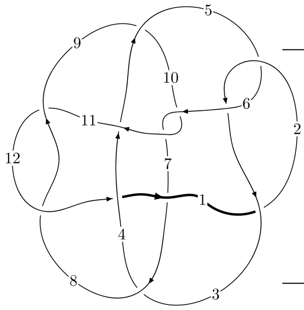
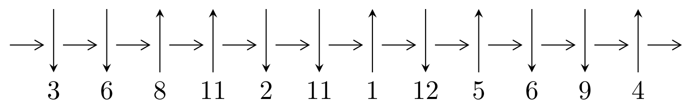
$12n_{0420}$ ($K12n_{0420}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$
\begin{aligned}
I_1^u = \langle & 364223527493u^{32} - 2361609064840u^{31} + \cdots + 1711903334071b + 90526252853, \\
& 671951659745u^{32} - 4453002864896u^{31} + \cdots + 342380668142a - 1160832184987, \\
& u^{33} - 8u^{32} + \cdots - 11u + 2\rangle \\
I_2^u = \langle & -u^{18} - 6u^{17} + \cdots + b + 3,\ 2u^{18} + 7u^{17} + \cdots + a + 2,\ u^{19} + 5u^{18} + \cdots - 2u - 1\rangle \\
I_3^u = \langle & u^{14}a + 39u^{14} + \cdots + a + 69,\ 12u^{14}a + 4u^{14} + \cdots + 19a + 12, \\
& u^{15} + 3u^{14} + 3u^{13} - 4u^{12} - 9u^{11} - 2u^{10} + 11u^9 + 5u^8 - 6u^7 - 2u^6 + 10u^5 + 3u^4 - 5u^3 + 3u + 1\rangle \\
I_4^u = \langle & b^2 - 3ba + a - 1,\ a^2 + 1,\ u - 1\rangle
\end{aligned}
$$

* 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. $I_1^u =$
$\langle 3.64\times10^{11}u^{32}-2.36\times10^{12}u^{31}+\cdots+1.71\times10^{11}b+9.05\times10^{10},\ 6.72\times10^{11}u^{32}-4.45\times10^{12}u^{31}+\cdots+3.42\times10^{11}a-1.16\times10^{12},\ u^{33}-8u^{32}+\cdots-11u+2\rangle$

(i) Arc colorings

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

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

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

$$a_{11} = \begin{pmatrix} -1.96259u^{32} + 13.0060u^{31} + \cdots - 22.5803u + 3.39047 \\ -2.12759u^{32} + 13.7952u^{31} + \cdots - 2.47506u - 0.528805 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1.18113u^{32} - 6.74280u^{31} + \cdots - 5.72215u + 4.99723 \\ 2.30591u^{32} - 15.5550u^{31} + \cdots + 7.17397u - 1.80465 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -0.716291u^{32} + 1.55456u^{31} + \cdots + 4.09153u + 1.50206 \\ -7.10380u^{32} + 48.6587u^{31} + \cdots - 37.9303u + 6.10199 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -1.12478u^{32} + 8.81217u^{31} + \cdots - 10.8961u + 6.80188 \\ -1.14806u^{32} + 10.3781u^{31} + \cdots - 22.6370u + 4.15836 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -1.96259u^{32} + 13.0060u^{31} + \cdots - 22.5803u + 3.39047 \\ 0.996508u^{32} - 9.67025u^{31} + \cdots + 23.2414u - 5.91819 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.264402u^{32} + 4.24281u^{31} + \cdots - 27.6237u + 5.38349 \\ 2.69469u^{32} - 18.4334u^{31} + \cdots + 18.1980u - 3.92517 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -1.35910u^{32} + 12.0492u^{31} + \cdots - 33.5143u + 3.10913 \\ 3.64636u^{32} - 25.3633u^{31} + \cdots + 26.2232u - 4.54568 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{71232541821}{171190334071}u^{32} + \frac{136288968420}{171190334071}u^{31} + \cdots + \frac{5957445668473}{171190334071}u - \frac{448061765060}{171190334071}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{33} + 8u^{32} + \cdots + 13u + 4$
c_2, c_5	$u^{33} + 8u^{32} + \cdots - 11u - 2$
c_3, c_{12}	$u^{33} - 9u^{31} + \cdots + 11u + 1$
c_4	$u^{33} - 16u^{31} + \cdots + 868u + 259$
c_6, c_{10}	$u^{33} + u^{32} + \cdots + 29u + 2$
c_7	$u^{33} - 29u^{32} + \cdots - 159744u + 16384$
c_8, c_{11}	$u^{33} - 11u^{32} + \cdots - 57u + 4$
c_9	$u^{33} + u^{32} + \cdots + 2u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{33} + 40y^{32} + \cdots - 2383y - 16$
c_2, c_5	$y^{33} - 8y^{32} + \cdots + 13y - 4$
c_3, c_{12}	$y^{33} - 18y^{32} + \cdots + 59y - 1$
c_4	$y^{33} - 32y^{32} + \cdots + 556584y - 67081$
c_6, c_{10}	$y^{33} + 53y^{32} + \cdots + 33y - 4$
c_7	$y^{33} - 9y^{32} + \cdots - 1459617792y - 268435456$
c_8, c_{11}	$y^{33} + 23y^{32} + \cdots + 177y - 16$
c_9	$y^{33} - 53y^{32} + \cdots - 8y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.703285 + 0.636850I$ $a = 1.106170 + 0.251999I$ $b = 0.909144 - 1.059290I$	$4.30952 + 3.14688I$	$2.88697 - 4.88211I$
$u = -0.703285 - 0.636850I$ $a = 1.106170 - 0.251999I$ $b = 0.909144 + 1.059290I$	$4.30952 - 3.14688I$	$2.88697 + 4.88211I$
$u = -0.417059 + 1.000070I$ $a = -0.648249 - 0.662444I$ $b = -0.580122 + 0.953178I$	$5.17920 - 2.64024I$	$3.71273 + 1.48167I$
$u = -0.417059 - 1.000070I$ $a = -0.648249 + 0.662444I$ $b = -0.580122 - 0.953178I$	$5.17920 + 2.64024I$	$3.71273 - 1.48167I$
$u = 1.030280 + 0.369979I$ $a = -0.005672 - 0.234478I$ $b = -0.462951 - 0.491884I$	$-1.92686 - 1.50296I$	$-0.206389 + 1.352839I$
$u = 1.030280 - 0.369979I$ $a = -0.005672 + 0.234478I$ $b = -0.462951 + 0.491884I$	$-1.92686 + 1.50296I$	$-0.206389 - 1.352839I$
$u = 1.100340 + 0.181053I$ $a = 0.180870 + 0.010838I$ $b = 0.858956 - 0.643211I$	$-0.342656 + 0.092474I$	$-4.88343 + 1.19512I$
$u = 1.100340 - 0.181053I$ $a = 0.180870 - 0.010838I$ $b = 0.858956 + 0.643211I$	$-0.342656 - 0.092474I$	$-4.88343 - 1.19512I$
$u = -0.759456 + 0.391806I$ $a = 0.009616 + 1.198430I$ $b = 0.866202 + 1.049840I$	$3.92702 + 0.90107I$	$3.65109 - 2.09842I$
$u = -0.759456 - 0.391806I$ $a = 0.009616 - 1.198430I$ $b = 0.866202 - 1.049840I$	$3.92702 - 0.90107I$	$3.65109 + 2.09842I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.075450+0.453106I$ $a=-0.361831+0.442964I$ $b=-0.063445+1.049590I$	$-1.12678+5.28243I$	$-1.72426-8.87772I$
$u=-1.075450-0.453106I$ $a=-0.361831-0.442964I$ $b=-0.063445-1.049590I$	$-1.12678-5.28243I$	$-1.72426+8.87772I$
$u=\ \ 0.617486+0.446217I$ $a=\ \ 0.750133+0.203711I$ $b=\ \ 0.207012-0.540399I$	$-0.66765-1.55785I$	$-3.86335+5.45533I$
$u=\ \ 0.617486-0.446217I$ $a=\ \ 0.750133-0.203711I$ $b=\ \ 0.207012+0.540399I$	$-0.66765+1.55785I$	$-3.86335-5.45533I$
$u=-0.268250+0.672707I$ $a=\ \ 0.777671+0.095093I$ $b=\ \ 0.068519-0.534112I$	$1.35635-1.05663I$	$4.19428+2.46182I$
$u=-0.268250-0.672707I$ $a=\ \ 0.777671-0.095093I$ $b=\ \ 0.068519+0.534112I$	$1.35635+1.05663I$	$4.19428-2.46182I$
$u=\ \ 0.868458+0.964205I$ $a=-1.45868-0.78756I$ $b=-0.48302-1.49770I$	$12.95180-2.19664I$	$5.82474+2.27919I$
$u=\ \ 0.868458-0.964205I$ $a=-1.45868+0.78756I$ $b=-0.48302+1.49770I$	$12.95180+2.19664I$	$5.82474-2.27919I$
$u=\ \ 0.916626+0.950177I$ $a=-1.06864-1.17969I$ $b=-0.08093-1.74309I$	$9.06275+2.60903I$	$0.48775-2.35974I$
$u=\ \ 0.916626-0.950177I$ $a=-1.06864+1.17969I$ $b=-0.08093+1.74309I$	$9.06275-2.60903I$	$0.48775+2.35974I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.023220 + 0.876693I$ $a = 0.87894 + 1.19241I$ $b = 0.37002 + 2.13539I$	$12.43740 - 4.58287I$	$4.99508 + 2.38247I$
$u = 1.023220 - 0.876693I$ $a = 0.87894 - 1.19241I$ $b = 0.37002 - 2.13539I$	$12.43740 + 4.58287I$	$4.99508 - 2.38247I$
$u = 0.990802 + 0.915834I$ $a = 1.36449 + 0.89241I$ $b = 0.89932 + 1.99675I$	$8.82668 - 9.47341I$	$0. + 6.83895I$
$u = 0.990802 - 0.915834I$ $a = 1.36449 - 0.89241I$ $b = 0.89932 - 1.99675I$	$8.82668 + 9.47341I$	$0. - 6.83895I$
$u = -1.241080 + 0.559280I$ $a = -0.055515 - 0.655838I$ $b = -1.07954 - 1.10250I$	$2.34090 + 8.49049I$	$2.07804 - 5.32543I$
$u = -1.241080 - 0.559280I$ $a = -0.055515 + 0.655838I$ $b = -1.07954 + 1.10250I$	$2.34090 - 8.49049I$	$2.07804 + 5.32543I$
$u = 0.893546 + 1.073000I$ $a = 1.11701 + 1.10394I$ $b = -0.47751 + 1.72433I$	$14.6502 + 8.3217I$	$2.61160 - 3.46041I$
$u = 0.893546 - 1.073000I$ $a = 1.11701 - 1.10394I$ $b = -0.47751 - 1.72433I$	$14.6502 - 8.3217I$	$2.61160 + 3.46041I$
$u = 1.08079 + 0.94085I$ $a = -1.30612 - 0.84939I$ $b = -0.96271 - 2.44484I$	$14.0051 - 15.6492I$	$1.72340 + 7.56042I$
$u = 1.08079 - 0.94085I$ $a = -1.30612 + 0.84939I$ $b = -0.96271 + 2.44484I$	$14.0051 + 15.6492I$	$1.72340 - 7.56042I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.530622$ $a = -2.30551$ $b = -1.44839$	-2.29787	-17.6560
$u = 0.208352 + 0.257728I$ $a = -2.37744 - 2.48596I$ $b = -0.264747 + 1.039230I$	$3.34739 - 0.13046I$	$5.79773 + 0.03563I$
$u = 0.208352 - 0.257728I$ $a = -2.37744 + 2.48596I$ $b = -0.264747 - 1.039230I$	$3.34739 + 0.13046I$	$5.79773 - 0.03563I$

II.
$\boldsymbol{I_2^u = \langle -u^{18} - 6u^{17} + \cdots + b + 3,\ 2u^{18} + 7u^{17} + \cdots + a + 2,\ u^{19} + 5u^{18} + \cdots - 2u - 1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -2u^{18} - 7u^{17} + \cdots + u - 2 \\ u^{18} + 6u^{17} + \cdots - 4u - 3 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -2u^{17} - 8u^{16} + \cdots - 4u + 1 \\ -u^{17} - 4u^{16} + \cdots - 4u^3 - 6u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^{18} - 4u^{17} + \cdots - 4u - 1 \\ -3u^{18} - 12u^{17} + \cdots + 3u + 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^{17} - 4u^{16} + \cdots - 2u + 1 \\ -4u^{18} - 17u^{17} + \cdots + 5u + 4 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -2u^{18} - 7u^{17} + \cdots + u - 2 \\ 4u^{18} + 19u^{17} + \cdots - 8u - 6 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -3u^{18} - 14u^{17} + \cdots + 3u + 2 \\ 3u^{18} + 12u^{17} + \cdots - 6u - 2 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -3u^{18} - 12u^{17} + \cdots + 5u + 3 \\ 2u^{18} + 11u^{17} + \cdots - 3u - 5 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -14u^{18} - 57u^{17} - 68u^{16} + 85u^{15} + 290u^{14} + 126u^{13} - 418u^{12} - 544u^{11} + 95u^{10} + 567u^9 + 182u^8 - 289u^7 - 164u^6 + 78u^5 + u^4 - 101u^3 - 31u^2 + 35u + 22$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{19} - 7u^{18} + \cdots + 8u - 1$
c_2	$u^{19} + 5u^{18} + \cdots - 2u - 1$
c_3, c_{12}	$u^{19} + 2u^{16} + \cdots + 3u + 1$
c_4	$u^{19} - 7u^{17} + \cdots + 2u - 1$
c_5	$u^{19} - 5u^{18} + \cdots - 2u + 1$
c_6	$u^{19} + u^{18} + \cdots - u - 1$
c_7	$u^{19} - 8u^{18} + \cdots + 2u - 1$
c_8	$u^{19} - 8u^{18} + \cdots + 103u - 13$
c_9	$u^{19} - u^{18} + \cdots + 2u + 1$
c_{10}	$u^{19} - u^{18} + \cdots - u + 1$
c_{11}	$u^{19} + 8u^{18} + \cdots + 103u + 13$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{19} + 17y^{18} + \cdots + 4y - 1$
c_2, c_5	$y^{19} - 7y^{18} + \cdots + 8y - 1$
c_3, c_{12}	$y^{19} + 10y^{17} + \cdots + 3y - 1$
c_4	$y^{19} - 14y^{18} + \cdots - 4y - 1$
c_6, c_{10}	$y^{19} + 7y^{18} + \cdots + 15y - 1$
c_7	$y^{19} - 8y^{18} + \cdots - 6y - 1$
c_8, c_{11}	$y^{19} + 12y^{18} + \cdots - 25y - 169$
c_9	$y^{19} - 11y^{18} + \cdots + 12y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.932201 + 0.382585I$ $a = -0.652447 + 0.235364I$ $b = -0.990085 - 0.241494I$	$-2.78530 - 1.52808I$	$-10.73635 + 2.82089I$
$u = 0.932201 - 0.382585I$ $a = -0.652447 - 0.235364I$ $b = -0.990085 + 0.241494I$	$-2.78530 + 1.52808I$	$-10.73635 - 2.82089I$
$u = -0.624787 + 0.658264I$ $a = 1.003060 + 0.151577I$ $b = 0.255285 + 0.371052I$	$-0.002497 + 0.784497I$	$2.96024 + 1.59105I$
$u = -0.624787 - 0.658264I$ $a = 1.003060 - 0.151577I$ $b = 0.255285 - 0.371052I$	$-0.002497 - 0.784497I$	$2.96024 - 1.59105I$
$u = -1.021020 + 0.575808I$ $a = 0.239601 + 0.502383I$ $b = 0.144505 + 1.025180I$	$-1.25834 + 4.04878I$	$-0.84230 - 4.09364I$
$u = -1.021020 - 0.575808I$ $a = 0.239601 - 0.502383I$ $b = 0.144505 - 1.025180I$	$-1.25834 - 4.04878I$	$-0.84230 + 4.09364I$
$u = -1.067510 + 0.498451I$ $a = -0.488686 - 0.116550I$ $b = -0.948978 - 0.694197I$	$0.84328 + 8.76402I$	$-3.62315 - 7.96043I$
$u = -1.067510 - 0.498451I$ $a = -0.488686 + 0.116550I$ $b = -0.948978 + 0.694197I$	$0.84328 - 8.76402I$	$-3.62315 + 7.96043I$
$u = 1.169200 + 0.389254I$ $a = 0.304496 - 0.673763I$ $b = 1.20589 - 0.89024I$	$0.243599 + 1.379440I$	$-1.72015 - 3.05492I$
$u = 1.169200 - 0.389254I$ $a = 0.304496 + 0.673763I$ $b = 1.20589 + 0.89024I$	$0.243599 - 1.379440I$	$-1.72015 + 3.05492I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.371084 + 0.611861I$ $a = 1.24272 - 1.18831I$ $b = 1.054910 + 0.717314I$	$3.06976 - 5.52425I$	$0.98196 + 6.56688I$
$u = 0.371084 - 0.611861I$ $a = 1.24272 + 1.18831I$ $b = 1.054910 - 0.717314I$	$3.06976 + 5.52425I$	$0.98196 - 6.56688I$
$u = -0.555549 + 0.399589I$ $a = -1.021540 - 0.577214I$ $b = 0.486749 - 0.634203I$	$2.60739 - 4.81529I$	$1.74304 + 2.99283I$
$u = -0.555549 - 0.399589I$ $a = -1.021540 + 0.577214I$ $b = 0.486749 + 0.634203I$	$2.60739 + 4.81529I$	$1.74304 - 2.99283I$
$u = -0.876351 + 1.033240I$ $a = -1.20703 + 0.83058I$ $b = 0.00403 + 1.52107I$	$10.98580 + 1.99614I$	$1.00063 - 2.24339I$
$u = -0.876351 - 1.033240I$ $a = -1.20703 - 0.83058I$ $b = 0.00403 - 1.52107I$	$10.98580 - 1.99614I$	$1.00063 + 2.24339I$
$u = -1.063610 + 0.923538I$ $a = 1.021470 - 0.912245I$ $b = 0.57254 - 2.13980I$	$10.36830 + 5.14621I$	$0.49469 - 2.50743I$
$u = -1.063610 - 0.923538I$ $a = 1.021470 + 0.912245I$ $b = 0.57254 + 2.13980I$	$10.36830 - 5.14621I$	$0.49469 + 2.50743I$
$u = 0.472695$ $a = -2.88328$ $b = -1.56969$	-2.08591	20.4830

III. $\boldsymbol{I_3^u =}$
$\boldsymbol{\langle u^{14}a+39u^{14}+\cdots+a+69,\ 12u^{14}a+4u^{14}+\cdots+19a+12,\ u^{15}+3u^{14}+\cdots+3u+1\rangle}$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} a \\ -\frac{1}{4}u^{14}a - \frac{39}{4}u^{14} + \cdots - \frac{1}{4}a - \frac{69}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -7u^{14}a - u^{14} + \cdots - 12a - 4 \\ \frac{3}{4}u^{14}a + \frac{1}{4}u^{14} + \cdots + \frac{5}{4}a + \frac{5}{4} \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -7u^{14}a - u^{14} + \cdots - 12a - 3 \\ \frac{3}{4}u^{14}a + \frac{1}{4}u^{14} + \cdots + \frac{5}{4}a + \frac{5}{4} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -7.75000au^{14} - 1.25000u^{14} + \cdots - 13.2500a - 5.25000 \\ -\frac{5}{2}u^{14}a - 7u^{13}a + \cdots - \frac{11}{2}a - 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a \\ -\frac{1}{4}u^{14}a - \frac{39}{4}u^{14} + \cdots - \frac{1}{4}a - \frac{69}{4} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{4}u^{14}a + \frac{11}{4}u^{14} + \cdots + \frac{5}{4}a + \frac{21}{4} \\ -7u^{14} - 17u^{13} + \cdots - 17u - 12 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -\frac{11}{4}u^{14}a - \frac{3}{4}u^{14} + \cdots - \frac{9}{4}a - \frac{11}{4} \\ \frac{1}{4}u^{14}a - \frac{11}{4}u^{14} + \cdots + \frac{1}{4}a - \frac{9}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -17u^{14} - 44u^{13} - 31u^{12} + 85u^{11} + 122u^{10} - 24u^9 - 191u^8 - 12u^7 + 126u^6 - 8u^5 - 174u^4 + 11u^3 + 96u^2 - 32u - 45$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{15}+3u^{14}+\cdots+9u+1)^2$
c_2, c_5	$(u^{15}-3u^{14}+\cdots+3u-1)^2$
c_3, c_{12}	$u^{30}+3u^{29}+\cdots+8u+2$
c_4	$u^{30}-u^{29}+\cdots+72516u+14102$
c_6, c_{10}	$u^{30}-3u^{29}+\cdots+8468u+872$
c_7	$(u+1)^{30}$
c_8, c_{11}	$(u^{15}+3u^{14}+\cdots+u+3)^2$
c_9	$u^{30}-u^{29}+\cdots+47532u+25406$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{15}+21y^{14}+\cdots+9y-1)^2$
c_2, c_5	$(y^{15}-3y^{14}+\cdots+9y-1)^2$
c_3, c_{12}	$y^{30}-3y^{29}+\cdots+316y^2+4$
c_4	$y^{30}-27y^{29}+\cdots-960449880y+198866404$
c_6, c_{10}	$y^{30}+39y^{29}+\cdots-9306704y+760384$
c_7	$(y-1)^{30}$
c_8, c_{11}	$(y^{15}+13y^{14}+\cdots+49y-9)^2$
c_9	$y^{30}-39y^{29}+\cdots+4154402864y+645464836$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.455780 + 0.742288I$ $a = 0.374894 - 0.055630I$ $b = 0.80444 + 1.32107I$	$4.49075 - 5.71085I$	$6.46241 + 7.10367I$
$u = 0.455780 + 0.742288I$ $a = -2.14568 + 1.13593I$ $b = -0.614258 - 0.952191I$	$4.49075 - 5.71085I$	$6.46241 + 7.10367I$
$u = 0.455780 - 0.742288I$ $a = 0.374894 + 0.055630I$ $b = 0.80444 - 1.32107I$	$4.49075 + 5.71085I$	$6.46241 - 7.10367I$
$u = 0.455780 - 0.742288I$ $a = -2.14568 - 1.13593I$ $b = -0.614258 + 0.952191I$	$4.49075 + 5.71085I$	$6.46241 - 7.10367I$
$u = 1.138960 + 0.300791I$ $a = -0.103181 - 0.773806I$ $b = 0.554576 - 0.429686I$	$1.96309 + 1.51473I$	$3.34538 - 3.96091I$
$u = 1.138960 + 0.300791I$ $a = -0.365344 + 1.172340I$ $b = -1.36268 + 2.77623I$	$1.96309 + 1.51473I$	$3.34538 - 3.96091I$
$u = 1.138960 - 0.300791I$ $a = -0.103181 + 0.773806I$ $b = 0.554576 + 0.429686I$	$1.96309 - 1.51473I$	$3.34538 + 3.96091I$
$u = 1.138960 - 0.300791I$ $a = -0.365344 - 1.172340I$ $b = -1.36268 - 2.77623I$	$1.96309 - 1.51473I$	$3.34538 + 3.96091I$
$u = 0.679943 + 0.425075I$ $a = 1.288550 + 0.270756I$ $b = 0.310334 - 0.078658I$	$-0.68938 - 1.70420I$	$-3.28110 + 6.20426I$
$u = 0.679943 + 0.425075I$ $a = 0.176983 - 0.279271I$ $b = -0.096624 - 1.275770I$	$-0.68938 - 1.70420I$	$-3.28110 + 6.20426I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.679943 - 0.425075I$ $a = 1.288550 - 0.270756I$ $b = 0.310334 + 0.078658I$	$-0.68938 + 1.70420I$	$-3.28110 - 6.20426I$
$u = 0.679943 - 0.425075I$ $a = 0.176983 + 0.279271I$ $b = -0.096624 + 1.275770I$	$-0.68938 + 1.70420I$	$-3.28110 - 6.20426I$
$u = -0.966502 + 0.945831I$ $a = 1.230920 - 0.689205I$ $b = 0.90511 - 1.88788I$	$8.07776 + 3.48053I$	$-1.20552 - 1.99086I$
$u = -0.966502 + 0.945831I$ $a = -0.95957 + 1.09544I$ $b = 0.08832 + 1.59239I$	$8.07776 + 3.48053I$	$-1.20552 - 1.99086I$
$u = -0.966502 - 0.945831I$ $a = 1.230920 + 0.689205I$ $b = 0.90511 + 1.88788I$	$8.07776 - 3.48053I$	$-1.20552 + 1.99086I$
$u = -0.966502 - 0.945831I$ $a = -0.95957 - 1.09544I$ $b = 0.08832 - 1.59239I$	$8.07776 - 3.48053I$	$-1.20552 + 1.99086I$
$u = -0.572435 + 0.216966I$ $a = 1.54766 - 0.25368I$ $b = 2.07813 + 0.63415I$	$1.75184 + 5.76927I$	$-5.27590 - 9.59925I$
$u = -0.572435 + 0.216966I$ $a = 1.59367 + 1.91830I$ $b = 0.541087 - 0.592067I$	$1.75184 + 5.76927I$	$-5.27590 - 9.59925I$
$u = -0.572435 - 0.216966I$ $a = 1.54766 + 0.25368I$ $b = 2.07813 - 0.63415I$	$1.75184 - 5.76927I$	$-5.27590 + 9.59925I$
$u = -0.572435 - 0.216966I$ $a = 1.59367 - 1.91830I$ $b = 0.541087 + 0.592067I$	$1.75184 - 5.76927I$	$-5.27590 + 9.59925I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.862360+1.093580I$ $a=-1.045040+0.596115I$ $b=-0.319838+1.263430I$	$12.51580+1.19189I$	$6.81331+0.30242I$
$u=-0.862360+1.093580I$ $a=\quad 1.27746-1.33704I$ $b=-1.21684-1.86631I$	$12.51580+1.19189I$	$6.81331+0.30242I$
$u=-0.862360-1.093580I$ $a=-1.045040-0.596115I$ $b=-0.319838-1.263430I$	$12.51580-1.19189I$	$6.81331-0.30242I$
$u=-0.862360-1.093580I$ $a=\quad 1.27746+1.33704I$ $b=-1.21684+1.86631I$	$12.51580-1.19189I$	$6.81331-0.30242I$
$u=-1.11139+0.94100I$ $a=\quad 0.803051-0.849353I$ $b=\quad 0.41663-1.67373I$	$11.69180+6.19707I$	$5.35055-5.75816I$
$u=-1.11139+0.94100I$ $a=-1.44943+0.77049I$ $b=-1.21250+3.06428I$	$11.69180+6.19707I$	$5.35055-5.75816I$
$u=-1.11139-0.94100I$ $a=\quad 0.803051+0.849353I$ $b=\quad 0.41663+1.67373I$	$11.69180-6.19707I$	$5.35055+5.75816I$
$u=-1.11139-0.94100I$ $a=-1.44943-0.77049I$ $b=-1.21250-3.06428I$	$11.69180-6.19707I$	$5.35055+5.75816I$
$u=-0.523988$ $a=-2.22494+0.27610I$ $b=-1.375880-0.228118I$	-2.29134	-14.4180
$u=-0.523988$ $a=-2.22494-0.27610I$ $b=-1.375880+0.228118I$	-2.29134	-14.4180

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

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} a \\ b \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ -ba + 1 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 1 \\ -ba \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} ba + 2 \\ 2ba - a + 2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a \\ b - a \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -b + 3a \\ a \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} ba + a + 3 \\ b + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 1.000000I$ $b = 0.418797 + 0.306103I$	1.64493	0
$u = 1.00000$ $a = 1.000000I$ $b = -0.41880 + 2.69390I$	1.64493	0
$u = 1.00000$ $a = -1.000000I$ $b = 0.418797 - 0.306103I$	1.64493	0
$u = 1.00000$ $a = -1.000000I$ $b = -0.41880 - 2.69390I$	1.64493	0

V. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u-1)^4)(u^{15}+3u^{14}+\cdots+9u+1)^2(u^{19}-7u^{18}+\cdots+8u-1)$ $\cdot(u^{33}+8u^{32}+\cdots+13u+4)$
c_2	$((u-1)^4)(u^{15}-3u^{14}+\cdots+3u-1)^2(u^{19}+5u^{18}+\cdots-2u-1)$ $\cdot(u^{33}+8u^{32}+\cdots-11u-2)$
c_3, c_{12}	$(u^4-2u^3-u^2+2u+2)(u^{19}+2u^{16}+\cdots+3u+1)$ $\cdot(u^{30}+3u^{29}+\cdots+8u+2)(u^{33}-9u^{31}+\cdots+11u+1)$
c_4	$(u^4+3u^2-2u+2)(u^{19}-7u^{17}+\cdots+2u-1)$ $\cdot(u^{30}-u^{29}+\cdots+72516u+14102)(u^{33}-16u^{31}+\cdots+868u+259)$
c_5	$((u+1)^4)(u^{15}-3u^{14}+\cdots+3u-1)^2(u^{19}-5u^{18}+\cdots-2u+1)$ $\cdot(u^{33}+8u^{32}+\cdots-11u-2)$
c_6	$((u^2+1)^2)(u^{19}+u^{18}+\cdots-u-1)(u^{30}-3u^{29}+\cdots+8468u+872)$ $\cdot(u^{33}+u^{32}+\cdots+29u+2)$
c_7	$((u+1)^{34})(u^{19}-8u^{18}+\cdots+2u-1)$ $\cdot(u^{33}-29u^{32}+\cdots-159744u+16384)$
c_8	$((u^2+1)^2)(u^{15}+3u^{14}+\cdots+u+3)^2(u^{19}-8u^{18}+\cdots+103u-13)$ $\cdot(u^{33}-11u^{32}+\cdots-57u+4)$
c_9	$(u^4+3u^2-2u+2)(u^{19}-u^{18}+\cdots+2u+1)$ $\cdot(u^{30}-u^{29}+\cdots+47532u+25406)(u^{33}+u^{32}+\cdots+2u+1)$
c_{10}	$((u^2+1)^2)(u^{19}-u^{18}+\cdots-u+1)(u^{30}-3u^{29}+\cdots+8468u+872)$ $\cdot(u^{33}+u^{32}+\cdots+29u+2)$
c_{11}	$((u^2+1)^2)(u^{15}+3u^{14}+\cdots+u+3)^2(u^{19}+8u^{18}+\cdots+103u+13)$ $\cdot(u^{33}-11u^{32}+\cdots-57u+4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^4)(y^{15}+21y^{14}+\cdots+9y-1)^2(y^{19}+17y^{18}+\cdots+4y-1)$ $\cdot(y^{33}+40y^{32}+\cdots-2383y-16)$
c_2, c_5	$((y-1)^4)(y^{15}-3y^{14}+\cdots+9y-1)^2(y^{19}-7y^{18}+\cdots+8y-1)$ $\cdot(y^{33}-8y^{32}+\cdots+13y-4)$
c_3, c_{12}	$(y^4-6y^3+13y^2-8y+4)(y^{19}+10y^{17}+\cdots+3y-1)$ $\cdot(y^{30}-3y^{29}+\cdots+316y^2+4)(y^{33}-18y^{32}+\cdots+59y-1)$
c_4	$(y^4+6y^3+13y^2+8y+4)(y^{19}-14y^{18}+\cdots-4y-1)$ $\cdot(y^{30}-27y^{29}+\cdots-960449880y+198866404)$ $\cdot(y^{33}-32y^{32}+\cdots+556584y-67081)$
c_6, c_{10}	$((y+1)^4)(y^{19}+7y^{18}+\cdots+15y-1)$ $\cdot(y^{30}+39y^{29}+\cdots-9306704y+760384)$ $\cdot(y^{33}+53y^{32}+\cdots+33y-4)$
c_7	$((y-1)^{34})(y^{19}-8y^{18}+\cdots-6y-1)$ $\cdot(y^{33}-9y^{32}+\cdots-1459617792y-268435456)$
c_8, c_{11}	$((y+1)^4)(y^{15}+13y^{14}+\cdots+49y-9)^2$ $\cdot(y^{19}+12y^{18}+\cdots-25y-169)(y^{33}+23y^{32}+\cdots+177y-16)$
c_9	$(y^4+6y^3+13y^2+8y+4)(y^{19}-11y^{18}+\cdots+12y-1)$ $\cdot(y^{30}-39y^{29}+\cdots+4154402864y+645464836)$ $\cdot(y^{33}-53y^{32}+\cdots-8y-1)$