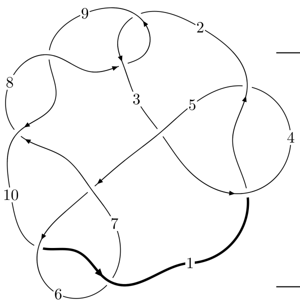
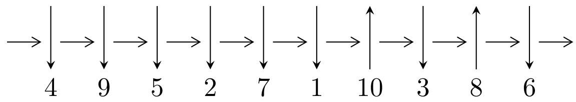
10_{78} $(K10a_{17})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$\begin{aligned}
I_1^u = \langle & -u^{11} - u^{10} + 2u^9 + 3u^8 - 2u^7 - 4u^6 - 2u^5 + u^4 + 2u^3 + u^2 + b - u - 1, \\
& - u^{11} - u^{10} + 2u^9 + 3u^8 - 2u^7 - 4u^6 - 2u^5 + u^4 + u^3 + u^2 + a - u - 1, \\
& u^{13} + u^{12} - 3u^{11} - 4u^{10} + 4u^9 + 7u^8 - 5u^6 - 3u^5 + 3u^3 + 2u^2 - 1\rangle \\
I_2^u = \langle & u^{20} - 6u^{18} + \cdots + b - 2u,\ 2u^{21} + u^{20} + \cdots + a + 1,\ u^{22} + u^{21} + \cdots - 4u^2 + 1\rangle \\
I_3^u = \langle & b + 1,\ a + 2,\ u + 1\rangle
\end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 36 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.

$$\boldsymbol{I_1^u = \langle -u^{11}-u^{10}+\cdots+b-1,\ -u^{11}-u^{10}+\cdots+a-1,\ u^{13}+u^{12}+\cdots+2u^2-1\rangle}$$

(i) Arc colorings

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

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

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

$$a_4 = \begin{pmatrix} u^{11}+u^{10}-2u^9-3u^8+2u^7+4u^6+2u^5-u^4-u^3-u^2+u+1 \\ u^{11}+u^{10}-2u^9-3u^8+2u^7+4u^6+2u^5-u^4-2u^3-u^2+u+1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} u^{12}+u^{11}-2u^{10}-3u^9+2u^8+4u^7+2u^6-u^5-u^4-u^3+u^2+u+1 \\ u^{12}+u^{11}-2u^{10}-3u^9+2u^8+4u^7+2u^6-u^5-2u^4-u^3+2u^2+u \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} u^3 \\ u^5-u^3+u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^{11}+u^{10}-2u^9-3u^8+2u^7+4u^6+u^5-u^4-u^3-u^2+u+1 \\ u^{11}+u^{10}-2u^9-3u^8+u^7+4u^6+3u^5-u^4-3u^3-u^2+u+1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^6-u^4+1 \\ u^6-2u^4+u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -2u^{11}+2u^{10}+8u^9-2u^8-16u^7+12u^5+10u^4-2u^3-2u^2-8u-4$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6 c_{10}	$u^{13} - u^{12} - 3u^{11} + 4u^{10} + 4u^9 - 7u^8 + 5u^6 - 3u^5 + 3u^3 - 2u^2 + 1$
c_2, c_8	$u^{13} + 3u^{12} + \cdots + 4u + 2$
c_3, c_5	$u^{13} + 7u^{12} + \cdots + 4u + 1$
c_7, c_9	$u^{13} - 3u^{12} + \cdots + 4u + 4$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_{10}	$y^{13} - 7y^{12} + \cdots + 4y - 1$
c_2, c_8	$y^{13} + 3y^{12} + \cdots + 4y - 4$
c_3, c_5	$y^{13} + y^{12} + \cdots + 8y - 1$
c_7, c_9	$y^{13} + 11y^{12} + \cdots + 104y - 16$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.915058 + 0.384331I$ $a = -0.86874 + 2.19716I$ $b = -1.22946 + 1.28849I$	$-2.16179 - 3.07776I$	$-9.60750 + 5.91774I$
$u = 0.915058 - 0.384331I$ $a = -0.86874 - 2.19716I$ $b = -1.22946 - 1.28849I$	$-2.16179 + 3.07776I$	$-9.60750 - 5.91774I$
$u = -0.992158 + 0.546170I$ $a = 1.43275 + 1.41238I$ $b = 1.52152 - 0.03761I$	$0.33005 + 7.56007I$	$-5.81453 - 9.02411I$
$u = -0.992158 - 0.546170I$ $a = 1.43275 - 1.41238I$ $b = 1.52152 + 0.03761I$	$0.33005 - 7.56007I$	$-5.81453 + 9.02411I$
$u = -0.613960 + 0.561299I$ $a = 0.334868 + 0.840411I$ $b = -0.013998 + 0.382511I$	$2.63797 + 1.38269I$	$-0.35464 - 3.62793I$
$u = -0.613960 - 0.561299I$ $a = 0.334868 - 0.840411I$ $b = -0.013998 - 0.382511I$	$2.63797 - 1.38269I$	$-0.35464 + 3.62793I$
$u = -0.089121 + 0.795435I$ $a = 0.065042 + 0.185799I$ $b = -0.103415 + 0.670130I$	$-1.44691 - 2.76421I$	$-4.50885 + 2.57748I$
$u = -0.089121 - 0.795435I$ $a = 0.065042 - 0.185799I$ $b = -0.103415 - 0.670130I$	$-1.44691 + 2.76421I$	$-4.50885 - 2.57748I$
$u = 1.216140 + 0.467752I$ $a = -2.46220 + 1.38514I$ $b = -3.46262 - 0.58793I$	$-8.78542 - 6.00980I$	$-11.90142 + 4.07839I$
$u = 1.216140 - 0.467752I$ $a = -2.46220 - 1.38514I$ $b = -3.46262 + 0.58793I$	$-8.78542 + 6.00980I$	$-11.90142 - 4.07839I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.231340 + 0.513532I$ $a = 2.38620 + 1.20321I$ $b = 3.27898 - 0.99721I$	$-8.1203 + 12.5021I$	$-10.75701 - 8.36275I$
$u = -1.231340 - 0.513532I$ $a = 2.38620 - 1.20321I$ $b = 3.27898 + 0.99721I$	$-8.1203 - 12.5021I$	$-10.75701 + 8.36275I$
$u = 0.590758$ $a = 1.22415$ $b = 1.01798$	-1.09585	-8.11210

II.

$$\boldsymbol{I_2^u = \langle u^{20} - 6u^{18} + \cdots + b - 2u,\ 2u^{21} + u^{20} + \cdots + a + 1,\ u^{22} + u^{21} + \cdots - 4u^2 + 1 \rangle}$$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -2u^{21} - u^{20} + \cdots + 4u - 1 \\ -u^{20} + 6u^{18} + \cdots + 2u^2 + 2u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -2u^{21} + 13u^{19} + \cdots + 4u - 1 \\ u^{19} - 5u^{17} + \cdots + 2u^2 + u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^3 \\ -u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^3 \\ u^5 - u^3 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -2u^{21} + 12u^{19} + \cdots + 3u - 1 \\ -u^{16} + 4u^{14} + \cdots + 2u^2 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^6 - u^4 + 1 \\ u^6 - 2u^4 + u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^{21} + 24u^{19} + 4u^{18} - 64u^{17} - 20u^{16} + 80u^{15} + 44u^{14} - 20u^{13} - 40u^{12} - 72u^{11} - 4u^{10} + 76u^9 + 40u^8 - 8u^7 - 20u^6 - 28u^5 - 4u^4 + 8u^3 + 8u^2 - 10$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_4, c_6 c_{10}	$u^{22} - u^{21} + \cdots - 4u^2 + 1$
c_2, c_8	$(u^{11} - u^{10} + 2u^9 - u^8 + 4u^7 - 2u^6 + 4u^5 - u^4 + 3u^3 + u^2 + 1)^2$
c_3, c_5	$u^{22} + 13u^{21} + \cdots + 8u + 1$
c_7, c_9	$(u^{11} - 3u^{10} + \cdots - 2u + 1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_{10}	$y^{22} - 13y^{21} + \cdots - 8y + 1$
c_2, c_8	$(y^{11} + 3y^{10} + \cdots - 2y - 1)^2$
c_3, c_5	$y^{22} - 9y^{21} + \cdots - 32y + 1$
c_7, c_9	$(y^{11} + 11y^{10} + \cdots + 6y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.878994+0.515981I$ $a=-0.407883+0.148860I$ $b=-0.509746-0.200169I$	$1.89175+2.94672I$	$-2.20063-4.11787I$
$u=-0.878994-0.515981I$ $a=-0.407883-0.148860I$ $b=-0.509746+0.200169I$	$1.89175-2.94672I$	$-2.20063+4.11787I$
$u=-0.894378+0.268842I$ $a=-2.19177-0.42458I$ $b=-0.632662+0.861406I$	$-2.98514+1.13130I$	$-7.98780-6.05785I$
$u=-0.894378-0.268842I$ $a=-2.19177+0.42458I$ $b=-0.632662-0.861406I$	$-2.98514-1.13130I$	$-7.98780+6.05785I$
$u=-0.101435+0.877274I$ $a=\ \ 1.073150-0.632994I$ $b=-2.13072-0.20221I$	$-4.72165-7.47524I$	$-7.77092+5.55460I$
$u=-0.101435-0.877274I$ $a=\ \ 1.073150+0.632994I$ $b=-2.13072+0.20221I$	$-4.72165+7.47524I$	$-7.77092-5.55460I$
$u=\ \ 1.166330+0.116345I$ $a=\ \ 1.74332-0.35353I$ $b=\ \ 1.54944+0.26584I$	$-2.98514+1.13130I$	$-7.98780-6.05785I$
$u=\ \ 1.166330-0.116345I$ $a=\ \ 1.74332+0.35353I$ $b=\ \ 1.54944-0.26584I$	$-2.98514-1.13130I$	$-7.98780+6.05785I$
$u=\ \ 0.022883+0.808487I$ $a=-1.17422-0.82028I$ $b=\ \ 2.00647+0.07669I$	$-5.26692+1.41699I$	$-8.79131-0.63373I$
$u=\ \ 0.022883-0.808487I$ $a=-1.17422+0.82028I$ $b=\ \ 2.00647-0.07669I$	$-5.26692-1.41699I$	$-8.79131+0.63373I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.438226 + 0.645537I$ $a = 0.159128 - 0.544432I$ $b = -1.222780 - 0.483692I$	$1.89175 - 2.94672I$	$-2.20063 + 4.11787I$
$u = -0.438226 - 0.645537I$ $a = 0.159128 + 0.544432I$ $b = -1.222780 + 0.483692I$	$1.89175 + 2.94672I$	$-2.20063 - 4.11787I$
$u = 1.209200 + 0.415611I$ $a = 0.716733 + 0.554276I$ $b = 0.389956 + 0.626620I$	$-5.26692 - 1.41699I$	$-8.79131 + 0.63373I$
$u = 1.209200 - 0.415611I$ $a = 0.716733 - 0.554276I$ $b = 0.389956 - 0.626620I$	$-5.26692 + 1.41699I$	$-8.79131 - 0.63373I$
$u = -1.218830 + 0.447288I$ $a = -1.98611 - 0.66727I$ $b = -2.01763 + 1.70968I$	$-8.93247 + 3.04152I$	$-12.06121 - 2.82242I$
$u = -1.218830 - 0.447288I$ $a = -1.98611 + 0.66727I$ $b = -2.01763 - 1.70968I$	$-8.93247 - 3.04152I$	$-12.06121 + 2.82242I$
$u = -1.203210 + 0.491862I$ $a = -0.610676 + 0.586169I$ $b = -0.143972 + 0.552324I$	$-4.72165 + 7.47524I$	$-7.77092 - 5.55460I$
$u = -1.203210 - 0.491862I$ $a = -0.610676 - 0.586169I$ $b = -0.143972 - 0.552324I$	$-4.72165 - 7.47524I$	$-7.77092 + 5.55460I$
$u = 0.687015$ $a = 0.995334$ $b = 0.930026$	-1.09450	-8.37630
$u = 1.263030 + 0.401917I$ $a = 1.93778 - 0.67607I$ $b = 2.24577 + 1.44537I$	$-8.93247 + 3.04152I$	$-12.06121 - 2.82242I$

	Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u =$	$1.263030 - 0.401917I$		
$a =$	$1.93778 + 0.67607I$	$-8.93247 - 3.04152I$	$-12.06121 + 2.82242I$
$b =$	$2.24577 - 1.44537I$		
$u =$	0.460239		
$a =$	1.48577	-1.09450	-8.37630
$b =$	1.00173		

III. $I_3^u = \langle b+1,\ a+2,\ u+1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = -2.00000$ $b = -1.00000$	-3.28987	-12.0000

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_6	$(u-1)(u^{13}-u^{12}+\cdots-2u^2+1)$ $\cdot(u^{22}-u^{21}+\cdots-4u^2+1)$
c_2, c_8	$u(u^{11}-u^{10}+2u^9-u^8+4u^7-2u^6+4u^5-u^4+3u^3+u^2+1)^2$ $\cdot(u^{13}+3u^{12}+\cdots+4u+2)$
c_3, c_5	$(u-1)(u^{13}+7u^{12}+\cdots+4u+1)(u^{22}+13u^{21}+\cdots+8u+1)$
c_4, c_{10}	$(u+1)(u^{13}-u^{12}+\cdots-2u^2+1)$ $\cdot(u^{22}-u^{21}+\cdots-4u^2+1)$
c_7, c_9	$u(u^{11}-3u^{10}+\cdots-2u+1)^2(u^{13}-3u^{12}+\cdots+4u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_4, c_6 c_{10}	$(y-1)(y^{13}-7y^{12}+\cdots+4y-1)(y^{22}-13y^{21}+\cdots-8y+1)$
c_2, c_8	$y(y^{11}+3y^{10}+\cdots-2y-1)^2(y^{13}+3y^{12}+\cdots+4y-4)$
c_3, c_5	$(y-1)(y^{13}+y^{12}+\cdots+8y-1)(y^{22}-9y^{21}+\cdots-32y+1)$
c_7, c_9	$y(y^{11}+11y^{10}+\cdots+6y-1)^2(y^{13}+11y^{12}+\cdots+104y-16)$