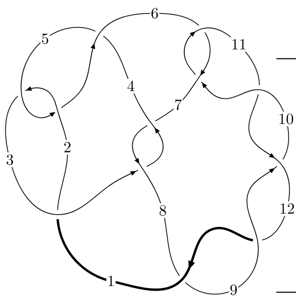
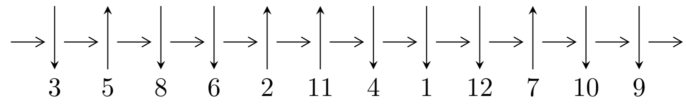
$12a_{0128}$ $(K12a_{0128})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle -u^{56} + 2u^{55} + \cdots + 2b - 4u,\ u^{54} - 2u^{53} + \cdots + 2a - 1,\ u^{58} - 3u^{57} + \cdots - 3u + 1 \rangle$$
$$I_2^u = \langle u^2 a + u^2 + b,\ -u^2 a - u^3 + a^2 + au + u^2 + a - u,\ u^4 - u^3 + u^2 + 1 \rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 66 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. $\boldsymbol{I_1^u} =$
$\langle -u^{56}+2u^{55}+\cdots+2b-4u,\ u^{54}-2u^{53}+\cdots+2a-1,\ u^{58}-3u^{57}+\cdots-3u+1\rangle$

(i) Arc colorings

$$a_6 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-\frac{1}{2}u^{54}+u^{53}+\cdots-\frac{1}{2}u+\frac{1}{2}\\ \frac{1}{2}u^{56}-u^{55}+\cdots-\frac{5}{2}u^2+2u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u^{57}+\frac{3}{2}u^{56}+\cdots+\frac{13}{2}u-\frac{1}{2}\\ -u^{57}+\frac{5}{2}u^{56}+\cdots+\frac{17}{2}u^2-u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}2u^{56}-2u^{55}+\cdots+\frac{15}{2}u-\frac{1}{2}\\ -2u^{57}+\frac{7}{2}u^{56}+\cdots+\frac{17}{2}u^2-u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^7-2u^3\\ u^9+u^7+3u^5+2u^3+u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}-2u^{57}+4u^{56}+\cdots+\frac{11}{2}u-\frac{1}{2}\\ -u^{57}+\frac{5}{2}u^{56}+\cdots+\frac{17}{2}u^2-u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^9+3u^5+u\\ -u^{11}-u^9-4u^7-3u^5-3u^3-u\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}-u\\ u^3+u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}-u^3\\ u^5+u^3+u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^5-u\\ u^7+u^5+2u^3+u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -\frac{15}{2}u^{57}+12u^{56}+\cdots-\frac{51}{2}u-\frac{1}{2}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4	$u^{58} + 17u^{57} + \cdots + 49u + 1$
c_2, c_5	$u^{58} + 5u^{57} + \cdots + u + 1$
c_3, c_7	$u^{58} - u^{57} + \cdots + 384u + 256$
c_6, c_{10}	$u^{58} - 3u^{57} + \cdots - 3u + 1$
c_8, c_9, c_{11} c_{12}	$u^{58} + 11u^{57} + \cdots + 21u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4	$y^{58} + 53y^{57} + \cdots - 451y + 1$
c_2, c_5	$y^{58} + 17y^{57} + \cdots + 49y + 1$
c_3, c_7	$y^{58} + 45y^{57} + \cdots + 475136y + 65536$
c_6, c_{10}	$y^{58} + 11y^{57} + \cdots + 21y + 1$
c_8, c_9, c_{11} c_{12}	$y^{58} + 75y^{57} + \cdots + 45y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.236171 + 0.966829I$ $a = -0.773305 + 0.432884I$ $b = -0.777739 + 0.842309I$	$2.58788 - 0.06234I$	$-2.29623 - 1.17460I$
$u = 0.236171 - 0.966829I$ $a = -0.773305 - 0.432884I$ $b = -0.777739 - 0.842309I$	$2.58788 + 0.06234I$	$-2.29623 + 1.17460I$
$u = -0.789321 + 0.603582I$ $a = 1.49361 - 0.38105I$ $b = -0.866625 + 0.810195I$	$8.82733 - 0.53338I$	$4.24509 + 1.90410I$
$u = -0.789321 - 0.603582I$ $a = 1.49361 + 0.38105I$ $b = -0.866625 - 0.810195I$	$8.82733 + 0.53338I$	$4.24509 - 1.90410I$
$u = -0.557363 + 0.839839I$ $a = -1.49324 - 1.38719I$ $b = 0.257230 - 1.060260I$	$0.27509 - 5.53347I$	$-2.68605 + 8.82067I$
$u = -0.557363 - 0.839839I$ $a = -1.49324 + 1.38719I$ $b = 0.257230 + 1.060260I$	$0.27509 + 5.53347I$	$-2.68605 - 8.82067I$
$u = 0.191407 + 0.973334I$ $a = 0.61484 - 1.91027I$ $b = -0.761623 - 0.924314I$	$2.33477 + 5.75175I$	$-3.31343 - 6.58381I$
$u = 0.191407 - 0.973334I$ $a = 0.61484 + 1.91027I$ $b = -0.761623 + 0.924314I$	$2.33477 - 5.75175I$	$-3.31343 + 6.58381I$
$u = -0.650775 + 0.773636I$ $a = -0.562703 - 0.501035I$ $b = 0.694164 - 0.069962I$	$3.85863 - 2.42965I$	$4.20800 + 3.88872I$
$u = -0.650775 - 0.773636I$ $a = -0.562703 + 0.501035I$ $b = 0.694164 + 0.069962I$	$3.85863 + 2.42965I$	$4.20800 - 3.88872I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.621083 + 0.799921I$ $a = -2.68797 + 0.17282I$ $b = 0.714179 + 0.895252I$	$3.02078 + 5.11389I$	$0. - 6.57141I$
$u = 0.621083 - 0.799921I$ $a = -2.68797 - 0.17282I$ $b = 0.714179 - 0.895252I$	$3.02078 - 5.11389I$	$0. + 6.57141I$
$u = 0.641113 + 0.736885I$ $a = -1.05326 + 1.50993I$ $b = 0.727655 - 0.829091I$	$3.22659 - 0.38005I$	$1.076438 - 0.381418I$
$u = 0.641113 - 0.736885I$ $a = -1.05326 - 1.50993I$ $b = 0.727655 + 0.829091I$	$3.22659 + 0.38005I$	$1.076438 + 0.381418I$
$u = -0.784621 + 0.562056I$ $a = 1.34703 + 0.49250I$ $b = -0.805827 - 0.978477I$	$8.30451 + 5.68111I$	$3.40199 - 3.19190I$
$u = -0.784621 - 0.562056I$ $a = 1.34703 - 0.49250I$ $b = -0.805827 + 0.978477I$	$8.30451 - 5.68111I$	$3.40199 + 3.19190I$
$u = 0.419617 + 0.831418I$ $a = 1.92901 - 0.95806I$ $b = -0.048744 - 0.737006I$	$-1.20572 + 2.00199I$	$-7.02325 - 3.53170I$
$u = 0.419617 - 0.831418I$ $a = 1.92901 + 0.95806I$ $b = -0.048744 + 0.737006I$	$-1.20572 - 2.00199I$	$-7.02325 + 3.53170I$
$u = -0.584881 + 0.658903I$ $a = 0.148792 + 0.449303I$ $b = 0.354250 + 1.034950I$	$0.86366 + 1.17340I$	$0.879783 - 1.104139I$
$u = -0.584881 - 0.658903I$ $a = 0.148792 - 0.449303I$ $b = 0.354250 - 1.034950I$	$0.86366 - 1.17340I$	$0.879783 + 1.104139I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.598169+0.963503I$ $a=\ \ 2.16232+1.27766I$ $b=-0.779295+0.996450I$	$6.97066-10.76520I$	0
$u=-0.598169-0.963503I$ $a=\ \ 2.16232-1.27766I$ $b=-0.779295-0.996450I$	$6.97066+10.76520I$	0
$u=-0.627970+0.950567I$ $a=-0.095056+1.088790I$ $b=-0.853835-0.767019I$	$7.67631-4.67661I$	0
$u=-0.627970-0.950567I$ $a=-0.095056-1.088790I$ $b=-0.853835+0.767019I$	$7.67631+4.67661I$	0
$u=\ \ 0.071034+0.820875I$ $a=\ \ 0.48145+2.63173I$ $b=\ \ 0.134528+0.904687I$	$-2.92758+1.95595I$	$-11.89625-4.81261I$
$u=\ \ 0.071034-0.820875I$ $a=\ \ 0.48145-2.63173I$ $b=\ \ 0.134528-0.904687I$	$-2.92758-1.95595I$	$-11.89625+4.81261I$
$u=-0.864927+0.895250I$ $a=\ \ 0.697824+0.131404I$ $b=-0.302360-0.659717I$	$6.57199-1.97448I$	0
$u=-0.864927-0.895250I$ $a=\ \ 0.697824-0.131404I$ $b=-0.302360+0.659717I$	$6.57199+1.97448I$	0
$u=-0.851879+0.930952I$ $a=\ \ 1.53417+0.29283I$ $b=-0.284323+0.694959I$	$6.46068-4.39375I$	0
$u=-0.851879-0.930952I$ $a=\ \ 1.53417-0.29283I$ $b=-0.284323-0.694959I$	$6.46068+4.39375I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.910198 + 0.920175I$ $a = -0.1069100 - 0.0175219I$ $b = 0.318618 - 1.173080I$	$9.62869 - 0.79499I$	0
$u = 0.910198 - 0.920175I$ $a = -0.1069100 + 0.0175219I$ $b = 0.318618 + 1.173080I$	$9.62869 + 0.79499I$	0
$u = 0.325035 + 0.621241I$ $a = 0.691818 + 0.030726I$ $b = -0.045053 + 0.234286I$	$-0.201748 + 1.112070I$	$-3.30409 - 5.91204I$
$u = 0.325035 - 0.621241I$ $a = 0.691818 - 0.030726I$ $b = -0.045053 - 0.234286I$	$-0.201748 - 1.112070I$	$-3.30409 + 5.91204I$
$u = 0.942009 + 0.898668I$ $a = 1.31780 - 0.56148I$ $b = -0.811125 + 1.045670I$	$17.4170 - 7.1616I$	0
$u = 0.942009 - 0.898668I$ $a = 1.31780 + 0.56148I$ $b = -0.811125 - 1.045670I$	$17.4170 + 7.1616I$	0
$u = 0.895499 + 0.949477I$ $a = -1.43215 + 0.42653I$ $b = 0.303547 + 1.175220I$	$9.53363 + 7.45134I$	0
$u = 0.895499 - 0.949477I$ $a = -1.43215 - 0.42653I$ $b = 0.303547 - 1.175220I$	$9.53363 - 7.45134I$	0
$u = -0.914772 + 0.933791I$ $a = -1.32356 - 1.26003I$ $b = 0.823322 + 0.892050I$	$12.70460 - 0.29180I$	0
$u = -0.914772 - 0.933791I$ $a = -1.32356 + 1.26003I$ $b = 0.823322 - 0.892050I$	$12.70460 + 0.29180I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.690394 + 0.030120I$ $a = 1.39889 + 0.41674I$ $b = -0.809868 - 0.894099I$	$5.73169 + 3.03027I$	$4.19424 - 2.78424I$
$u = 0.690394 - 0.030120I$ $a = 1.39889 - 0.41674I$ $b = -0.809868 + 0.894099I$	$5.73169 - 3.03027I$	$4.19424 + 2.78424I$
$u = 0.942436 + 0.909290I$ $a = 1.57800 + 0.37798I$ $b = -0.942649 - 0.753265I$	$18.3412 - 0.7119I$	0
$u = 0.942436 - 0.909290I$ $a = 1.57800 - 0.37798I$ $b = -0.942649 + 0.753265I$	$18.3412 + 0.7119I$	0
$u = -0.908706 + 0.945270I$ $a = -2.36231 + 0.27916I$ $b = 0.818870 - 0.903943I$	$12.6670 - 6.4226I$	0
$u = -0.908706 - 0.945270I$ $a = -2.36231 - 0.27916I$ $b = 0.818870 + 0.903943I$	$12.6670 + 6.4226I$	0
$u = 0.914486 + 0.940989I$ $a = -1.045780 + 0.497688I$ $b = 0.892652 + 0.010539I$	$13.59950 + 3.36619I$	0
$u = 0.914486 - 0.940989I$ $a = -1.045780 - 0.497688I$ $b = 0.892652 - 0.010539I$	$13.59950 - 3.36619I$	0
$u = 0.895550 + 0.983231I$ $a = 2.40578 - 0.45339I$ $b = -0.803885 - 1.049880I$	$17.1389 + 13.9172I$	0
$u = 0.895550 - 0.983231I$ $a = 2.40578 + 0.45339I$ $b = -0.803885 + 1.049880I$	$17.1389 - 13.9172I$	0

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.903709 + 0.978699I$ $a = 0.66497 - 1.36041I$ $b = -0.941425 + 0.741601I$	$18.1123 + 7.4971I$	0
$u = 0.903709 - 0.978699I$ $a = 0.66497 + 1.36041I$ $b = -0.941425 - 0.741601I$	$18.1123 - 7.4971I$	0
$u = -0.138946 + 0.644931I$ $a = -2.02349 - 2.26505I$ $b = 0.559591 - 0.926866I$	$-0.64003 - 2.84760I$	$-8.08127 + 0.14345I$
$u = -0.138946 - 0.644931I$ $a = -2.02349 + 2.26505I$ $b = 0.559591 + 0.926866I$	$-0.64003 + 2.84760I$	$-8.08127 - 0.14345I$
$u = 0.344616 + 0.363333I$ $a = 0.547401 - 0.207447I$ $b = 0.251942 + 0.577672I$	$-0.068529 + 1.208380I$	$-0.22566 - 4.75539I$
$u = 0.344616 - 0.363333I$ $a = 0.547401 + 0.207447I$ $b = 0.251942 - 0.577672I$	$-0.068529 - 1.208380I$	$-0.22566 + 4.75539I$
$u = -0.172028 + 0.378457I$ $a = 0.94604 - 1.19928I$ $b = 0.483828 + 0.745563I$	$0.00258 + 1.44884I$	$-2.25105 - 5.51745I$
$u = -0.172028 - 0.378457I$ $a = 0.94604 + 1.19928I$ $b = 0.483828 - 0.745563I$	$0.00258 - 1.44884I$	$-2.25105 + 5.51745I$

II. $\boldsymbol{I^u_2 = \langle u^2a + u^2 + b,\ -u^2a - u^3 + a^2 + au + u^2 + a - u,\ u^4 - u^3 + u^2 + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= u^3a + 4u^2a + 2au + u^2 - a + 6u - 2$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5	$(y^2 + y + 1)^4$
c_3, c_7	y^8
c_6, c_{10}	$(y^4 + y^3 + 3y^2 + 2y + 1)^2$
c_8, c_9, c_{11} c_{12}	$(y^4 + 5y^3 + 7y^2 + 2y + 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.351808 + 0.720342I$ $a = 0.541116 + 0.214920I$ $b = 0.500000 + 0.866025I$	$-0.211005 + 0.614778I$	$-5.86133 + 2.84273I$
$u = -0.351808 + 0.720342I$ $a = -1.58443 - 1.44211I$ $b = 0.500000 - 0.866025I$	$-0.21101 - 3.44499I$	$-1.10064 + 8.92228I$
$u = -0.351808 - 0.720342I$ $a = 0.541116 - 0.214920I$ $b = 0.500000 - 0.866025I$	$-0.211005 - 0.614778I$	$-5.86133 - 2.84273I$
$u = -0.351808 - 0.720342I$ $a = -1.58443 + 1.44211I$ $b = 0.500000 + 0.866025I$	$-0.21101 + 3.44499I$	$-1.10064 - 8.92228I$
$u = 0.851808 + 0.911292I$ $a = -0.423047 + 0.283088I$ $b = 0.500000 - 0.866025I$	$6.79074 + 1.13408I$	$0.90087 + 2.75771I$
$u = 0.851808 + 0.911292I$ $a = -1.53364 + 0.35811I$ $b = 0.500000 + 0.866025I$	$6.79074 + 5.19385I$	$1.56110 - 7.61722I$
$u = 0.851808 - 0.911292I$ $a = -0.423047 - 0.283088I$ $b = 0.500000 + 0.866025I$	$6.79074 - 1.13408I$	$0.90087 - 2.75771I$
$u = 0.851808 - 0.911292I$ $a = -1.53364 - 0.35811I$ $b = 0.500000 - 0.866025I$	$6.79074 - 5.19385I$	$1.56110 + 7.61722I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_4	$((u^2-u+1)^4)(u^{58}+17u^{57}+\cdots+49u+1)$
c_2	$((u^2+u+1)^4)(u^{58}+5u^{57}+\cdots+u+1)$
c_3, c_7	$u^8(u^{58}-u^{57}+\cdots+384u+256)$
c_5	$((u^2-u+1)^4)(u^{58}+5u^{57}+\cdots+u+1)$
c_6	$((u^4-u^3+u^2+1)^2)(u^{58}-3u^{57}+\cdots-3u+1)$
c_8, c_9	$((u^4-u^3+3u^2-2u+1)^2)(u^{58}+11u^{57}+\cdots+21u+1)$
c_{10}	$((u^4+u^3+u^2+1)^2)(u^{58}-3u^{57}+\cdots-3u+1)$
c_{11}, c_{12}	$((u^4+u^3+3u^2+2u+1)^2)(u^{58}+11u^{57}+\cdots+21u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4	$((y^2+y+1)^4)(y^{58}+53y^{57}+\cdots-451y+1)$
c_2, c_5	$((y^2+y+1)^4)(y^{58}+17y^{57}+\cdots+49y+1)$
c_3, c_7	$y^8(y^{58}+45y^{57}+\cdots+475136y+65536)$
c_6, c_{10}	$((y^4+y^3+3y^2+2y+1)^2)(y^{58}+11y^{57}+\cdots+21y+1)$
c_8, c_9, c_{11} c_{12}	$((y^4+5y^3+7y^2+2y+1)^2)(y^{58}+75y^{57}+\cdots+45y+1)$