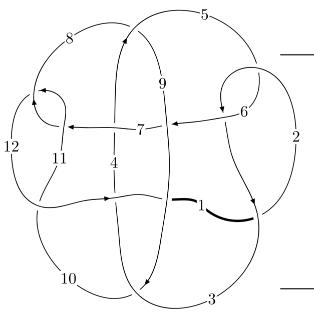
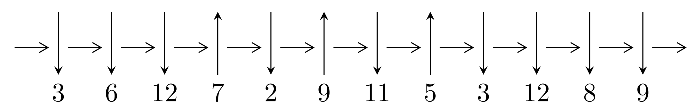
$12n_{0508}$ ($K12n_{0508}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I^u_1 &= \langle -11u^{14} + 3u^{13} + \cdots + 36b + 14,\ -u^{14} + 3u^{13} + \cdots + 12a - 8, \\
&\quad u^{15} + 2u^{14} - 2u^{13} - 5u^{12} + 4u^{11} + 9u^{10} + u^9 + u^8 + 3u^7 - 4u^6 + 5u^5 + 21u^4 + 16u^3 + 4u^2 - 2\rangle \\
I^u_2 &= \langle -7u^{24} + 2u^{23} + \cdots + 32b + 140,\ -47u^{25} - 117u^{24} + \cdots + 368a + 2737,\ u^{26} + 2u^{25} + \cdots - 46u - 23\rangle \\
I^u_3 &= \langle u^3 - u^2 + 2b,\ -u^2 + 2a + u,\ u^4 - u^2 + 2\rangle \\
I^u_4 &= \langle 4b^2 - 4b - 32u + 33,\ 2bu - 2b - u + 1,\ 2a + 1,\ u^2 - 2u + 1\rangle \\
I^u_5 &= \langle -u^3 + u^2 + 2b - u + 1,\ u^3 + u^2 + 2a - u + 1,\ u^4 + 1\rangle \\
I^u_6 &= \langle -a^2 + b - 2a,\ a^3 + 2a^2 + a + 1,\ u - 1\rangle \\
I^u_7 &= \langle ba - a^2 + a + 1,\ u - 1\rangle \\
I^u_8 &= \langle b - a - 1,\ u - 1\rangle
\end{aligned}$$

$$\begin{aligned}
I^v_1 &= \langle a,\ b^3 - b - 1,\ v - 1\rangle \\
I^v_2 &= \langle a,\ b + 1,\ v - 1\rangle
\end{aligned}$$

* 8 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 59 representations.
* 2 irreducible components of $\dim_{\mathbb{C}} = 1$

[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. $I_1^u = \langle -11u^{14} + 3u^{13} + \cdots + 36b + 14,\ -u^{14} + 3u^{13} + \cdots + 12a - 8,\ u^{15} + 2u^{14} + \cdots + 4u^2 - 2\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{12}u^{14} - \frac{1}{4}u^{13} + \cdots + \frac{1}{6}u + \frac{2}{3} \\ \frac{11}{36}u^{14} - \frac{1}{12}u^{13} + \cdots - \frac{8}{9}u - \frac{7}{18} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} \frac{1}{4}u^{12} - \frac{3}{4}u^{10} + \cdots + \frac{1}{2}u - \frac{1}{2} \\ \frac{1}{12}u^{14} - \frac{1}{4}u^{13} + \cdots + \frac{2}{3}u + \frac{1}{6} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{13}{36}u^{14} + \frac{1}{3}u^{13} + \cdots + \frac{11}{9}u + \frac{2}{9} \\ \frac{1}{12}u^{14} - \frac{5}{12}u^{12} + \cdots - \frac{1}{3}u - \frac{1}{3} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -\frac{1}{2}u^{14} - \frac{1}{2}u^{13} + \cdots - u + \frac{3}{2} \\ -\frac{1}{2}u^{14} - \frac{1}{2}u^{13} + \cdots - \frac{1}{2}u + 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.388889u^{14} - 0.416667u^{13} + \cdots - 0.277778u + 1.22222 \\ -\frac{1}{6}u^{14} - \frac{1}{4}u^{13} + \cdots - \frac{4}{3}u + \frac{1}{6} \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} \frac{1}{2}u^6 - \frac{1}{2}u^4 + \frac{1}{2}u^3 + 1 \\ \frac{1}{12}u^{14} - \frac{5}{12}u^{12} + \cdots - \frac{1}{3}u - \frac{1}{3} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} \frac{13}{36}u^{14} + \frac{1}{3}u^{13} + \cdots + \frac{11}{9}u + \frac{2}{9} \\ \frac{1}{6}u^{14} + \frac{1}{4}u^{13} + \cdots - \frac{1}{6}u - \frac{2}{3} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{28}{27}u^{14} - \frac{8}{9}u^{13} - \frac{134}{27}u^{12} + \frac{104}{27}u^{11} + 10u^{10} - \frac{26}{3}u^9 - \frac{206}{27}u^8 + \frac{200}{27}u^7 - \frac{148}{27}u^6 - \frac{98}{27}u^5 + \frac{158}{9}u^4 - \frac{8}{3}u^3 - \frac{488}{27}u^2 - \frac{214}{27}u - \frac{160}{27}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{15} + 8u^{14} + \cdots + 16u + 4$
c_2, c_5, c_7 c_{11}	$u^{15} - 2u^{14} + \cdots - 4u^2 + 2$
c_3, c_{12}	$2(2u^{15} - 6u^{14} + \cdots - 9u + 3)$
c_4, c_6	$2(2u^{15} + 2u^{14} + \cdots + 27u + 3)$
c_8	$3(3u^{15} - 18u^{14} + \cdots + 11u + 7)$
c_9	$3(3u^{15} + 18u^{14} + \cdots - 17u + 7)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{15} + 32y^{13} + \cdots + 800y - 16$
c_2, c_5, c_7 c_{11}	$y^{15} - 8y^{14} + \cdots + 16y - 4$
c_3, c_{12}	$4(4y^{15} - 104y^{14} + \cdots + 249y - 9)$
c_4, c_6	$4(4y^{15} + 56y^{14} + \cdots + 717y - 9)$
c_8	$9(9y^{15} - 24y^{14} + \cdots + 555y - 49)$
c_9	$9(9y^{15} - 168y^{14} + \cdots - 229y - 49)$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.144120 + 1.054560I$ $a = -1.219520 + 0.251203I$ $b = -0.305685 - 0.517647I$	$-5.10750 + 3.19553I$	$-5.98942 - 2.06971I$
$u = 0.144120 - 1.054560I$ $a = -1.219520 - 0.251203I$ $b = -0.305685 + 0.517647I$	$-5.10750 - 3.19553I$	$-5.98942 + 2.06971I$
$u = -0.928567 + 0.624096I$ $a = -0.420023 + 0.318850I$ $b = 0.348565 + 0.966858I$	$2.54442 + 5.04477I$	$-0.58192 - 5.69711I$
$u = -0.928567 - 0.624096I$ $a = -0.420023 - 0.318850I$ $b = 0.348565 - 0.966858I$	$2.54442 - 5.04477I$	$-0.58192 + 5.69711I$
$u = 1.007800 + 0.747753I$ $a = 0.553989 + 0.660683I$ $b = 0.448740 + 1.074590I$	$-0.77508 - 5.73977I$	$-11.31279 + 5.82144I$
$u = 1.007800 - 0.747753I$ $a = 0.553989 - 0.660683I$ $b = 0.448740 - 1.074590I$	$-0.77508 + 5.73977I$	$-11.31279 - 5.82144I$
$u = -1.203300 + 0.403095I$ $a = -0.438882 - 1.115720I$ $b = -0.88076 - 2.14220I$	$-4.79918 + 9.00906I$	$-10.02265 - 8.13965I$
$u = -1.203300 - 0.403095I$ $a = -0.438882 + 1.115720I$ $b = -0.88076 + 2.14220I$	$-4.79918 - 9.00906I$	$-10.02265 + 8.13965I$
$u = -0.189655 + 0.562206I$ $a = 1.23134 + 1.07625I$ $b = 0.232219 - 0.118314I$	$1.46040 - 1.17055I$	$1.25283 + 2.21107I$
$u = -0.189655 - 0.562206I$ $a = 1.23134 - 1.07625I$ $b = 0.232219 + 0.118314I$	$1.46040 + 1.17055I$	$1.25283 - 2.21107I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.346970 + 0.412511I$ $a = 0.057661 + 0.976830I$ $b = -0.68130 + 1.78913I$	$-14.7969 + 6.7928I$	$-12.44195 - 4.01641I$
$u = -1.346970 - 0.412511I$ $a = 0.057661 - 0.976830I$ $b = -0.68130 - 1.78913I$	$-14.7969 - 6.7928I$	$-12.44195 + 4.01641I$
$u = 1.32413 + 0.56114I$ $a = 0.09611 - 1.50736I$ $b = 0.69422 - 2.43940I$	$-12.5822 - 14.8536I$	$-10.17186 + 7.59627I$
$u = 1.32413 - 0.56114I$ $a = 0.09611 + 1.50736I$ $b = 0.69422 + 2.43940I$	$-12.5822 + 14.8536I$	$-10.17186 - 7.59627I$
$u = 0.384887$ $a = 0.278645$ $b = -0.711991$	-0.975030	-11.4640

II. $\boldsymbol{I_2^u = \langle -7u^{24} + 2u^{23} + \cdots + 32b + 140,\ -47u^{25} - 117u^{24} + \cdots + 368a + 2737,\ u^{26} + 2u^{25} + \cdots - 46u - 23\rangle}$

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} 0.127717u^{25} + 0.317935u^{24} + \cdots - 4.13587u - 7.43750 \\ \frac{7}{32}u^{24} - \frac{1}{16}u^{23} + \cdots - \frac{23}{32}u - \frac{35}{8} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.535326u^{25} + 0.726902u^{24} + \cdots - 11.5476u - 17.8125 \\ 0.375000u^{25} + 0.531250u^{24} + \cdots - 6.71875u - 12.3125 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.122283u^{25} + 0.0366848u^{24} + \cdots + 2.39538u - 1.62500 \\ -0.187500u^{25} - 0.0625000u^{24} + \cdots + 3.59375u + 0.656250 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -0.157609u^{25} - 0.252717u^{24} + \cdots + 0.442935u + 8.18750 \\ -\frac{1}{8}u^{25} - \frac{3}{16}u^{24} + \cdots + \frac{3}{4}u + \frac{81}{16} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.377717u^{25} + 0.474185u^{24} + \cdots - 8.38587u - 11.0313 \\ 0.250000u^{25} + 0.375000u^{24} + \cdots - 4.96875u - 7.96875 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.347826u^{25} + 0.539402u^{24} + \cdots - 7.51630u - 11.5938 \\ 0.156250u^{25} + 0.343750u^{24} + \cdots - 3.59375u - 8 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.663043u^{25} + 0.951087u^{24} + \cdots - 13.5272u - 21.9375 \\ \frac{5}{16}u^{25} + \frac{5}{8}u^{24} + \cdots - \frac{125}{16}u - \frac{61}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{3}{2}u^{25} - \frac{3}{2}u^{24} + \cdots + \frac{147}{4}u + \frac{57}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^{26} + 16u^{25} + \cdots + 874u + 529$
c_2, c_5, c_7 c_{11}	$u^{26} - 2u^{25} + \cdots + 46u - 23$
c_3, c_{12}	$2(2u^{26} - 4u^{25} + \cdots + 5854u + 13513)$
c_4, c_6	$2(2u^{26} + 12u^{25} + \cdots - 2212u - 4061)$
c_8	$(u^{13} + 2u^{12} + \cdots - 3u + 1)^2$
c_9	$(u^{13} - 2u^{12} + \cdots + 9u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^{26} - 12y^{25} + \cdots - 3545358y + 279841$
c_2, c_5, c_7 c_{11}	$y^{26} - 16y^{25} + \cdots - 874y + 529$
c_3, c_{12}	$4(4y^{26} - 232y^{25} + \cdots + 2.78070 \times 10^8 y + 1.82601 \times 10^8)$
c_4, c_6	$4(4y^{26} + 88y^{25} + \cdots + 9.27579 \times 10^7 y + 1.64917 \times 10^7)$
c_8	$(y^{13} - 2y^{12} + \cdots + 17y - 1)^2$
c_9	$(y^{13} - 18y^{12} + \cdots + 65y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.145808 + 0.983156I$ $a = 1.47860 - 0.04032I$ $b = 0.285975 + 0.539303I$	$-10.07100 - 1.92961I$	$-9.33197 + 0.98070I$
$u = 0.145808 - 0.983156I$ $a = 1.47860 + 0.04032I$ $b = 0.285975 - 0.539303I$	$-10.07100 + 1.92961I$	$-9.33197 - 0.98070I$
$u = -0.694794 + 0.669489I$ $a = 0.747191 + 0.070295I$ $b = -0.044639 - 0.692695I$	3.24368	$1.97600 + 0.I$
$u = -0.694794 - 0.669489I$ $a = 0.747191 - 0.070295I$ $b = -0.044639 + 0.692695I$	3.24368	$1.97600 + 0.I$
$u = 0.727228 + 0.765886I$ $a = -0.656960 - 0.521646I$ $b = -0.485985 - 0.701709I$	0.0875120	$-10.12424 + 0.I$
$u = 0.727228 - 0.765886I$ $a = -0.656960 + 0.521646I$ $b = -0.485985 + 0.701709I$	0.0875120	$-10.12424 + 0.I$
$u = 0.089788 + 1.062330I$ $a = 1.239930 - 0.503480I$ $b = 0.331705 + 0.510914I$	$-8.73749 + 9.07090I$	$-7.83282 - 5.02365I$
$u = 0.089788 - 1.062330I$ $a = 1.239930 + 0.503480I$ $b = 0.331705 - 0.510914I$	$-8.73749 - 9.07090I$	$-7.83282 + 5.02365I$
$u = 1.071990 + 0.329976I$ $a = 1.056560 + 0.393863I$ $b = 1.60771 + 0.71133I$	$-4.67191 + 1.36942I$	$-12.56235 - 3.09698I$
$u = 1.071990 - 0.329976I$ $a = 1.056560 - 0.393863I$ $b = 1.60771 - 0.71133I$	$-4.67191 - 1.36942I$	$-12.56235 + 3.09698I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.14128$ $a = -0.980723$ $b = -1.64813$	-2.29729	-0.573860
$u = -1.166120 + 0.256035I$ $a = -0.63202 - 1.51574I$ $b = -0.93587 - 2.03026I$	$-4.67191 + 1.36942I$	$-12.56235 - 3.09698I$
$u = -1.166120 - 0.256035I$ $a = -0.63202 + 1.51574I$ $b = -0.93587 + 2.03026I$	$-4.67191 - 1.36942I$	$-12.56235 + 3.09698I$
$u = -1.148780 + 0.376438I$ $a = 0.276926 + 1.188600I$ $b = 0.77110 + 1.96980I$	$-1.36409 + 4.88678I$	$-5.58540 - 5.91732I$
$u = -1.148780 - 0.376438I$ $a = 0.276926 - 1.188600I$ $b = 0.77110 - 1.96980I$	$-1.36409 - 4.88678I$	$-5.58540 + 5.91732I$
$u = -0.722662$ $a = -2.98213$ $b = -1.92811$	-2.29729	-0.573860
$u = -0.048328 + 0.709054I$ $a = -1.16615 - 1.24694I$ $b = -0.0850094 - 0.1052430I$	$-1.36409 - 4.88678I$	$-5.58540 + 5.91732I$
$u = -0.048328 - 0.709054I$ $a = -1.16615 + 1.24694I$ $b = -0.0850094 + 0.1052430I$	$-1.36409 + 4.88678I$	$-5.58540 - 5.91732I$
$u = 1.277190 + 0.579499I$ $a = -0.27185 - 1.43511I$ $b = 0.07667 - 2.38894I$	$-13.50590 - 3.70097I$	$-11.32642 + 2.50956I$
$u = 1.277190 - 0.579499I$ $a = -0.27185 + 1.43511I$ $b = 0.07667 + 2.38894I$	$-13.50590 + 3.70097I$	$-11.32642 - 2.50956I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.31273 + 0.58386I$ $a = 0.040670 + 1.389900I$ $b = -0.44938 + 2.27345I$	$-8.73749 - 9.07090I$	$-7.83282 + 5.02365I$
$u = 1.31273 - 0.58386I$ $a = 0.040670 - 1.389900I$ $b = -0.44938 - 2.27345I$	$-8.73749 + 9.07090I$	$-7.83282 - 5.02365I$
$u = -1.38277 + 0.40950I$ $a = -0.082363 - 0.796616I$ $b = 0.62637 - 1.37358I$	$-10.07100 + 1.92961I$	$-9.33197 - 0.98070I$
$u = -1.38277 - 0.40950I$ $a = -0.082363 + 0.796616I$ $b = 0.62637 + 1.37358I$	$-10.07100 - 1.92961I$	$-9.33197 + 0.98070I$
$u = -1.39325 + 0.44582I$ $a = -0.049113 + 0.700779I$ $b = -0.91053 + 1.15456I$	$-13.50590 - 3.70097I$	$-11.32642 + 2.50956I$
$u = -1.39325 - 0.44582I$ $a = -0.049113 - 0.700779I$ $b = -0.91053 - 1.15456I$	$-13.50590 + 3.70097I$	$-11.32642 - 2.50956I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4u^2 - 8$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$(y^2+3y+4)^2$
c_2, c_5, c_7 c_{11}	$(y^2-y+2)^2$
c_3, c_4, c_6 c_{12}	$4(4y^4+16y^3+13y^2-6y+1)$
c_8, c_9	$(y-1)^4$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.978318 + 0.676097I$ $a = -0.239159 + 0.323389I$ $b = 0.452616 - 0.154683I$	$0.82247 - 5.33349I$	$-6.00000 + 5.29150I$
$u = 0.978318 - 0.676097I$ $a = -0.239159 - 0.323389I$ $b = 0.452616 + 0.154683I$	$0.82247 + 5.33349I$	$-6.00000 - 5.29150I$
$u = -0.978318 + 0.676097I$ $a = 0.739159 - 0.999486I$ $b = 0.04738 - 1.47756I$	$0.82247 + 5.33349I$	$-6.00000 - 5.29150I$
$u = -0.978318 - 0.676097I$ $a = 0.739159 + 0.999486I$ $b = 0.04738 + 1.47756I$	$0.82247 - 5.33349I$	$-6.00000 + 5.29150I$

IV. $\boldsymbol{I_4^u = \langle 4b^2 - 4b - 32u + 33,\ 2bu - 2b - u + 1,\ 2a + 1,\ u^2 - 2u + 1\rangle}$

(i) Arc colorings

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

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

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

$$a_9 = \begin{pmatrix} -0.5 \\ b \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{1}{4}u \\ -\frac{1}{2}b + \frac{3}{4}u + \frac{1}{4} \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} -2u + 2 \\ -4u + 3 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -\frac{1}{8}b + \frac{11}{8}u - \frac{3}{16} \\ -\frac{5}{8}b + \frac{33}{8}u - \frac{39}{16} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -b - 2u + 1 \\ -2u + \frac{3}{2} \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -\frac{7}{2}u + \frac{13}{4} \\ \frac{1}{2}b - \frac{5}{2}u + \frac{3}{2} \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_7 c_{10}	$(u-1)^3$
c_3	$512(2u+1)^3$
c_4	$512(2u-1)^3$
c_5, c_8, c_9 c_{11}	$(u+1)^3$
c_6	$64(2u-1)^3$
c_{12}	$64(2u+1)^3$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_5 c_7, c_8, c_9 c_{10}, c_{11}	$(y-1)^3$
c_3, c_4	$262144(4y-1)^3$
c_6, c_{12}	$4096(4y-1)^3$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -0.500000$ $b = 0.500000$	-3.28987	-12.0000
$u = 1.00000$ $a = -0.500000$ $b = 0.500000$	-3.28987	-12.0000
$u = 1.00000$ $a = -0.500000$ $b = 0.500000$	-3.28987	-12.0000

V. $I_5^u = \langle -u^3 + u^2 + 2b - u + 1,\ u^3 + u^2 + 2a - u + 1,\ u^4 + 1 \rangle$

(i) Arc colorings

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

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

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

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

$$a_7 = \begin{pmatrix} \frac{1}{2}u^3 - u^2 + \frac{1}{2}u \\ u^3 - \frac{1}{2}u^2 + u + \frac{1}{2} \end{pmatrix}$$

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

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

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

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

$$a_8 = \begin{pmatrix} -\frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{3}{2}u - \frac{1}{2} \\ \frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{3}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -\frac{3}{2}u^2 + \frac{1}{2} \\ \frac{1}{2}u^3 + \frac{1}{2}u + 1 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.707107 + 0.707107I$ $a = 0.207107 - 0.500000I$ $b = -0.500000 + 0.207107I$	1.64493	−4.00000
$u = 0.707107 - 0.707107I$ $a = 0.207107 + 0.500000I$ $b = -0.500000 - 0.207107I$	1.64493	−4.00000
$u = -0.707107 + 0.707107I$ $a = -1.207110 + 0.500000I$ $b = -0.500000 + 1.207110I$	1.64493	−4.00000
$u = -0.707107 - 0.707107I$ $a = -1.207110 - 0.500000I$ $b = -0.500000 - 1.207110I$	1.64493	−4.00000

VI. $\boldsymbol{I_6^u = \langle -a^2 + b - 2a,\ a^3 + 2a^2 + a + 1,\ u - 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a \\ a^2 + 2a \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a^2 \\ -a \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -a^2 \\ a \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -a^2 \\ -a^2 - a \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -a^2 \\ a \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -a^2 \\ a \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -a^2 \\ a \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_6^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -0.122561 + 0.744862I$ $b = -0.78492 + 1.30714I$	-1.64493	-6.00000
$u = 1.00000$ $a = -0.122561 - 0.744862I$ $b = -0.78492 - 1.30714I$	-1.64493	-6.00000
$u = 1.00000$ $a = -1.75488$ $b = -0.430160$	-1.64493	-6.00000

VII. $I^u_7 = \langle ba - a^2 + a + 1,\ u - 1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a \\ b \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a^2 \\ a^2 - a \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -b + 2a \\ a \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -a^3 + 1 \\ -a^3 + a^2 + 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -b + 2a \\ a \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -a^2 \\ -a^2 + a \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -a^2 - b + 2a \\ -a^2 + 2a \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_7^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$	-3.28987	-12.0000

VIII. $I^u_8 = \langle b - a - 1,\ u - 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_8^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \cdots$ $a = \cdots$ $b = \cdots$	-3.28987	-12.0000

IX. $I_1^v = \langle a,\ b^3 - b - 1,\ v - 1\rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ b \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ -b^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -b \\ b \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -b^2 + 1 \\ b^2 + b \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -b \\ b \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ -b^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -b + 1 \\ -b^2 + b \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -6$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 1.00000$ $a = 0$ $b = -0.662359 + 0.562280I$	-1.64493	-6.00000
$v = 1.00000$ $a = 0$ $b = -0.662359 - 0.562280I$	-1.64493	-6.00000
$v = 1.00000$ $a = 0$ $b = 1.32472$	-1.64493	-6.00000

X. $I_2^v = \langle a,\ b+1,\ v-1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 1.00000$ $a = 0$ $b = -1.00000$	0	0

XI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_{10}	$u^4(u-1)^3(u+1)^3(u^2+1)^2(u^2-u+2)^2(u^{15}+8u^{14}+\cdots+16u+4)$ $\cdot(u^{26}+16u^{25}+\cdots+874u+529)$
c_2, c_7	$u^4(u-1)^3(u+1)^3(u^4+1)(u^4-u^2+2)(u^{15}-2u^{14}+\cdots-4u^2+2)$ $\cdot(u^{26}-2u^{25}+\cdots+46u-23)$
c_3	$8192(u+1)(2u+1)^3(u^3-u-1)(u^3+2u^2+u+1)$ $\cdot(2u^4+2u^3+5u^2+4u+1)(2u^4+4u^3+6u^2+4u+1)$ $\cdot(2u^{15}-6u^{14}+\cdots-9u+3)(2u^{26}-4u^{25}+\cdots+5854u+13513)$
c_4	$8192(u+1)(2u-1)^3(u^3-u-1)(u^3-2u^2+u-1)$ $\cdot(2u^4-2u^3+5u^2-4u+1)(2u^4+4u^3+6u^2+4u+1)$ $\cdot(2u^{15}+2u^{14}+\cdots+27u+3)(2u^{26}+12u^{25}+\cdots-2212u-4061)$
c_5, c_{11}	$u^4(u+1)^6(u^4+1)(u^4-u^2+2)(u^{15}-2u^{14}+\cdots-4u^2+2)$ $\cdot(u^{26}-2u^{25}+\cdots+46u-23)$
c_6	$1024(u+1)(2u-1)^3(u^3-u-1)(u^3-2u^2+u-1)$ $\cdot(2u^4-2u^3+5u^2-4u+1)(2u^4+4u^3+6u^2+4u+1)$ $\cdot(2u^{15}+2u^{14}+\cdots+27u+3)(2u^{26}+12u^{25}+\cdots-2212u-4061)$
c_8	$3(u-1)^5(u+1)^7(u^3-u-1)^2(u^{13}+2u^{12}+\cdots-3u+1)^2$ $\cdot(3u^{15}-18u^{14}+\cdots+11u+7)$
c_9	$3(u-1)^5(u+1)^7(u^3-u-1)^2(u^{13}-2u^{12}+\cdots+9u+1)^2$ $\cdot(3u^{15}+18u^{14}+\cdots-17u+7)$
c_{12}	$1024(u+1)(2u+1)^3(u^3-u-1)(u^3+2u^2+u+1)$ $\cdot(2u^4+2u^3+5u^2+4u+1)(2u^4+4u^3+6u^2+4u+1)$ $\cdot(2u^{15}-6u^{14}+\cdots-9u+3)(2u^{26}-4u^{25}+\cdots+5854u+13513)$

XII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_{10}	$y^4(y-1)^6(y+1)^4(y^2+3y+4)^2(y^{15}+32y^{13}+\cdots+800y-16)$ $\cdot\,(y^{26}-12y^{25}+\cdots-3545358y+279841)$
c_2, c_5, c_7 c_{11}	$y^4(y-1)^6(y^2+1)^2(y^2-y+2)^2(y^{15}-8y^{14}+\cdots+16y-4)$ $\cdot\,(y^{26}-16y^{25}+\cdots-874y+529)$
c_3	$67108864(y-1)(4y-1)^3(y^3-2y^2-3y-1)(y^3-2y^2+y-1)$ $\cdot\,(4y^4+8y^3+8y^2-4y+1)(4y^4+16y^3+13y^2-6y+1)$ $\cdot\,(4y^{15}-104y^{14}+\cdots+249y-9)$ $\cdot\,(4y^{26}-232y^{25}+\cdots+278070166y+182601169)$
c_4	$67108864(y-1)(4y-1)^3(y^3-2y^2-3y-1)(y^3-2y^2+y-1)$ $\cdot\,(4y^4+8y^3+8y^2-4y+1)(4y^4+16y^3+13y^2-6y+1)$ $\cdot\,(4y^{15}+56y^{14}+\cdots+717y-9)$ $\cdot\,(4y^{26}+88y^{25}+\cdots+92757862y+16491721)$
c_6	$1048576(y-1)(4y-1)^3(y^3-2y^2-3y-1)(y^3-2y^2+y-1)$ $\cdot\,(4y^4+8y^3+8y^2-4y+1)(4y^4+16y^3+13y^2-6y+1)$ $\cdot\,(4y^{15}+56y^{14}+\cdots+717y-9)$ $\cdot\,(4y^{26}+88y^{25}+\cdots+92757862y+16491721)$
c_8	$9(y-1)^{12}(y^3-2y^2+y-1)^2(y^{13}-2y^{12}+\cdots+17y-1)^2$ $\cdot\,(9y^{15}-24y^{14}+\cdots+555y-49)$
c_9	$9(y-1)^{12}(y^3-2y^2+y-1)^2(y^{13}-18y^{12}+\cdots+65y-1)^2$ $\cdot\,(9y^{15}-168y^{14}+\cdots-229y-49)$
c_{12}	$1048576(y-1)(4y-1)^3(y^3-2y^2-3y-1)(y^3-2y^2+y-1)$ $\cdot\,(4y^4+8y^3+8y^2-4y+1)(4y^4+16y^3+13y^2-6y+1)$ $\cdot\,(4y^{15}-104y^{14}+\cdots+249y-9)$ $\cdot\,(4y^{26}-232y^{25}+\cdots+278070166y+182601169)$