{261339848863265}{1421751842414568}u^{23} + \frac{151465938324859}{50776851514806}u^{22} + \cdots - \frac{76152219280730}{533690631537}u + \frac{3978648810812680}{177718980301821}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^{24} - 3u^{23} + \cdots - 12u + 3$
c_2	$u^{24} - 18u^{23} + \cdots - 1792u + 256$
c_3, c_7	$u^{24} + 2u^{23} + \cdots + 9u - 3$
c_4, c_8	$u^{24} - 9u^{23} + \cdots + 44u - 8$
c_5, c_{12}	$3(3u^{24} + 3u^{23} + \cdots - 6u + 1)$
c_6, c_{10}	$3(3u^{24} - 3u^{23} + \cdots - u - 1)$
c_{11}	$9(9u^{24} + 141u^{23} + \cdots + 14728u + 1960)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y^{24} + 3y^{23} + \cdots + 66y + 9$
c_2	$y^{24} - 18y^{23} + \cdots + 262144y + 65536$
c_3, c_7	$y^{24} - 20y^{23} + \cdots + 57y + 9$
c_4, c_8	$y^{24} + 11y^{23} + \cdots + 176y + 64$
c_5, c_{12}	$9(9y^{24} - 87y^{23} + \cdots - 66y + 1)$
c_6, c_{10}	$9(9y^{24} - 303y^{23} + \cdots - 17y + 1)$
c_{11}	$81(81y^{24} - 369y^{23} + \cdots + 1.23041 \times 10^7 y + 3841600)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.530777 + 0.640777I$ $a = 0.265857 + 0.440018I$ $b = 0.140843 - 0.403906I$	$0.26899 + 1.49716I$	$3.11954 - 2.07751I$
$u = 0.530777 - 0.640777I$ $a = 0.265857 - 0.440018I$ $b = 0.140843 + 0.403906I$	$0.26899 - 1.49716I$	$3.11954 + 2.07751I$
$u = 0.688395 + 1.068310I$ $a = 0.206159 - 0.248091I$ $b = -0.406957 - 0.049457I$	$-1.49200 + 3.53503I$	$6.33355 - 5.98826I$
$u = 0.688395 - 1.068310I$ $a = 0.206159 + 0.248091I$ $b = -0.406957 + 0.049457I$	$-1.49200 - 3.53503I$	$6.33355 + 5.98826I$
$u = -0.154209 + 1.284530I$ $a = -0.262592 + 0.372209I$ $b = 0.437620 + 0.394705I$	$-5.06511 + 1.65286I$	$-0.70806 - 3.88591I$
$u = -0.154209 - 1.284530I$ $a = -0.262592 - 0.372209I$ $b = 0.437620 - 0.394705I$	$-5.06511 - 1.65286I$	$-0.70806 + 3.88591I$
$u = 1.278810 + 0.409856I$ $a = -0.843748 + 0.488093I$ $b = 1.279040 - 0.278361I$	$0.75060 + 2.39087I$	$2.55581 - 0.50009I$
$u = 1.278810 - 0.409856I$ $a = -0.843748 - 0.488093I$ $b = 1.279040 + 0.278361I$	$0.75060 - 2.39087I$	$2.55581 + 0.50009I$
$u = 1.42403$ $a = 1.18251$ $b = -1.68393$	3.38392	2.10530
$u = -0.376695 + 0.432151I$ $a = 0.796902 + 0.859648I$ $b = 0.671687 - 0.020557I$	$-0.73124 + 4.01940I$	$4.26636 - 3.12077I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.376695-0.432151I$ $a=0.796902-0.859648I$ $b=0.671687+0.020557I$	$-0.73124-4.01940I$	$4.26636+3.12077I$
$u=-0.38587+1.39561I$ $a=0.132291-0.512227I$ $b=-0.663821-0.382280I$	$1.35141-3.47627I$	$4.76400+8.33538I$
$u=-0.38587-1.39561I$ $a=0.132291+0.512227I$ $b=-0.663821+0.382280I$	$1.35141+3.47627I$	$4.76400-8.33538I$
$u=0.298932+0.404251I$ $a=0.38457-1.82839I$ $b=-0.854090+0.391104I$	$1.36425-1.12274I$	$2.97626+1.52454I$
$u=0.298932-0.404251I$ $a=0.38457+1.82839I$ $b=-0.854090-0.391104I$	$1.36425+1.12274I$	$2.97626-1.52454I$
$u=-0.44722+1.43798I$ $a=-0.070696+0.446274I$ $b=0.610116+0.301240I$	$-2.42080-9.85876I$	$4.00000+7.00757I$
$u=-0.44722-1.43798I$ $a=-0.070696-0.446274I$ $b=0.610116-0.301240I$	$-2.42080+9.85876I$	$4.00000-7.00757I$
$u=1.83440+0.51876I$ $a=1.046860-0.052839I$ $b=-1.94776-0.44614I$	$5.0719+17.4667I$	$0.-8.41645I$
$u=1.83440-0.51876I$ $a=1.046860+0.052839I$ $b=-1.94776+0.44614I$	$5.0719-17.4667I$	$0.+8.41645I$
$u=1.84303+0.56018I$ $a=-1.017100+0.103953I$ $b=1.93278+0.37817I$	$8.5754+11.2460I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.84303 - 0.56018I$ $a = -1.017100 - 0.103953I$ $b = 1.93278 - 0.37817I$	$8.5754 - 11.2460I$	0
$u = 1.94698 + 0.52145I$ $a = 0.908100 - 0.084492I$ $b = -1.81211 - 0.30903I$	$2.43712 + 5.84189I$	0
$u = 1.94698 - 0.52145I$ $a = 0.908100 + 0.084492I$ $b = -1.81211 + 0.30903I$	$2.43712 - 5.84189I$	0
$u = 2.46132$ $a = -0.775702$ $b = 1.90925$	10.9388	0

II.

$\boldsymbol{I_2^u = \langle -9.21\times 10^6 u^{16} - 4.72\times 10^7 u^{15} + \cdots + 2.56\times 10^7 b + 1.96\times 10^7,\ -6.53\times 10^6 u^{16} - 4.18\times 10^7 u^{15} + \cdots + 2.56\times 10^7 a - 8.90\times 10^7,\ u^{17} + 5u^{16} + \cdots - 7u + 3\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.254584u^{16} + 1.63226u^{15} + \cdots - 0.198028u + 3.47119 \\ 0.359337u^{16} + 1.84266u^{15} + \cdots + 5.25328u - 0.763753 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.0880697u^{16} - 0.334155u^{15} + \cdots - 5.22509u + 4.77122 \\ 0.106193u^{16} + 0.569279u^{15} + \cdots + 3.15474u + 0.264209 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.613922u^{16} + 3.47492u^{15} + \cdots + 5.05525u + 2.70744 \\ 0.359337u^{16} + 1.84266u^{15} + \cdots + 5.25328u - 0.763753 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.613922u^{16} + 3.47492u^{15} + \cdots + 5.05525u + 2.70744 \\ 0.400116u^{16} + 2.15432u^{15} + \cdots + 4.25784u + 0.452191 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.171796u^{16} + 0.775254u^{15} + \cdots + 7.27835u - 3.25584 \\ -0.0837263u^{16} - 0.441098u^{15} + \cdots - 1.05326u - 0.515388 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 0.0880697u^{16} + 0.334155u^{15} + \cdots + 6.22509u - 3.77122 \\ -0.0837263u^{16} - 0.441098u^{15} + \cdots - 1.05326u - 0.515388 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -0.351457u^{16} - 1.90179u^{15} + \cdots - 7.26298u - 1.70210 \\ -0.127546u^{16} - 0.667421u^{15} + \cdots - 4.20513u + 0.620853 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -0.689667u^{16} - 3.43906u^{15} + \cdots - 8.87737u + 1.25219 \\ -0.147048u^{16} - 0.564321u^{15} + \cdots - 3.95783u + 1.01883 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.206951u^{16} + 1.16230u^{15} + \cdots + 3.10068u + 2.75647 \\ 0.0662469u^{16} + 0.354221u^{15} + \cdots + 3.83737u - 0.103532 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= \frac{17990383}{25630152}u^{16} + \frac{100459123}{25630152}u^{15} + \cdots + \frac{531682607}{25630152}u - \frac{2019718}{1067923}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^{17} - 3u^{16} + \cdots - 28u + 12$
c_2	$u^{17} + 5u^{16} + \cdots - 7u + 3$
c_3, c_7	$u^{17} + 2u^{16} + \cdots + 60u + 36$
c_4	$u^{17} - 4u^{16} + \cdots + 2u - 3$
c_5, c_{12}	$4(4u^{17} - 4u^{16} + \cdots + 2u - 1)$
c_6, c_{10}	$4(4u^{17} + 4u^{16} + \cdots - 3u + 1)$
c_8	$u^{17} + 4u^{16} + \cdots + 2u + 3$
c_{11}	$16(16u^{17} + 112u^{16} + \cdots + 33u + 33)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y^{17} + 3y^{16} + \cdots - 32y - 144$
c_2	$y^{17} - 17y^{16} + \cdots - 137y - 9$
c_3, c_7	$y^{17} - 12y^{16} + \cdots - 3168y - 1296$
c_4, c_8	$y^{17} + 8y^{16} + \cdots - 62y - 9$
c_5, c_{12}	$16(16y^{17} - 64y^{16} + \cdots - 4y - 1)$
c_6, c_{10}	$16(16y^{17} - 192y^{16} + \cdots - 17y - 1)$
c_{11}	$256(256y^{17} - 1408y^{16} + \cdots + 1749y - 1089)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.202685 + 0.958929I$ $a = -0.101984 + 0.631097I$ $b = -0.625848 + 0.030119I$	$1.15527 + 2.33712I$	$4.92657 - 5.08042I$
$u = 0.202685 - 0.958929I$ $a = -0.101984 - 0.631097I$ $b = -0.625848 - 0.030119I$	$1.15527 - 2.33712I$	$4.92657 + 5.08042I$
$u = 0.442788 + 0.854378I$ $a = -0.605348 - 0.519672I$ $b = 0.175955 - 0.747300I$	$-6.09745 + 0.34180I$	$-6.54411 + 0.10551I$
$u = 0.442788 - 0.854378I$ $a = -0.605348 + 0.519672I$ $b = 0.175955 + 0.747300I$	$-6.09745 - 0.34180I$	$-6.54411 - 0.10551I$
$u = 0.933842 + 0.546353I$ $a = -0.320613 - 0.343229I$ $b = -0.111878 - 0.495690I$	$-1.10631 + 1.98360I$	$-1.30446 - 2.82949I$
$u = 0.933842 - 0.546353I$ $a = -0.320613 + 0.343229I$ $b = -0.111878 + 0.495690I$	$-1.10631 - 1.98360I$	$-1.30446 + 2.82949I$
$u = 0.844311 + 0.930797I$ $a = 0.286806 + 0.217633I$ $b = 0.039581 + 0.450708I$	$-2.00645 + 3.18660I$	$-4.32554 + 0.79064I$
$u = 0.844311 - 0.930797I$ $a = 0.286806 - 0.217633I$ $b = 0.039581 - 0.450708I$	$-2.00645 - 3.18660I$	$-4.32554 - 0.79064I$
$u = -0.116566 + 0.581560I$ $a = -1.71456 + 0.09351I$ $b = 0.145475 - 1.008020I$	$-4.77665 - 10.19610I$	$-2.01174 + 7.98398I$
$u = -0.116566 - 0.581560I$ $a = -1.71456 - 0.09351I$ $b = 0.145475 + 1.008020I$	$-4.77665 + 10.19610I$	$-2.01174 - 7.98398I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.135915 + 0.400426I$ $a = 1.80918 + 1.26166I$ $b = -0.259307 + 0.895924I$	$-1.32003 - 4.67660I$	$-0.03284 + 6.45930I$
$u = 0.135915 - 0.400426I$ $a = 1.80918 - 1.26166I$ $b = -0.259307 - 0.895924I$	$-1.32003 + 4.67660I$	$-0.03284 - 6.45930I$
$u = -1.66080 + 0.20153I$ $a = -1.167840 + 0.110611I$ $b = 1.91726 - 0.41906I$	$7.89276 - 6.13727I$	$5.32681 + 4.36806I$
$u = -1.66080 - 0.20153I$ $a = -1.167840 - 0.110611I$ $b = 1.91726 + 0.41906I$	$7.89276 + 6.13727I$	$5.32681 - 4.36806I$
$u = -2.02550 + 0.14114I$ $a = 0.861774 - 0.051839I$ $b = -1.73821 + 0.22663I$	$4.12908 - 6.62683I$	$4.11488 + 6.30699I$
$u = -2.02550 - 0.14114I$ $a = 0.861774 + 0.051839I$ $b = -1.73821 - 0.22663I$	$4.12908 + 6.62683I$	$4.11488 - 6.30699I$
$u = -2.51334$ $a = -0.761514$ $b = 1.91394$	10.8393	-38.2990

III. $\boldsymbol{I^u_3 = \langle 50u^{28} + 444u^{27} + \cdots + 64b + 198,\ -198u^{28}a + 743u^{28} + \cdots + 3432a - 21508,\ u^{29} + 10u^{28} + \cdots - 32u - 2\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} a \\ -0.781250u^{28} - 6.93750u^{27} + \cdots - 22.6875u - 3.09375 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.875000au^{28} + 0.343750u^{28} + \cdots - 1.56250a + 14.1875 \\ -0.875000au^{28} + 0.695313u^{28} + \cdots + 1.56250a - 1.07813 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.781250u^{28} - 6.93750u^{27} + \cdots + a - 3.09375 \\ -0.781250u^{28} - 6.93750u^{27} + \cdots - 22.6875u - 3.09375 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.781250u^{28} - 6.93750u^{27} + \cdots + a - 3.09375 \\ -0.140625u^{28} - 0.968750u^{27} + \cdots - 49.1250u - 4.84375 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.781250au^{28} - 0.789063u^{28} + \cdots + 3.09375a - 11.6094 \\ 0.445313u^{28} + 4.37500u^{27} + \cdots - 35.8594u - 1.57813 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.781250au^{28} - 0.343750u^{28} + \cdots + 3.09375a - 13.1875 \\ 0.445313u^{28} + 4.37500u^{27} + \cdots - 35.8594u - 1.57813 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.250000au^{28} - 1.92188u^{28} + \cdots + 4.59375a - 18.5000 \\ \frac{5}{32}u^{28}a - \frac{9}{8}u^{28} + \cdots - \frac{7}{32}a + \frac{67}{32} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.453125au^{28} - 2.57031u^{28} + \cdots - 0.750000a + 61.4063 \\ 0.281250au^{28} + 1.63281u^{28} + \cdots - 0.625000a - 1.26563 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.109375au^{28} + 1.07813u^{28} + \cdots - 5.09375a + 21.3125 \\ 0.937500au^{28} - 0.242188u^{28} + \cdots - 3.62500a - 0.0156250 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{77}{32}u^{28} + \frac{169}{8}u^{27} + \cdots + \frac{1}{16}u + \frac{15}{8}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^{58} - 8u^{57} + \cdots - 7380u + 484$
c_2	$(u^{29} + 10u^{28} + \cdots - 32u - 2)^2$
c_3, c_7	$u^{58} + 12u^{57} + \cdots + 3588u + 3484$
c_4, c_8	$(u^{29} + 4u^{28} + \cdots + 10u + 2)^2$
c_5, c_{12}	$4(4u^{58} + 8u^{57} + \cdots + 623u + 131)$
c_6, c_{10}	$4(4u^{58} - 8u^{57} + \cdots + 16111u + 3551)$
c_{11}	$16(4u^{29} - 54u^{28} + \cdots - 525u + 167)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y^{58} + 2y^{57} + \cdots + 1251744y + 234256$
c_2	$(y^{29} - 38y^{28} + \cdots + 144y - 4)^2$
c_3, c_7	$y^{58} - 30y^{57} + \cdots - 6839456y + 12138256$
c_4, c_8	$(y^{29} + 20y^{28} + \cdots - 44y - 4)^2$
c_5, c_{12}	$16(16y^{58} + 48y^{57} + \cdots - 58009y + 17161)$
c_6, c_{10}	$16(16y^{58} - 976y^{57} + \cdots + 3.82329 \times 10^8 y + 1.26096 \times 10^7)$
c_{11}	$256(16y^{29} - 428y^{28} + \cdots + 272619y - 27889)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.912216 + 0.585428I$ $a = 0.675374 - 0.268010I$ $b = -0.261923 + 0.728143I$	$-1.57846 + 4.29036I$	$-0.46910 - 8.73987I$
$u = 0.912216 + 0.585428I$ $a = -0.159461 - 0.695877I$ $b = -0.772988 - 0.150900I$	$-1.57846 + 4.29036I$	$-0.46910 - 8.73987I$
$u = 0.912216 - 0.585428I$ $a = 0.675374 + 0.268010I$ $b = -0.261923 - 0.728143I$	$-1.57846 - 4.29036I$	$-0.46910 + 8.73987I$
$u = 0.912216 - 0.585428I$ $a = -0.159461 + 0.695877I$ $b = -0.772988 + 0.150900I$	$-1.57846 - 4.29036I$	$-0.46910 + 8.73987I$
$u = 0.618541 + 0.519711I$ $a = 0.666375 + 0.683260I$ $b = 0.182291 - 0.200504I$	$0.26701 + 1.60185I$	$5.56020 - 2.94171I$
$u = 0.618541 + 0.519711I$ $a = -0.013100 + 0.335163I$ $b = -0.057082 - 0.768947I$	$0.26701 + 1.60185I$	$5.56020 - 2.94171I$
$u = 0.618541 - 0.519711I$ $a = 0.666375 - 0.683260I$ $b = 0.182291 + 0.200504I$	$0.26701 - 1.60185I$	$5.56020 + 2.94171I$
$u = 0.618541 - 0.519711I$ $a = -0.013100 - 0.335163I$ $b = -0.057082 + 0.768947I$	$0.26701 - 1.60185I$	$5.56020 + 2.94171I$
$u = -0.637964 + 0.411709I$ $a = -0.223297 + 0.131875I$ $b = -0.57825 - 1.30385I$	$-0.23811 + 4.12161I$	$7.82602 - 2.63486I$
$u = -0.637964 + 0.411709I$ $a = 0.29124 - 1.85581I$ $b = -0.088162 + 0.176065I$	$-0.23811 + 4.12161I$	$7.82602 - 2.63486I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.637964-0.411709I$ $a=-0.223297-0.131875I$ $b=-0.57825+1.30385I$	$-0.23811-4.12161I$	$7.82602+2.63486I$
$u=-0.637964-0.411709I$ $a=\quad 0.29124+1.85581I$ $b=-0.088162-0.176065I$	$-0.23811-4.12161I$	$7.82602+2.63486I$
$u=-0.624381+0.324404I$ $a=\quad 0.599713-0.357478I$ $b=\quad 0.56058+1.50487I$	$-3.46043+9.57152I$	$4.68334-5.35627I$
$u=-0.624381+0.324404I$ $a=-0.27908+2.26519I$ $b=\quad 0.258482-0.417751I$	$-3.46043+9.57152I$	$4.68334-5.35627I$
$u=-0.624381-0.324404I$ $a=\quad 0.599713+0.357478I$ $b=\quad 0.56058-1.50487I$	$-3.46043-9.57152I$	$4.68334+5.35627I$
$u=-0.624381-0.324404I$ $a=-0.27908-2.26519I$ $b=\quad 0.258482+0.417751I$	$-3.46043-9.57152I$	$4.68334+5.35627I$
$u=-0.445198+0.435124I$ $a=\quad 0.413859+0.679908I$ $b=\quad 0.176153+1.266900I$	$-5.07047-0.16816I$	$2.60672-1.18920I$
$u=-0.445198+0.435124I$ $a=-1.22011+1.65319I$ $b=\quad 0.480093+0.122614I$	$-5.07047-0.16816I$	$2.60672-1.18920I$
$u=-0.445198-0.435124I$ $a=\quad 0.413859-0.679908I$ $b=\quad 0.176153-1.266900I$	$-5.07047+0.16816I$	$2.60672+1.18920I$
$u=-0.445198-0.435124I$ $a=-1.22011-1.65319I$ $b=\quad 0.480093-0.122614I$	$-5.07047+0.16816I$	$2.60672+1.18920I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.040804 + 1.377650I$ $a = -1.056440 + 0.006297I$ $b = 0.677724 + 0.153812I$	$-4.92375 + 0.51981I$	$0.77865 - 14.11985I$
$u = -0.040804 + 1.377650I$ $a = -0.096993 + 0.494816I$ $b = -0.03443 + 1.45565I$	$-4.92375 + 0.51981I$	$0.77865 - 14.11985I$
$u = -0.040804 - 1.377650I$ $a = -1.056440 - 0.006297I$ $b = 0.677724 - 0.153812I$	$-4.92375 - 0.51981I$	$0.77865 + 14.11985I$
$u = -0.040804 - 1.377650I$ $a = -0.096993 - 0.494816I$ $b = -0.03443 - 1.45565I$	$-4.92375 - 0.51981I$	$0.77865 + 14.11985I$
$u = 0.595003 + 0.172391I$ $a = -0.238046 + 1.232310I$ $b = -0.220914 - 0.822274I$	$0.79583 + 1.58851I$	$8.05301 - 4.96467I$
$u = 0.595003 + 0.172391I$ $a = 0.711919 + 1.175700I$ $b = 0.354077 - 0.692191I$	$0.79583 + 1.58851I$	$8.05301 - 4.96467I$
$u = 0.595003 - 0.172391I$ $a = -0.238046 - 1.232310I$ $b = -0.220914 + 0.822274I$	$0.79583 - 1.58851I$	$8.05301 + 4.96467I$
$u = 0.595003 - 0.172391I$ $a = 0.711919 - 1.175700I$ $b = 0.354077 + 0.692191I$	$0.79583 - 1.58851I$	$8.05301 + 4.96467I$
$u = -1.39792 + 0.49312I$ $a = -0.889514 - 0.603962I$ $b = 1.65241 - 0.35905I$	$5.42820 + 1.19904I$	$8.46180 + 0.I$
$u = -1.39792 + 0.49312I$ $a = 1.131820 + 0.142409I$ $b = -1.54129 - 0.40565I$	$5.42820 + 1.19904I$	$8.46180 + 0.I$

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.39792 - 0.49312I$ $a = -0.889514 + 0.603962I$ $b = 1.65241 + 0.35905I$	$5.42820 - 1.19904I$	$8.46180 + 0.I$
$u = -1.39792 - 0.49312I$ $a = 1.131820 - 0.142409I$ $b = -1.54129 + 0.40565I$	$5.42820 - 1.19904I$	$8.46180 + 0.I$
$u = -1.62739 + 0.37476I$ $a = 0.950086 + 0.262975I$ $b = -1.88014 + 0.44823I$	$7.16635 - 4.11940I$	0
$u = -1.62739 + 0.37476I$ $a = -1.157360 + 0.008903I$ $b = 1.64471 + 0.07190I$	$7.16635 - 4.11940I$	0
$u = -1.62739 - 0.37476I$ $a = 0.950086 - 0.262975I$ $b = -1.88014 - 0.44823I$	$7.16635 + 4.11940I$	0
$u = -1.62739 - 0.37476I$ $a = -1.157360 - 0.008903I$ $b = 1.64471 - 0.07190I$	$7.16635 + 4.11940I$	0
$u = -1.70107 + 0.22060I$ $a = 1.131150 + 0.020130I$ $b = -1.91034 + 0.46562I$	$8.43792 - 4.79047I$	0
$u = -1.70107 + 0.22060I$ $a = -1.139360 + 0.125968I$ $b = 1.92860 - 0.21529I$	$8.43792 - 4.79047I$	0
$u = -1.70107 - 0.22060I$ $a = 1.131150 - 0.020130I$ $b = -1.91034 - 0.46562I$	$8.43792 + 4.79047I$	0
$u = -1.70107 - 0.22060I$ $a = -1.139360 - 0.125968I$ $b = 1.92860 + 0.21529I$	$8.43792 + 4.79047I$	0

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.74292 + 0.20742I$ $a = 1.041960 - 0.156952I$ $b = -2.01087 + 0.35947I$	$7.62859 - 7.68544I$	0
$u = -1.74292 + 0.20742I$ $a = -1.161830 + 0.067978I$ $b = 1.78350 - 0.48968I$	$7.62859 - 7.68544I$	0
$u = -1.74292 - 0.20742I$ $a = 1.041960 + 0.156952I$ $b = -2.01087 - 0.35947I$	$7.62859 + 7.68544I$	0
$u = -1.74292 - 0.20742I$ $a = -1.161830 - 0.067978I$ $b = 1.78350 + 0.48968I$	$7.62859 + 7.68544I$	0
$u = -0.1103580 + 0.0869906I$ $a = -0.31613 - 7.51279I$ $b = 0.535049 - 1.059640I$	$-1.30167 - 0.70742I$	$0.34305 + 1.38757I$
$u = -0.1103580 + 0.0869906I$ $a = 7.65845 - 3.56497I$ $b = -0.688429 - 0.801592I$	$-1.30167 - 0.70742I$	$0.34305 + 1.38757I$
$u = -0.1103580 - 0.0869906I$ $a = -0.31613 + 7.51279I$ $b = 0.535049 + 1.059640I$	$-1.30167 + 0.70742I$	$0.34305 - 1.38757I$
$u = -0.1103580 - 0.0869906I$ $a = 7.65845 + 3.56497I$ $b = -0.688429 + 0.801592I$	$-1.30167 + 0.70742I$	$0.34305 - 1.38757I$
$u = -1.83815 + 0.38020I$ $a = 1.079450 - 0.054355I$ $b = -1.405120 + 0.141930I$	$2.19953 - 7.64350I$	0
$u = -1.83815 + 0.38020I$ $a = -0.748373 - 0.077577I$ $b = 1.96353 - 0.51032I$	$2.19953 - 7.64350I$	0

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.83815 - 0.38020I$ $a = 1.079450 + 0.054355I$ $b = -1.405120 - 0.141930I$	$2.19953 + 7.64350I$	0
$u = -1.83815 - 0.38020I$ $a = -0.748373 + 0.077577I$ $b = 1.96353 + 0.51032I$	$2.19953 + 7.64350I$	0
$u = 2.01903$ $a = -0.873906 + 0.128847I$ $b = 1.76444 + 0.26015I$	10.1337	0
$u = 2.01903$ $a = -0.873906 - 0.128847I$ $b = 1.76444 - 0.26015I$	10.1337	0
$u = 2.03087 + 0.14541I$ $a = 0.965885 + 0.090036I$ $b = -1.56320 + 0.28729I$	$5.90158 - 5.80201I$	0
$u = 2.03087 + 0.14541I$ $a = 0.755716 - 0.195570I$ $b = -1.94850 - 0.32330I$	$5.90158 - 5.80201I$	0
$u = 2.03087 - 0.14541I$ $a = 0.965885 - 0.090036I$ $b = -1.56320 - 0.28729I$	$5.90158 + 5.80201I$	0
$u = 2.03087 - 0.14541I$ $a = 0.755716 + 0.195570I$ $b = -1.94850 + 0.32330I$	$5.90158 + 5.80201I$	0

IV. $I_4^u = \langle au + b + u - 1,\ 6a^2 + 3au + 6a + 2u - 1,\ u^2 + 2\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_3, c_7 c_9	$y^4 - 14y^3 + 55y^2 + 30y + 9$
c_2, c_4, c_8	$(y+2)^4$
c_5, c_6, c_{10} c_{12}	$9(9y^4 + 30y^3 + 19y^2 - 34y + 9)$
c_{11}	$81(9y^2 + 2y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.414210I$ $a = -1.050570 - 0.246526I$ $b = 0.651360 + 0.071509I$	-4.93480	0
$u = 1.414210I$ $a = 0.050565 - 0.460581I$ $b = 0.34864 - 1.48572I$	-4.93480	0
$u = -1.414210I$ $a = -1.050570 + 0.246526I$ $b = 0.651360 - 0.071509I$	-4.93480	0
$u = -1.414210I$ $a = 0.050565 + 0.460581I$ $b = 0.34864 + 1.48572I$	-4.93480	0

V. $I_1^v = \langle a,\ b+v,\ v^2-v+1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}v\\0\end{pmatrix}$$
$$a_3 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0\\-v\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\-v+1\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-v\\-v\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-v+1\\-v\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}v\\1\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}v+1\\1\end{pmatrix}$$
$$a_1 = \begin{pmatrix}v\\v\end{pmatrix}$$
$$a_5 = \begin{pmatrix}1\\-v+1\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-v+1\\-v\end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 0.500000 + 0.866025I$ $a = 0$ $b = -0.500000 - 0.866025I$	0	6.00000
$v = 0.500000 - 0.866025I$ $a = 0$ $b = -0.500000 + 0.866025I$	0	6.00000

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_9	$(u^2-u+1)(u^4-6u^3+\cdots-6u+3)(u^{17}-3u^{16}+\cdots-28u+12)$ $\cdot(u^{24}-3u^{23}+\cdots-12u+3)(u^{58}-8u^{57}+\cdots-7380u+484)$
c_2	$u^2(u^2+2)^2(u^{17}+5u^{16}+\cdots-7u+3)$ $\cdot(u^{24}-18u^{23}+\cdots-1792u+256)(u^{29}+10u^{28}+\cdots-32u-2)^2$
c_3, c_7	$(u^2+u+1)(u^4-6u^3+\cdots-6u+3)(u^{17}+2u^{16}+\cdots+60u+36)$ $\cdot(u^{24}+2u^{23}+\cdots+9u-3)(u^{58}+12u^{57}+\cdots+3588u+3484)$
c_4	$u^2(u^2+2)^2(u^{17}-4u^{16}+\cdots+2u-3)(u^{24}-9u^{23}+\cdots+44u-8)$ $\cdot(u^{29}+4u^{28}+\cdots+10u+2)^2$
c_5, c_{12}	$144(u^2+u+1)(3u^4-6u^3+\cdots-10u+3)(4u^{17}-4u^{16}+\cdots+2u-1)$ $\cdot(3u^{24}+3u^{23}+\cdots-6u+1)(4u^{58}+8u^{57}+\cdots+623u+131)$
c_6, c_{10}	$144(u^2-u+1)(3u^4+6u^3+\cdots+10u+3)(4u^{17}+4u^{16}+\cdots-3u+1)$ $\cdot(3u^{24}-3u^{23}+\cdots-u-1)(4u^{58}-8u^{57}+\cdots+16111u+3551)$
c_8	$u^2(u^2+2)^2(u^{17}+4u^{16}+\cdots+2u+3)(u^{24}-9u^{23}+\cdots+44u-8)$ $\cdot(u^{29}+4u^{28}+\cdots+10u+2)^2$
c_{11}	$20736(u+1)^2(3u^2+2u+1)^2(16u^{17}+112u^{16}+\cdots+33u+33)$ $\cdot(9u^{24}+141u^{23}+\cdots+14728u+1960)$ $\cdot(4u^{29}-54u^{28}+\cdots-525u+167)^2$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_9	$(y^2+y+1)(y^4-14y^3+\cdots+30y+9)(y^{17}+3y^{16}+\cdots-32y-144)$ $\cdot(y^{24}+3y^{23}+\cdots+66y+9)(y^{58}+2y^{57}+\cdots+1251744y+234256)$
c_2	$y^2(y+2)^4(y^{17}-17y^{16}+\cdots-137y-9)$ $\cdot(y^{24}-18y^{23}+\cdots+262144y+65536)$ $\cdot(y^{29}-38y^{28}+\cdots+144y-4)^2$
c_3, c_7	$(y^2+y+1)(y^4-14y^3+55y^2+30y+9)$ $\cdot(y^{17}-12y^{16}+\cdots-3168y-1296)(y^{24}-20y^{23}+\cdots+57y+9)$ $\cdot(y^{58}-30y^{57}+\cdots-6839456y+12138256)$
c_4, c_8	$y^2(y+2)^4(y^{17}+8y^{16}+\cdots-62y-9)(y^{24}+11y^{23}+\cdots+176y+64)$ $\cdot(y^{29}+20y^{28}+\cdots-44y-4)^2$
c_5, c_{12}	$20736(y^2+y+1)(9y^4+30y^3+19y^2-34y+9)$ $\cdot(16y^{17}-64y^{16}+\cdots-4y-1)(9y^{24}-87y^{23}+\cdots-66y+1)$ $\cdot(16y^{58}+48y^{57}+\cdots-58009y+17161)$
c_6, c_{10}	$20736(y^2+y+1)(9y^4+30y^3+19y^2-34y+9)$ $\cdot(16y^{17}-192y^{16}+\cdots-17y-1)(9y^{24}-303y^{23}+\cdots-17y+1)$ $\cdot(16y^{58}-976y^{57}+\cdots+382328643y+12609601)$
c_{11}	$429981696(y-1)^2(9y^2+2y+1)^2$ $\cdot(256y^{17}-1408y^{16}+\cdots+1749y-1089)$ $\cdot(81y^{24}-369y^{23}+\cdots+12304096y+3841600)$ $\cdot(16y^{29}-428y^{28}+\cdots+272619y-27889)^2$