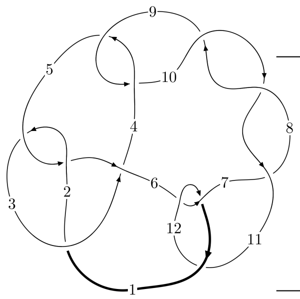
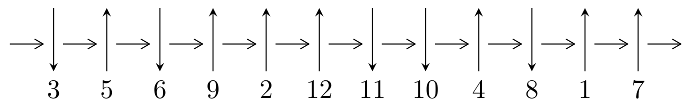
$12a_{0032}$ $(K12a_{0032})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle 4u^{72} + 9u^{71} + \cdots + b - 5,\ 3u^{72} + 6u^{71} + \cdots + 2a - 5,\ u^{73} + 3u^{72} + \cdots - 4u - 1\rangle$$
$$I_2^u = \langle b,\ a^2 - a + 1,\ u - 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 75 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.

$$I_1^u = \langle 4u^{72}+9u^{71}+\cdots+b-5,\ 3u^{72}+6u^{71}+\cdots+2a-5,\ u^{73}+3u^{72}+\cdots-4u-1\rangle$$

(i) Arc colorings

$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -\frac{3}{2}u^{72} - 3u^{71} + \cdots + \frac{9}{2}u + \frac{5}{2} \\ -4u^{72} - 9u^{71} + \cdots + 14u + 5 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{2}u^{72} - u^{71} + \cdots - \frac{3}{2}u + \frac{1}{2} \\ u^{29} - 9u^{27} + \cdots + 2u^2 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 2u^{72} + 5u^{71} + \cdots - 8u - 2 \\ -\frac{15}{2}u^{72} - 17u^{71} + \cdots + \frac{53}{2}u + \frac{19}{2} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 5u^{72} + 11u^{71} + \cdots - 18u - 6 \\ \frac{3}{2}u^{72} + 3u^{71} + \cdots - \frac{7}{2}u - \frac{3}{2} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^2 + 1 \\ u^4 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - u^5 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^8 + 3u^6 - 3u^4 + 1 \\ u^{10} - 2u^8 + u^6 + 2u^4 - u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^{11} + 4u^9 - 6u^7 + 2u^5 + 3u^3 - 2u \\ u^{13} - 3u^{11} + 3u^9 + 2u^7 - 4u^5 + u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -18u^{72} - 43u^{71} + \cdots + 66u + 25$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{73}+32u^{72}+\cdots+11u-1$
c_2, c_5	$u^{73}+2u^{72}+\cdots-u-1$
c_3	$u^{73}-2u^{72}+\cdots+165u-17$
c_4, c_9	$u^{73}+u^{72}+\cdots+4u-4$
c_6, c_{12}	$u^{73}+3u^{72}+\cdots-4u-1$
c_7, c_8, c_{10}	$u^{73}+15u^{72}+\cdots-216u-16$
c_{11}	$u^{73}-43u^{72}+\cdots-2u-1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{73} + 20y^{72} + \cdots + 275y - 1$
c_2, c_5	$y^{73} + 32y^{72} + \cdots + 11y - 1$
c_3	$y^{73} + 8y^{72} + \cdots - 6877y - 289$
c_4, c_9	$y^{73} + 15y^{72} + \cdots - 216y - 16$
c_6, c_{12}	$y^{73} - 43y^{72} + \cdots - 2y - 1$
c_7, c_8, c_{10}	$y^{73} + 83y^{72} + \cdots + 4384y - 256$
c_{11}	$y^{73} - 23y^{72} + \cdots + 38y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.796832+0.538347I$ $a=-2.31129+0.06801I$ $b=\ \ 1.70540-1.05275I$	$-4.24142-5.70697I$	0
$u=-0.796832-0.538347I$ $a=-2.31129-0.06801I$ $b=\ \ 1.70540+1.05275I$	$-4.24142+5.70697I$	0
$u=\ \ 0.899085+0.326015I$ $a=\ \ 0.02535-2.32970I$ $b=-0.58316+2.15466I$	$0.082824+0.160201I$	0
$u=\ \ 0.899085-0.326015I$ $a=\ \ 0.02535+2.32970I$ $b=-0.58316-2.15466I$	$0.082824-0.160201I$	0
$u=-1.030080+0.324784I$ $a=\ \ 0.645259-0.737289I$ $b=\ \ 0.428910-0.037104I$	$2.50971+0.29837I$	0
$u=-1.030080-0.324784I$ $a=\ \ 0.645259+0.737289I$ $b=\ \ 0.428910+0.037104I$	$2.50971-0.29837I$	0
$u=-0.060471+0.908501I$ $a=-1.143350+0.045300I$ $b=-0.15329-1.46139I$	$6.24864+10.27490I$	$2.89542-7.01845I$
$u=-0.060471-0.908501I$ $a=-1.143350-0.045300I$ $b=-0.15329+1.46139I$	$6.24864-10.27490I$	$2.89542+7.01845I$
$u=-0.045023+0.902001I$ $a=\ \ 1.048390-0.026697I$ $b=\ \ 0.425897+0.828457I$	$8.09212+4.88858I$	$5.55498-2.56495I$
$u=-0.045023-0.902001I$ $a=\ \ 1.048390+0.026697I$ $b=\ \ 0.425897-0.828457I$	$8.09212-4.88858I$	$5.55498+2.56495I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.027830 + 0.411352I$ $a = -2.75340 - 1.31041I$ $b = 2.13202 + 2.36044I$	$1.86319 + 6.29573I$	0
$u = 1.027830 - 0.411352I$ $a = -2.75340 + 1.31041I$ $b = 2.13202 - 2.36044I$	$1.86319 - 6.29573I$	0
$u = -0.992153 + 0.494153I$ $a = -0.13867 + 1.47620I$ $b = -0.25797 - 1.67319I$	$-2.09315 - 4.25967I$	0
$u = -0.992153 - 0.494153I$ $a = -0.13867 - 1.47620I$ $b = -0.25797 + 1.67319I$	$-2.09315 + 4.25967I$	0
$u = -0.003685 + 0.885221I$ $a = 1.061200 + 0.001583I$ $b = 0.448605 - 0.796552I$	$8.26656 + 1.57314I$	$5.85573 - 2.28832I$
$u = -0.003685 - 0.885221I$ $a = 1.061200 - 0.001583I$ $b = 0.448605 + 0.796552I$	$8.26656 - 1.57314I$	$5.85573 + 2.28832I$
$u = 1.061310 + 0.358999I$ $a = 1.73187 + 0.46057I$ $b = -1.55065 - 1.27425I$	$3.61712 + 1.77427I$	0
$u = 1.061310 - 0.358999I$ $a = 1.73187 - 0.46057I$ $b = -1.55065 + 1.27425I$	$3.61712 - 1.77427I$	0
$u = -1.055210 + 0.377398I$ $a = 0.143235 + 0.585101I$ $b = -0.653103 + 0.376649I$	$3.48602 - 4.64873I$	0
$u = -1.055210 - 0.377398I$ $a = 0.143235 - 0.585101I$ $b = -0.653103 - 0.376649I$	$3.48602 + 4.64873I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.014910 + 0.877594I$ $a = -1.170160 + 0.036770I$ $b = -0.15465 + 1.42320I$	$6.56651 - 3.81304I$	$3.48761 + 2.37237I$
$u = 0.014910 - 0.877594I$ $a = -1.170160 - 0.036770I$ $b = -0.15465 - 1.42320I$	$6.56651 + 3.81304I$	$3.48761 - 2.37237I$
$u = -0.745666 + 0.449141I$ $a = 1.241710 - 0.206618I$ $b = -0.615729 + 0.808004I$	$-1.60556 - 1.91846I$	$-0.83992 + 4.54593I$
$u = -0.745666 - 0.449141I$ $a = 1.241710 + 0.206618I$ $b = -0.615729 - 0.808004I$	$-1.60556 + 1.91846I$	$-0.83992 - 4.54593I$
$u = -0.663356 + 0.548451I$ $a = -1.09116 + 1.48131I$ $b = 0.05851 - 1.82675I$	$-4.60806 + 1.34225I$	$-6.07081 - 0.60893I$
$u = -0.663356 - 0.548451I$ $a = -1.09116 - 1.48131I$ $b = 0.05851 + 1.82675I$	$-4.60806 - 1.34225I$	$-6.07081 + 0.60893I$
$u = -0.044946 + 0.858380I$ $a = -0.926262 - 0.036801I$ $b = 0.583114 - 0.035791I$	$2.49214 + 3.07068I$	$-0.36042 - 2.48054I$
$u = -0.044946 - 0.858380I$ $a = -0.926262 + 0.036801I$ $b = 0.583114 + 0.035791I$	$2.49214 - 3.07068I$	$-0.36042 + 2.48054I$
$u = 1.148100 + 0.066282I$ $a = 0.481281 - 0.828556I$ $b = -0.072635 + 0.333417I$	$0.94991 + 1.54341I$	0
$u = 1.148100 - 0.066282I$ $a = 0.481281 + 0.828556I$ $b = -0.072635 - 0.333417I$	$0.94991 - 1.54341I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.831297$ $a = 1.18611$ $b = -0.878157$	1.20245	8.84780
$u = -1.067090 + 0.480663I$ $a = 1.43081 - 0.55418I$ $b = -1.10301 + 1.47768I$	$2.23047 - 6.58216I$	0
$u = -1.067090 - 0.480663I$ $a = 1.43081 + 0.55418I$ $b = -1.10301 - 1.47768I$	$2.23047 + 6.58216I$	0
$u = 1.143120 + 0.264741I$ $a = 0.321926 - 0.475229I$ $b = -0.765191 - 0.174011I$	$3.87826 + 0.47986I$	0
$u = 1.143120 - 0.264741I$ $a = 0.321926 + 0.475229I$ $b = -0.765191 + 0.174011I$	$3.87826 - 0.47986I$	0
$u = -1.072090 + 0.517956I$ $a = -2.16667 + 1.15750I$ $b = 1.50805 - 2.21750I$	$0.09169 - 11.38030I$	0
$u = -1.072090 - 0.517956I$ $a = -2.16667 - 1.15750I$ $b = 1.50805 + 2.21750I$	$0.09169 + 11.38030I$	0
$u = 1.189960 + 0.217721I$ $a = 0.538138 + 0.733544I$ $b = 0.386122 - 0.182674I$	$2.38629 - 3.99102I$	0
$u = 1.189960 - 0.217721I$ $a = 0.538138 - 0.733544I$ $b = 0.386122 + 0.182674I$	$2.38629 + 3.99102I$	0
$u = -0.759472 + 0.078072I$ $a = 0.409671 + 1.121040I$ $b = -0.025028 + 0.368371I$	$0.90189 - 2.32067I$	$-2.23029 + 5.61700I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.759472 - 0.078072I$ $a = 0.409671 - 1.121040I$ $b = -0.025028 - 0.368371I$	$0.90189 + 2.32067I$	$-2.23029 - 5.61700I$
$u = -0.294691 + 0.697762I$ $a = -1.52227 + 0.52821I$ $b = 0.04655 - 1.54343I$	$-2.13058 + 6.78357I$	$-1.78763 - 7.49032I$
$u = -0.294691 - 0.697762I$ $a = -1.52227 - 0.52821I$ $b = 0.04655 + 1.54343I$	$-2.13058 - 6.78357I$	$-1.78763 + 7.49032I$
$u = -0.411090 + 0.594862I$ $a = -1.33198 - 0.64422I$ $b = 1.058470 - 0.183219I$	$-3.71919 - 0.03530I$	$-5.73582 - 0.13433I$
$u = -0.411090 - 0.594862I$ $a = -1.33198 + 0.64422I$ $b = 1.058470 + 0.183219I$	$-3.71919 + 0.03530I$	$-5.73582 + 0.13433I$
$u = 0.638508 + 0.276958I$ $a = -2.85677 + 1.41704I$ $b = 2.23207 - 0.27893I$	$-0.67209 + 2.83977I$	$0.57232 - 5.77641I$
$u = 0.638508 - 0.276958I$ $a = -2.85677 - 1.41704I$ $b = 2.23207 + 0.27893I$	$-0.67209 - 2.83977I$	$0.57232 + 5.77641I$
$u = 1.245740 + 0.440942I$ $a = 0.151191 - 1.053990I$ $b = -0.087474 + 1.281280I$	$6.38924 + 1.49871I$	0
$u = 1.245740 - 0.440942I$ $a = 0.151191 + 1.053990I$ $b = -0.087474 - 1.281280I$	$6.38924 - 1.49871I$	0
$u = -1.237210 + 0.485257I$ $a = 0.092149 + 1.060120I$ $b = -0.069199 - 1.349010I$	$6.06816 - 7.90409I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.237210-0.485257I$ $a=\ \ 0.092149-1.060120I$ $b=-0.069199+1.349010I$	$6.06816+7.90409I$	0
$u=-0.247172+0.623477I$ $a=\ \ 1.109370-0.156214I$ $b=\ \ 0.146837+0.686540I$	$-0.05164+2.31958I$	$1.90774-3.63180I$
$u=-0.247172-0.623477I$ $a=\ \ 1.109370+0.156214I$ $b=\ \ 0.146837-0.686540I$	$-0.05164-2.31958I$	$1.90774+3.63180I$
$u=-1.254650+0.458550I$ $a=\ \ 0.571192-0.618053I$ $b=\ \ 0.654999+0.111159I$	$10.41650-0.92595I$	0
$u=-1.254650-0.458550I$ $a=\ \ 0.571192+0.618053I$ $b=\ \ 0.654999-0.111159I$	$10.41650+0.92595I$	0
$u=\ \ 1.250410+0.474243I$ $a=-1.64704-1.66951I$ $b=\ \ 0.99899+2.81058I$	$10.30140+8.63802I$	0
$u=\ \ 1.250410-0.474243I$ $a=-1.64704+1.66951I$ $b=\ \ 0.99899-2.81058I$	$10.30140-8.63802I$	0
$u=\ \ 1.257260+0.465604I$ $a=\ \ 1.34060+0.93797I$ $b=-1.14852-2.06285I$	$12.09550+3.22867I$	0
$u=\ \ 1.257260-0.465604I$ $a=\ \ 1.34060-0.93797I$ $b=-1.14852+2.06285I$	$12.09550-3.22867I$	0
$u=-1.256050+0.469575I$ $a=\ \ 0.076133+0.366803I$ $b=-0.925574+0.435365I$	$12.06620-6.39600I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.256050-0.469575I$ $a=\ \ 0.076133-0.366803I$ $b=-0.925574-0.435365I$	$12.06620+6.39600I$	0
$u=\ \ 1.273530+0.443626I$ $a=\ \ 0.096224-0.351788I$ $b=-0.940708-0.404721I$	$12.14430-0.14495I$	0
$u=\ \ 1.273530-0.443626I$ $a=\ \ 0.096224+0.351788I$ $b=-0.940708+0.404721I$	$12.14430+0.14495I$	0
$u=-1.256320+0.493887I$ $a=\ \ 1.29631-0.89917I$ $b=-1.07374+2.03687I$	$11.7702-9.8863I$	0
$u=-1.256320-0.493887I$ $a=\ \ 1.29631+0.89917I$ $b=-1.07374-2.03687I$	$11.7702+9.8863I$	0
$u=\ \ 1.279930+0.434233I$ $a=\ \ 0.556079+0.623274I$ $b=\ \ 0.648052-0.146041I$	$10.39010-5.55528I$	0
$u=\ \ 1.279930-0.434233I$ $a=\ \ 0.556079-0.623274I$ $b=\ \ 0.648052+0.146041I$	$10.39010+5.55528I$	0
$u=-1.255820+0.502698I$ $a=-1.60562+1.57330I$ $b=\ \ 0.94296-2.71614I$	$9.8802-15.3350I$	0
$u=-1.255820-0.502698I$ $a=-1.60562-1.57330I$ $b=\ \ 0.94296+2.71614I$	$9.8802+15.3350I$	0
$u=-0.014084+0.462153I$ $a=\ \ 1.42124+0.30256I$ $b=\ \ 0.409463-0.530113I$	$0.89929+1.38203I$	$4.27247-4.11780I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.014084 - 0.462153I$ $a = 1.42124 - 0.30256I$ $b = 0.409463 + 0.530113I$	$0.89929 - 1.38203I$	$4.27247 + 4.11780I$
$u = 0.217836 + 0.395971I$ $a = -2.71775 - 0.62754I$ $b = 0.30369 + 1.39444I$	$-0.21204 - 2.78157I$	$2.07158 + 2.47908I$
$u = 0.217836 - 0.395971I$ $a = -2.71775 + 0.62754I$ $b = 0.30369 - 1.39444I$	$-0.21204 + 2.78157I$	$2.07158 - 2.47908I$

II. $I_2^u = \langle b,\ a^2 - a + 1,\ u - 1 \rangle$

(i) Arc colorings

$a_7 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

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

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

$a_3 = \begin{pmatrix} a \\ 0 \end{pmatrix}$

$a_2 = \begin{pmatrix} a \\ -1 \end{pmatrix}$

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

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

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

$a_{11} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$a_8 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$a_{10} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$a_9 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4a + 7$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000		
$a =$	$0.500000 + 0.866025I$	$1.64493 - 2.02988I$	$9.00000 + 3.46410I$
$b =$	0		
$u =$	1.00000		
$a =$	$0.500000 - 0.866025I$	$1.64493 + 2.02988I$	$9.00000 - 3.46410I$
$b =$	0		

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$(u^2-u+1)(u^{73}+32u^{72}+\cdots+11u-1)$
c_2	$(u^2+u+1)(u^{73}+2u^{72}+\cdots-u-1)$
c_3	$(u^2-u+1)(u^{73}-2u^{72}+\cdots+165u-17)$
c_4, c_9	$u^2(u^{73}+u^{72}+\cdots+4u-4)$
c_5	$(u^2-u+1)(u^{73}+2u^{72}+\cdots-u-1)$
c_6	$((u+1)^2)(u^{73}+3u^{72}+\cdots-4u-1)$
c_7, c_8, c_{10}	$u^2(u^{73}+15u^{72}+\cdots-216u-16)$
c_{11}	$((u+1)^2)(u^{73}-43u^{72}+\cdots-2u-1)$
c_{12}	$((u-1)^2)(u^{73}+3u^{72}+\cdots-4u-1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$(y^2+y+1)(y^{73}+20y^{72}+\cdots+275y-1)$
c_2, c_5	$(y^2+y+1)(y^{73}+32y^{72}+\cdots+11y-1)$
c_3	$(y^2+y+1)(y^{73}+8y^{72}+\cdots-6877y-289)$
c_4, c_9	$y^2(y^{73}+15y^{72}+\cdots-216y-16)$
c_6, c_{12}	$((y-1)^2)(y^{73}-43y^{72}+\cdots-2y-1)$
c_7, c_8, c_{10}	$y^2(y^{73}+83y^{72}+\cdots+4384y-256)$
c_{11}	$((y-1)^2)(y^{73}-23y^{72}+\cdots+38y-1)$