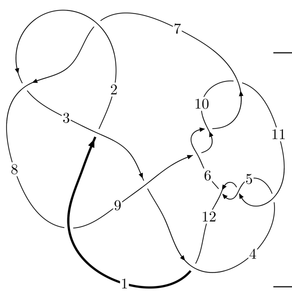
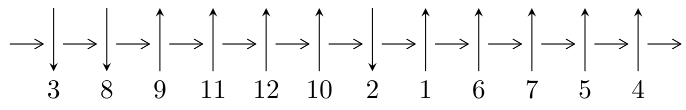
$12a_{0737}$ ($K12a_{0737}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^{34} - u^{33} + \cdots + 8b - 7u,\ -u^{34} + u^{33} + \cdots + 8a + 23u,\ u^{35} - u^{34} + \cdots + 5u^2 - 1\rangle$$

$$\begin{aligned} I_2^u = \langle &3u^{13} - u^{12} - 22u^{11} + 11u^{10} + 49u^9 - 17u^8 - 35u^7 - 15u^6 - 4u^5 + 45u^4 + 8u^3 - 16u^2 + 11b - 2u - 9,\\ &5u^{13} + 2u^{12} - 22u^{11} - 11u^{10} + 34u^9 + 23u^8 - 7u^7 - 25u^6 - 36u^5 + 20u^4 + 39u^3 - u^2 + 11a - 7u - 15,\\ &u^{14} - 5u^{12} + 9u^{10} + u^9 - 5u^8 - 4u^7 - 3u^6 + 6u^5 + 4u^4 - 2u^3 - 2u - 1\rangle \end{aligned}$$

$$\begin{aligned} I_3^u = \langle &48312506401u^{39} - 25481530594u^{38} + \cdots + 431986969939b - 277160237401,\\ &-199007192694u^{39} + 322170993904u^{38} + \cdots + 215993484695a + 1742428011421,\\ &u^{40} - u^{39} + \cdots + 6u + 5\rangle \end{aligned}$$

$$I_4^u = \langle b + a - 1,\ a^4 + 2a^2 + 2,\ u + 1\rangle$$

$$I_5^u = \langle b + a + 1,\ a^3,\ u - 1\rangle$$

* 5 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 96 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. $\boldsymbol{I_1^u =}$
$\boldsymbol{\langle u^{34} - u^{33} + \cdots + 8b - 7u,\ -u^{34} + u^{33} + \cdots + 8a + 23u,\ u^{35} - u^{34} + \cdots + 5u^2 - 1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{1}{8}u^{34} - \frac{1}{8}u^{33} + \cdots - \frac{5}{2}u^3 - \frac{23}{8}u \\ -\frac{1}{8}u^{34} + \frac{1}{8}u^{33} + \cdots + \frac{7}{2}u^3 + \frac{7}{8}u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{8}u^{34} - \frac{1}{8}u^{33} + \cdots - \frac{5}{2}u^3 - \frac{15}{8}u \\ -\frac{1}{8}u^{34} + \frac{1}{8}u^{33} + \cdots + \frac{5}{2}u^3 + \frac{7}{8}u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{1}{8}u^{33} + \frac{1}{8}u^{32} + \cdots + \frac{5}{2}u^2 + \frac{7}{8} \\ \frac{1}{8}u^{33} - \frac{1}{8}u^{32} + \cdots - \frac{5}{2}u^2 + \frac{1}{8} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^5 - 2u^3 + u \\ -u^5 + u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{8}u^{34} - \frac{1}{4}u^{33} + \cdots - \frac{1}{8}u + \frac{7}{8} \\ \frac{1}{8}u^{34} + \frac{3}{8}u^{33} + \cdots + \frac{1}{8}u + \frac{1}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{1}{8}u^{34} - \frac{1}{8}u^{33} + \cdots - \frac{13}{2}u^3 - \frac{23}{8}u \\ u^{13} - 5u^{11} + 7u^9 + 2u^7 - 8u^5 - u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{8}u^{34} - u^{33} + \cdots + \frac{13}{8}u - \frac{7}{8} \\ \frac{1}{4}u^{34} + \frac{7}{8}u^{33} + \cdots - \frac{13}{4}u^2 + \frac{7}{8} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{3}{4}u^{34} + \frac{1}{4}u^{33} + \cdots + \frac{49}{4}u + \frac{15}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{35} + 17u^{34} + \cdots + 4u + 4$
c_2, c_7	$u^{35} + 3u^{34} + \cdots + 6u + 2$
c_3	$u^{35} - 3u^{34} + \cdots + 72u + 296$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$u^{35} - u^{34} + \cdots + 5u^2 - 1$
c_8	$u^{35} + 9u^{34} + \cdots - 70u - 46$
c_{12}	$u^{35} + 3u^{34} + \cdots + 256u + 256$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{35} + 3y^{34} + \cdots - 240y - 16$
c_2, c_7	$y^{35} - 17y^{34} + \cdots + 4y - 4$
c_3	$y^{35} - y^{34} + \cdots + 704928y - 87616$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$y^{35} - 37y^{34} + \cdots + 10y - 1$
c_8	$y^{35} + 11y^{34} + \cdots + 28820y - 2116$
c_{12}	$y^{35} + 7y^{34} + \cdots + 1441792y - 65536$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.167828 + 0.756763I$ $a = 0.22251 - 1.74569I$ $b = 0.396759 - 0.137285I$	$-4.21898 - 7.81840I$	$0.96471 + 7.49925I$
$u = -0.167828 - 0.756763I$ $a = 0.22251 + 1.74569I$ $b = 0.396759 + 0.137285I$	$-4.21898 + 7.81840I$	$0.96471 - 7.49925I$
$u = -0.086793 + 0.752466I$ $a = 0.11704 - 1.72052I$ $b = 0.203323 - 0.193454I$	$-5.93777 - 0.09592I$	$-2.21151 + 0.44008I$
$u = -0.086793 - 0.752466I$ $a = 0.11704 + 1.72052I$ $b = 0.203323 + 0.193454I$	$-5.93777 + 0.09592I$	$-2.21151 - 0.44008I$
$u = 0.152216 + 0.717373I$ $a = -0.21415 - 1.68842I$ $b = -0.321763 - 0.065640I$	$-1.80618 + 3.02164I$	$3.90973 - 3.95401I$
$u = 0.152216 - 0.717373I$ $a = -0.21415 + 1.68842I$ $b = -0.321763 + 0.065640I$	$-1.80618 - 3.02164I$	$3.90973 + 3.95401I$
$u = -1.300490 + 0.187880I$ $a = -1.52389 - 1.71909I$ $b = 2.06311 + 2.28997I$	$2.41004 + 1.41249I$	$9.47570 + 0.I$
$u = -1.300490 - 0.187880I$ $a = -1.52389 + 1.71909I$ $b = 2.06311 - 2.28997I$	$2.41004 - 1.41249I$	$9.47570 + 0.I$
$u = -1.311970 + 0.248425I$ $a = -1.07722 - 1.85643I$ $b = 1.68583 + 2.62705I$	$1.60231 - 6.99533I$	$7.54634 + 6.51965I$
$u = -1.311970 - 0.248425I$ $a = -1.07722 + 1.85643I$ $b = 1.68583 - 2.62705I$	$1.60231 + 6.99533I$	$7.54634 - 6.51965I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.331990 + 0.208218I$ $a = 1.25521 - 1.60201I$ $b = -1.72921 + 2.28481I$	$5.46888 + 3.18024I$	$12.51891 - 3.03421I$
$u = 1.331990 - 0.208218I$ $a = 1.25521 + 1.60201I$ $b = -1.72921 - 2.28481I$	$5.46888 - 3.18024I$	$12.51891 + 3.03421I$
$u = 0.161198 + 0.551221I$ $a = -0.29100 - 1.43200I$ $b = -0.174142 + 0.205041I$	$-0.34475 + 1.77362I$	$4.56578 - 5.89788I$
$u = 0.161198 - 0.551221I$ $a = -0.29100 + 1.43200I$ $b = -0.174142 - 0.205041I$	$-0.34475 - 1.77362I$	$4.56578 + 5.89788I$
$u = 1.38810 + 0.33957I$ $a = 0.48176 - 1.67486I$ $b = -1.06352 + 2.91942I$	$3.48171 + 8.10374I$	$6.00000 - 4.49399I$
$u = 1.38810 - 0.33957I$ $a = 0.48176 + 1.67486I$ $b = -1.06352 - 2.91942I$	$3.48171 - 8.10374I$	$6.00000 + 4.49399I$
$u = 1.43331$ $a = 1.28549$ $b = -1.20757$	8.30021	10.1560
$u = 1.43493 + 0.26536I$ $a = 0.64645 - 1.33183I$ $b = -0.86486 + 2.42158I$	$9.31625 + 3.51006I$	$13.29415 + 0.I$
$u = 1.43493 - 0.26536I$ $a = 0.64645 + 1.33183I$ $b = -0.86486 - 2.42158I$	$9.31625 - 3.51006I$	$13.29415 + 0.I$
$u = -1.41859 + 0.34725I$ $a = -0.40165 - 1.57935I$ $b = 0.89723 + 2.93938I$	$8.28583 - 11.00080I$	$12.8696 + 5.9885I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.41859-0.34725I$ $a=-0.40165+1.57935I$ $b=\ 0.89723-2.93938I$	$8.28583+11.00080I$	$12.8696-5.9885I$
$u=\ 1.41768+0.36311I$ $a=\ 0.35041-1.60931I$ $b=-0.89725+3.02458I$	$5.9000+16.1532I$	$9.74356-9.72712I$
$u=\ 1.41768-0.36311I$ $a=\ 0.35041+1.60931I$ $b=-0.89725-3.02458I$	$5.9000-16.1532I$	$9.74356+9.72712I$
$u=-1.43323+0.29831I$ $a=-0.53750-1.42612I$ $b=\ 0.84249+2.64127I$	$10.04470-8.52981I$	$14.2743+6.4652I$
$u=-1.43323-0.29831I$ $a=-0.53750+1.42612I$ $b=\ 0.84249-2.64127I$	$10.04470+8.52981I$	$14.2743-6.4652I$
$u=-0.314010+0.390794I$ $a=\ 0.71540-1.22571I$ $b=\ 0.025527+0.500038I$	$-1.48480+2.02330I$	$2.63866+1.25082I$
$u=-0.314010-0.390794I$ $a=\ 0.71540+1.22571I$ $b=\ 0.025527-0.500038I$	$-1.48480-2.02330I$	$2.63866-1.25082I$
$u=-1.50324+0.03422I$ $a=-0.874162-0.174169I$ $b=\ 0.489019+0.337659I$	$13.70520-1.40021I$	$16.4192+0.I$
$u=-1.50324-0.03422I$ $a=-0.874162+0.174169I$ $b=\ 0.489019-0.337659I$	$13.70520+1.40021I$	$16.4192+0.I$
$u=-0.450369+0.202730I$ $a=\ 1.37562-0.88797I$ $b=-0.510703+0.597542I$	$-1.04042-4.50619I$	$4.53729+8.22316I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.450369-0.202730I$ $a=1.37562+0.88797I$ $b=-0.510703-0.597542I$	$-1.04042+4.50619I$	$4.53729-8.22316I$
$u=1.50640+0.06553I$ $a=0.834503-0.327285I$ $b=-0.448322+0.642057I$	$12.03530+6.55130I$	$13.7606-5.2864I$
$u=1.50640-0.06553I$ $a=0.834503+0.327285I$ $b=-0.448322-0.642057I$	$12.03530-6.55130I$	$13.7606+5.2864I$
$u=0.377334+0.098062I$ $a=-1.222090-0.396295I$ $b=0.510257+0.241115I$	$0.940032+0.385042I$	$10.54272-2.65749I$
$u=0.377334-0.098062I$ $a=-1.222090+0.396295I$ $b=0.510257-0.241115I$	$0.940032-0.385042I$	$10.54272+2.65749I$

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle 3u^{13} - u^{12} + \cdots + 11b - 9,\ 5u^{13} + 2u^{12} + \cdots + 11a - 15,\ u^{14} - 5u^{12} + \cdots - 2u - 1\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.454545u^{13} - 0.181818u^{12} + \cdots + 0.636364u + 1.36364 \\ -0.272727u^{13} + 0.0909091u^{12} + \cdots + 0.181818u + 0.818182 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{13} + 5u^{11} - 9u^9 - u^8 + 5u^7 + 4u^6 + 3u^5 - 6u^4 - 4u^3 + 2u^2 + 2 \\ -0.545455u^{13} + 0.181818u^{12} + \cdots + 0.363636u + 0.636364 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.636364u^{13} - 0.545455u^{12} + \cdots + 1.90909u - 0.909091 \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^5 - 2u^3 + u \\ -u^5 + u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.818182u^{13} + 0.272727u^{12} + \cdots + 0.545455u + 1.45455 \\ u^8 - 2u^6 + u^3 + 2u^2 - u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.454545u^{13} - 0.181818u^{12} + \cdots + 0.636364u + 1.36364 \\ -0.272727u^{13} + 0.0909091u^{12} + \cdots + 0.181818u + 0.818182 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.727273u^{13} - 0.0909091u^{12} + \cdots + 2.81818u + 1.18182 \\ 0.0909091u^{13} - 0.363636u^{12} + \cdots + 0.272727u - 0.272727 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= \frac{16}{11}u^{13} - \frac{20}{11}u^{12} - 4u^{11} + 4u^{10} + \frac{12}{11}u^9 + \frac{56}{11}u^8 + \frac{48}{11}u^7 - \frac{212}{11}u^6 - \frac{36}{11}u^5 + \frac{108}{11}u^4 + \frac{28}{11}u^3 + \frac{76}{11}u^2 - \frac{40}{11}u + \frac{18}{11}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^7+4u^6+8u^5+8u^4+4u^3+u^2+2u+1)^2$
c_2, c_7	$(u^7-2u^5+2u^3+u^2-1)^2$
c_3	$(u^7+5u^6+12u^5+17u^4+15u^3+5u^2-4u-4)^2$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$u^{14}-5u^{12}+9u^{10}+u^9-5u^8-4u^7-3u^6+6u^5+4u^4-2u^3-2u-1$
c_8	$(u^7+2u^5+2u^4+4u^3+u^2+2u-1)^2$
c_{12}	$(u^7+2u^5-2u^4+4u^3-u^2+2u+1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^7+8y^5-4y^4+24y^3-y^2+2y-1)^2$
c_2, c_7	$(y^7-4y^6+8y^5-8y^4+4y^3-y^2+2y-1)^2$
c_3	$(y^7-y^6+4y^5+13y^4-y^3-9y^2+56y-16)^2$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$y^{14}-10y^{13}+\cdots-4y+1$
c_8, c_{12}	$(y^7+4y^6+12y^5+16y^4+20y^3+19y^2+6y-1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.957061 + 0.519308I$ $a = 0.514399 + 0.255510I$ $b = -1.40007 - 0.49397I$	$5.11553 - 1.84683I$	$13.12815 + 1.09324I$
$u = 0.957061 - 0.519308I$ $a = 0.514399 - 0.255510I$ $b = -1.40007 + 0.49397I$	$5.11553 + 1.84683I$	$13.12815 - 1.09324I$
$u = -0.239949 + 0.878713I$ $a = -1.07659 + 1.37148I$ $b = 0.018151 + 0.213597I$	$0.63279 - 11.68630I$	$6.29693 + 8.84509I$
$u = -0.239949 - 0.878713I$ $a = -1.07659 - 1.37148I$ $b = 0.018151 - 0.213597I$	$0.63279 + 11.68630I$	$6.29693 - 8.84509I$
$u = 1.14029$ $a = -0.464314$ $b = 0.191074$	2.04041	4.35900
$u = -1.168590 + 0.306255I$ $a = 0.757257 + 0.859295I$ $b = -1.53466 - 1.20028I$	$-2.65620 - 3.76357I$	$1.39540 + 4.24459I$
$u = -1.168590 - 0.306255I$ $a = 0.757257 - 0.859295I$ $b = -1.53466 + 1.20028I$	$-2.65620 + 3.76357I$	$1.39540 - 4.24459I$
$u = -1.321610 + 0.182486I$ $a = -0.214561 - 0.416784I$ $b = 1.52571 + 1.12991I$	$5.11553 - 1.84683I$	$13.12815 + 1.09324I$
$u = -1.321610 - 0.182486I$ $a = -0.214561 + 0.416784I$ $b = 1.52571 - 1.12991I$	$5.11553 + 1.84683I$	$13.12815 - 1.09324I$
$u = 0.043481 + 0.649444I$ $a = 1.06596 + 1.83916I$ $b = -0.617135 + 0.405783I$	$-2.65620 + 3.76357I$	$1.39540 - 4.24459I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.043481 - 0.649444I$ $a = 1.06596 - 1.83916I$ $b = -0.617135 - 0.405783I$	$-2.65620 - 3.76357I$	$1.39540 + 4.24459I$
$u = 1.365780 + 0.312423I$ $a = -0.455826 + 1.037870I$ $b = 1.45156 - 2.32441I$	$0.63279 + 11.68630I$	$6.29693 - 8.84509I$
$u = 1.365780 - 0.312423I$ $a = -0.455826 - 1.037870I$ $b = 1.45156 + 2.32441I$	$0.63279 - 11.68630I$	$6.29693 + 8.84509I$
$u = -0.412656$ $a = 1.28304$ $b = 0.921809$	2.04041	4.35900

III.

$\boldsymbol{I_3^u = \langle 4.83\times 10^{10}u^{39} - 2.55\times 10^{10}u^{38} + \cdots + 4.32\times 10^{10}b - 2.77\times 10^{11},\ -1.99\times 10^{11}u^{39} + 3.22\times 10^{11}u^{38} + \cdots + 2.16\times 10^{11}a + 1.74\times 10^{12},\ u^{40} - u^{39} + \cdots + 6u + 5\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.921357u^{39} - 1.49158u^{38} + \cdots + 14.4435u - 8.06704 \\ -1.11838u^{39} + 0.589868u^{38} + \cdots - 8.45803u + 6.41594 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{5}u^{39} - \frac{1}{5}u^{38} + \cdots + \frac{24}{5}u + \frac{6}{5} \\ -0.721357u^{39} + 1.29158u^{38} + \cdots - 8.64350u + 9.26704 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1.85341u^{39} + 1.13205u^{38} + \cdots - 56.5699u - 19.7639 \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^5 - 2u^3 + u \\ -u^5 + u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -0.141219u^{39} + 0.286734u^{38} + \cdots + 12.4150u + 9.11906 \\ 0.874874u^{39} - 1.11047u^{38} + \cdots + 30.2577u + 9.75078 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.125054u^{39} - 0.909866u^{38} + \cdots + 16.1112u + 2.54657 \\ -0.585648u^{39} + 1.51958u^{38} + \cdots - 12.9285u + 8.73631 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -1.29679u^{39} - 0.118839u^{38} + \cdots + 35.8131u + 24.9355 \\ 4.70549u^{39} - 0.173819u^{38} + \cdots - 4.96586u - 15.7106 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$$= -\frac{241664643308}{43198696939}u^{39} + \frac{123235657656}{43198696939}u^{38} + \cdots - \frac{438305923412}{43198696939}u + \frac{1059211366526}{43198696939}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^{20}+9u^{19}+\cdots+2u^2+1)^2$
c_2, c_7	$(u^{20}-u^{19}+\cdots-2u+1)^2$
c_3	$(u^{10}-2u^9+u^8+4u^6-6u^5+u^4+6u^3-5u^2+1)^4$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$u^{40}-u^{39}+\cdots+6u+5$
c_8	$(u^{20}-3u^{19}+\cdots-16u+5)^2$
c_{12}	$(u^{20}+3u^{19}+\cdots+16u+5)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^{20} + 3y^{19} + \cdots + 4y + 1)^2$
c_2, c_7	$(y^{20} - 9y^{19} + \cdots + 2y^2 + 1)^2$
c_3	$(y^{10} - 2y^9 + \cdots - 10y + 1)^4$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$y^{40} - 31y^{39} + \cdots + 204y + 25$
c_8, c_{12}	$(y^{20} + 3y^{19} + \cdots + 204y + 25)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.805245 + 0.548498I$ $a = 0.484950 + 0.496101I$ $b = -1.063550 - 0.519102I$	5.84675	$14.3672 + 0.I$
$u = 0.805245 - 0.548498I$ $a = 0.484950 - 0.496101I$ $b = -1.063550 + 0.519102I$	5.84675	$14.3672 + 0.I$
$u = -0.729774 + 0.602283I$ $a = -0.541328 + 0.641388I$ $b = 0.884543 - 0.553467I$	$4.40946 - 4.65452I$	$11.20346 + 6.04247I$
$u = -0.729774 - 0.602283I$ $a = -0.541328 - 0.641388I$ $b = 0.884543 + 0.553467I$	$4.40946 + 4.65452I$	$11.20346 - 6.04247I$
$u = -1.066160 + 0.285066I$ $a = 0.937984 + 0.759238I$ $b = -1.51409 - 0.75635I$	$-1.54326 + 3.92983I$	$2.95600 - 3.21471I$
$u = -1.066160 - 0.285066I$ $a = 0.937984 - 0.759238I$ $b = -1.51409 + 0.75635I$	$-1.54326 - 3.92983I$	$2.95600 + 3.21471I$
$u = 0.254311 + 0.850232I$ $a = 1.03350 + 1.37276I$ $b = -0.082493 + 0.163450I$	$2.96491 + 6.68616I$	$9.50669 - 5.21994I$
$u = 0.254311 - 0.850232I$ $a = 1.03350 - 1.37276I$ $b = -0.082493 - 0.163450I$	$2.96491 - 6.68616I$	$9.50669 + 5.21994I$
$u = -1.041820 + 0.410831I$ $a = -0.406675 + 0.084930I$ $b = 1.53742 - 0.18333I$	$1.016470 - 0.519983I$	$6.28339 + 0.77505I$
$u = -1.041820 - 0.410831I$ $a = -0.406675 - 0.084930I$ $b = 1.53742 + 0.18333I$	$1.016470 + 0.519983I$	$6.28339 - 0.77505I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.006990 + 0.539596I$ $a = -0.566442 + 0.194865I$ $b = 1.53566 - 0.53787I$	$2.96491 + 6.68616I$	$9.50669 - 5.21994I$
$u = -1.006990 - 0.539596I$ $a = -0.566442 - 0.194865I$ $b = 1.53566 + 0.53787I$	$2.96491 - 6.68616I$	$9.50669 + 5.21994I$
$u = 1.120430 + 0.232272I$ $a = -0.796352 + 0.683257I$ $b = 1.25298 - 0.91224I$	$1.016470 + 0.519983I$	$6.28339 - 0.77505I$
$u = 1.120430 - 0.232272I$ $a = -0.796352 - 0.683257I$ $b = 1.25298 + 0.91224I$	$1.016470 - 0.519983I$	$6.28339 + 0.77505I$
$u = 0.331708 + 0.777509I$ $a = 0.88385 + 1.31325I$ $b = -0.233626 - 0.031651I$	$4.40946 + 4.65452I$	$11.20346 - 6.04247I$
$u = 0.331708 - 0.777509I$ $a = 0.88385 - 1.31325I$ $b = -0.233626 + 0.031651I$	$4.40946 - 4.65452I$	$11.20346 + 6.04247I$
$u = -0.196460 + 0.818278I$ $a = -1.03861 + 1.46561I$ $b = 0.189464 + 0.280707I$	$-1.54326 - 3.92983I$	$2.95600 + 3.21471I$
$u = -0.196460 - 0.818278I$ $a = -1.03861 - 1.46561I$ $b = 0.189464 - 0.280707I$	$-1.54326 + 3.92983I$	$2.95600 - 3.21471I$
$u = -0.399715 + 0.718129I$ $a = -0.74940 + 1.23357I$ $b = 0.366223 - 0.161582I$	3.48717	$9.73375 + 0.I$
$u = -0.399715 - 0.718129I$ $a = -0.74940 - 1.23357I$ $b = 0.366223 + 0.161582I$	3.48717	$9.73375 + 0.I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.237360 + 0.242641I$ $a = 0.263575 - 0.258220I$ $b = -1.58490 + 0.63271I$	$1.016470 - 0.519983I$	$6.00000 + 0.77505I$
$u = 1.237360 - 0.242641I$ $a = 0.263575 + 0.258220I$ $b = -1.58490 - 0.63271I$	$1.016470 + 0.519983I$	$6.00000 - 0.77505I$
$u = -1.333230 + 0.081709I$ $a = -0.057993 - 0.502701I$ $b = 1.01747 + 1.42606I$	5.84675	$14.3672 + 0.I$
$u = -1.333230 - 0.081709I$ $a = -0.057993 + 0.502701I$ $b = 1.01747 - 1.42606I$	5.84675	$14.3672 + 0.I$
$u = 1.341140 + 0.170431I$ $a = -0.334067 + 0.811377I$ $b = 0.56237 - 2.00124I$	3.48717	$6.00000 + 0.I$
$u = 1.341140 - 0.170431I$ $a = -0.334067 - 0.811377I$ $b = 0.56237 + 2.00124I$	3.48717	$6.00000 + 0.I$
$u = 1.316030 + 0.310134I$ $a = -0.523422 + 0.987925I$ $b = 1.46616 - 2.00702I$	$-1.54326 + 3.92983I$	0
$u = 1.316030 - 0.310134I$ $a = -0.523422 - 0.987925I$ $b = 1.46616 + 2.00702I$	$-1.54326 - 3.92983I$	0
$u = 1.337970 + 0.218560I$ $a = 0.279010 - 0.420680I$ $b = -1.73917 + 1.10941I$	$2.96491 + 6.68616I$	0
$u = 1.337970 - 0.218560I$ $a = 0.279010 + 0.420680I$ $b = -1.73917 - 1.10941I$	$2.96491 - 6.68616I$	0

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.356430 + 0.031317I$ $a = -0.007062 - 0.585271I$ $b = -0.76651 + 1.67915I$	$4.40946 - 4.65452I$	$11.20346 + 6.04247I$
$u = 1.356430 - 0.031317I$ $a = -0.007062 + 0.585271I$ $b = -0.76651 - 1.67915I$	$4.40946 + 4.65452I$	$11.20346 - 6.04247I$
$u = -1.348070 + 0.225139I$ $a = 0.389964 + 0.898034I$ $b = -0.90232 - 2.12727I$	$4.40946 - 4.65452I$	0
$u = -1.348070 - 0.225139I$ $a = 0.389964 - 0.898034I$ $b = -0.90232 + 2.12727I$	$4.40946 + 4.65452I$	0
$u = -1.356410 + 0.293193I$ $a = 0.450021 + 1.002480I$ $b = -1.33232 - 2.25052I$	$2.96491 - 6.68616I$	0
$u = -1.356410 - 0.293193I$ $a = 0.450021 - 1.002480I$ $b = -1.33232 + 2.25052I$	$2.96491 + 6.68616I$	0
$u = -0.062616 + 0.525185I$ $a = 1.28999 + 2.16247I$ $b = -0.857635 + 0.387749I$	$-1.54326 - 3.92983I$	$2.95600 + 3.21471I$
$u = -0.062616 - 0.525185I$ $a = 1.28999 - 2.16247I$ $b = -0.857635 - 0.387749I$	$-1.54326 + 3.92983I$	$2.95600 - 3.21471I$
$u = -0.059388 + 0.505857I$ $a = -0.89150 + 2.18224I$ $b = 0.764328 + 0.264884I$	$1.016470 - 0.519983I$	$6.28339 + 0.77505I$
$u = -0.059388 - 0.505857I$ $a = -0.89150 - 2.18224I$ $b = 0.764328 - 0.264884I$	$1.016470 + 0.519983I$	$6.28339 - 0.77505I$

IV. $I_4^u = \langle b + a - 1,\ a^4 + 2a^2 + 2,\ u + 1 \rangle$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} a \\ -a + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a + 1 \\ -a \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -a \\ a - 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

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

$$a_8 = \begin{pmatrix} a \\ 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -2a^2 - 2 \\ a^3 + a^2 + 1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

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

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = \ \ 0.455090 + 1.098680I$ $b = \ \ 0.544910 - 1.098680I$	$0.82247 + 3.66386I$	$8.00000 - 4.00000I$
$u = -1.00000$ $a = \ \ 0.455090 - 1.098680I$ $b = \ \ 0.544910 + 1.098680I$	$0.82247 - 3.66386I$	$8.00000 + 4.00000I$
$u = -1.00000$ $a = -0.455090 + 1.098680I$ $b = \ \ 1.45509 - 1.09868I$	$0.82247 - 3.66386I$	$8.00000 + 4.00000I$
$u = -1.00000$ $a = -0.455090 - 1.098680I$ $b = \ \ 1.45509 + 1.09868I$	$0.82247 + 3.66386I$	$8.00000 - 4.00000I$

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4a^2 + 12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = 0$ $b = -1.00000$	3.28987	12.0000
$u = 1.00000$ $a = 0$ $b = -1.00000$	3.28987	12.0000
$u = 1.00000$ $a = 0$ $b = -1.00000$	3.28987	12.0000

VI. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$u^3(u^2-2u+2)^2(u^7+4u^6+8u^5+8u^4+4u^3+u^2+2u+1)^2$ $\cdot((u^{20}+9u^{19}+\cdots+2u^2+1)^2)(u^{35}+17u^{34}+\cdots+4u+4)$
c_2, c_7	$u^3(u^4-2u^2+2)(u^7-2u^5+\cdots+u^2-1)^2(u^{20}-u^{19}+\cdots-2u+1)^2$ $\cdot(u^{35}+3u^{34}+\cdots+6u+2)$
c_3	$u^3(u^4+2u^2+2)(u^7+5u^6+12u^5+17u^4+15u^3+5u^2-4u-4)^2$ $\cdot(u^{10}-2u^9+u^8+4u^6-6u^5+u^4+6u^3-5u^2+1)^4$ $\cdot(u^{35}-3u^{34}+\cdots+72u+296)$
c_4, c_5, c_9 c_{10}	$(u-1)^3(u+1)^4$ $\cdot(u^{14}-5u^{12}+9u^{10}+u^9-5u^8-4u^7-3u^6+6u^5+4u^4-2u^3-2u-1)$ $\cdot(u^{35}-u^{34}+\cdots+5u^2-1)(u^{40}-u^{39}+\cdots+6u+5)$
c_6, c_{11}	$(u-1)^4(u+1)^3$ $\cdot(u^{14}-5u^{12}+9u^{10}+u^9-5u^8-4u^7-3u^6+6u^5+4u^4-2u^3-2u-1)$ $\cdot(u^{35}-u^{34}+\cdots+5u^2-1)(u^{40}-u^{39}+\cdots+6u+5)$
c_8	$u^3(u^4+2u^2+2)(u^7+2u^5+2u^4+4u^3+u^2+2u-1)^2$ $\cdot((u^{20}-3u^{19}+\cdots-16u+5)^2)(u^{35}+9u^{34}+\cdots-70u-46)$
c_{12}	$u^7(u^7+2u^5+\cdots+2u+1)^2(u^{20}+3u^{19}+\cdots+16u+5)^2$ $\cdot(u^{35}+3u^{34}+\cdots+256u+256)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$y^3(y^2+4)^2(y^7+8y^5-4y^4+24y^3-y^2+2y-1)^2$ $\cdot((y^{20}+3y^{19}+\cdots+4y+1)^2)(y^{35}+3y^{34}+\cdots-240y-16)$
c_2, c_7	$y^3(y^2-2y+2)^2(y^7-4y^6+8y^5-8y^4+4y^3-y^2+2y-1)^2$ $\cdot((y^{20}-9y^{19}+\cdots+2y^2+1)^2)(y^{35}-17y^{34}+\cdots+4y-4)$
c_3	$y^3(y^2+2y+2)^2(y^7-y^6+4y^5+13y^4-y^3-9y^2+56y-16)^2$ $\cdot((y^{10}-2y^9+\cdots-10y+1)^4)(y^{35}-y^{34}+\cdots+704928y-87616)$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$((y-1)^7)(y^{14}-10y^{13}+\cdots-4y+1)(y^{35}-37y^{34}+\cdots+10y-1)$ $\cdot(y^{40}-31y^{39}+\cdots+204y+25)$
c_8	$y^3(y^2+2y+2)^2(y^7+4y^6+12y^5+16y^4+20y^3+19y^2+6y-1)^2$ $\cdot((y^{20}+3y^{19}+\cdots+204y+25)^2)(y^{35}+11y^{34}+\cdots+28820y-2116)$
c_{12}	$y^7(y^7+4y^6+12y^5+16y^4+20y^3+19y^2+6y-1)^2$ $\cdot(y^{20}+3y^{19}+\cdots+204y+25)^2$ $\cdot(y^{35}+7y^{34}+\cdots+1441792y-65536)$