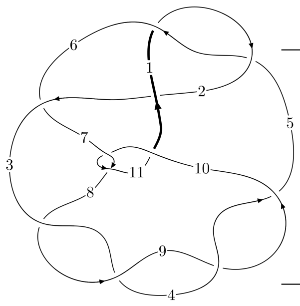
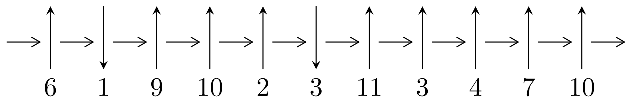
$11n_{89}$ ($K11n_{89}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I^u_1 = \langle 1.81408 \times 10^{16}u^{35} + 4.53180 \times 10^{15}u^{34} + \cdots + 1.44921 \times 10^{16}b + 6.92452 \times 10^{16},$$
$$- 7.36698 \times 10^{15}u^{35} - 2.71053 \times 10^{15}u^{34} + \cdots + 1.44921 \times 10^{16}a - 3.17098 \times 10^{16},\ u^{36} - u^{35} + \cdots + 12u -$$
$$I^u_2 = \langle b^2 + 2bu - b - u + 3,\ 2a - u,\ u^2 - 2\rangle$$

$$I^v_1 = \langle a,\ b + v - 1,\ v^2 - v + 1\rangle$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 42 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.
$\boldsymbol{I_1^u = \langle 1.81\times10^{16}u^{35}+4.53\times10^{15}u^{34}+\cdots+1.45\times10^{16}b+6.92\times10^{16},\ -7.37\times10^{15}u^{35}-2.71\times10^{15}u^{34}+\cdots+1.45\times10^{16}a-3.17\times10^{16},\ u^{36}-u^{35}+\cdots+12u-4\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_5 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_7 = \begin{pmatrix}0.508345u^{35}+0.187035u^{34}+\cdots-3.81933u+2.18808\\-1.25177u^{35}-0.312708u^{34}+\cdots+10.6982u-4.77814\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0.995471u^{35}+0.0679041u^{34}+\cdots-10.1216u+3.89180\\-0.252045u^{35}+0.0577695u^{34}+\cdots+3.24270u-1.30174\end{pmatrix}$$
$$a_1 = \begin{pmatrix}0.995471u^{35}+0.0679041u^{34}+\cdots-10.1216u+3.89180\\-1.49385u^{35}-0.192804u^{34}+\cdots+12.0213u-5.55524\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u\\u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^2+1\\u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1.29114u^{35}+0.157626u^{34}+\cdots-12.6782u+5.68748\\-1.28270u^{35}-0.365443u^{34}+\cdots+10.3098u-3.90050\end{pmatrix}$$
$$a_6 = \begin{pmatrix}0.498382u^{35}+0.124900u^{34}+\cdots-1.89976u+1.66344\\-1.49385u^{35}-0.192804u^{34}+\cdots+12.0213u-5.55524\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^3-2u\\-u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}u^3-2u\\-u^3+u\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= -\frac{2185176855038490}{3623024810197363}u^{35} - \frac{2137823921618481}{3623024810197363}u^{34} + \cdots - \frac{32140848155027584}{3623024810197363}u + \frac{31012404119150980}{3623024810197363}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{36} - 2u^{35} + \cdots - 6u + 1$
c_2	$u^{36} + 20u^{35} + \cdots - 6u + 1$
c_3, c_4, c_8 c_9	$u^{36} - u^{35} + \cdots + 12u - 4$
c_6	$u^{36} + 2u^{35} + \cdots + 6u + 13$
c_7, c_{10}	$u^{36} - 3u^{35} + \cdots + 13u - 7$
c_{11}	$u^{36} - 13u^{35} + \cdots - 687u + 49$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{36} + 20y^{35} + \cdots - 6y + 1$
c_2	$y^{36} - 4y^{35} + \cdots - 142y + 1$
c_3, c_4, c_8 c_9	$y^{36} - 31y^{35} + \cdots + 80y + 16$
c_6	$y^{36} - 28y^{35} + \cdots - 3962y + 169$
c_7, c_{10}	$y^{36} - 13y^{35} + \cdots - 687y + 49$
c_{11}	$y^{36} + 27y^{35} + \cdots - 44983y + 2401$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.194833 + 0.923873I$ $a = -1.10823 - 0.89470I$ $b = 1.34994 + 0.54291I$	$-6.59180 - 8.00171I$	$4.29537 + 5.98015I$
$u = -0.194833 - 0.923873I$ $a = -1.10823 + 0.89470I$ $b = 1.34994 - 0.54291I$	$-6.59180 + 8.00171I$	$4.29537 - 5.98015I$
$u = 0.006560 + 0.931824I$ $a = -1.025890 - 0.856109I$ $b = 1.239880 + 0.450718I$	$-7.38383 + 1.35991I$	$2.81294 - 0.73046I$
$u = 0.006560 - 0.931824I$ $a = -1.025890 + 0.856109I$ $b = 1.239880 - 0.450718I$	$-7.38383 - 1.35991I$	$2.81294 + 0.73046I$
$u = 0.109745 + 0.850278I$ $a = 1.058100 - 0.923490I$ $b = -1.266800 + 0.563919I$	$-3.22625 + 3.00094I$	$6.75961 - 2.89336I$
$u = 0.109745 - 0.850278I$ $a = 1.058100 + 0.923490I$ $b = -1.266800 - 0.563919I$	$-3.22625 - 3.00094I$	$6.75961 + 2.89336I$
$u = 1.160570 + 0.158096I$ $a = 1.122800 - 0.199847I$ $b = -1.61805 + 0.12059I$	$3.84173 + 3.51209I$	$9.42797 - 4.38206I$
$u = 1.160570 - 0.158096I$ $a = 1.122800 + 0.199847I$ $b = -1.61805 - 0.12059I$	$3.84173 - 3.51209I$	$9.42797 + 4.38206I$
$u = -1.077610 + 0.525072I$ $a = 0.298720 + 0.977705I$ $b = 0.481253 + 0.080718I$	$-3.88454 + 2.88072I$	$5.75517 - 2.19113I$
$u = -1.077610 - 0.525072I$ $a = 0.298720 - 0.977705I$ $b = 0.481253 - 0.080718I$	$-3.88454 - 2.88072I$	$5.75517 + 2.19113I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.202650 + 0.097073I$ $a = -0.646364 - 0.353578I$ $b = -0.21399 - 1.65792I$	$4.33907 - 0.62358I$	$10.41420 - 0.63892I$
$u = 1.202650 - 0.097073I$ $a = -0.646364 + 0.353578I$ $b = -0.21399 + 1.65792I$	$4.33907 + 0.62358I$	$10.41420 + 0.63892I$
$u = 1.182650 + 0.387668I$ $a = -0.269222 + 0.813754I$ $b = -0.610573 + 0.189166I$	$0.05037 + 1.45720I$	$9.46667 - 0.65893I$
$u = 1.182650 - 0.387668I$ $a = -0.269222 - 0.813754I$ $b = -0.610573 - 0.189166I$	$0.05037 - 1.45720I$	$9.46667 + 0.65893I$
$u = -1.236460 + 0.192085I$ $a = 0.735931 - 0.323447I$ $b = -0.46964 - 1.88597I$	$4.64327 - 4.73682I$	$11.38513 + 6.59168I$
$u = -1.236460 - 0.192085I$ $a = 0.735931 + 0.323447I$ $b = -0.46964 + 1.88597I$	$4.64327 + 4.73682I$	$11.38513 - 6.59168I$
$u = -0.577288 + 0.463180I$ $a = 0.811817 - 0.556107I$ $b = -0.692193 - 0.136688I$	$-2.03068 - 1.81473I$	$2.83557 + 4.64572I$
$u = -0.577288 - 0.463180I$ $a = 0.811817 + 0.556107I$ $b = -0.692193 + 0.136688I$	$-2.03068 + 1.81473I$	$2.83557 - 4.64572I$
$u = -1.31774$ $a = -0.894179$ $b = 1.49912$	6.40417	14.3790
$u = 1.280170 + 0.461183I$ $a = -0.895029 - 0.349023I$ $b = 1.40509 - 1.14928I$	$-3.43518 + 3.60339I$	$6.07450 - 2.50762I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.280170 - 0.461183I$ $a = -0.895029 + 0.349023I$ $b = 1.40509 + 1.14928I$	$-3.43518 - 3.60339I$	$6.07450 + 2.50762I$
$u = -1.290060 + 0.452109I$ $a = 0.147894 + 0.839120I$ $b = 0.685533 + 0.078345I$	$-3.35690 - 6.29314I$	$6.15059 + 3.94061I$
$u = -1.290060 - 0.452109I$ $a = 0.147894 - 0.839120I$ $b = 0.685533 - 0.078345I$	$-3.35690 + 6.29314I$	$6.15059 - 3.94061I$
$u = -1.355620 + 0.380756I$ $a = 0.878387 - 0.297489I$ $b = -1.57977 - 1.46639I$	$1.38910 - 7.43800I$	$11.20734 + 4.77385I$
$u = -1.355620 - 0.380756I$ $a = 0.878387 + 0.297489I$ $b = -1.57977 + 1.46639I$	$1.38910 + 7.43800I$	$11.20734 - 4.77385I$
$u = -1.43819 + 0.07165I$ $a = -0.701955 - 0.180604I$ $b = 1.401880 + 0.072692I$	$6.55786 - 0.26724I$	$12.41884 - 1.59842I$
$u = -1.43819 - 0.07165I$ $a = -0.701955 + 0.180604I$ $b = 1.401880 - 0.072692I$	$6.55786 + 0.26724I$	$12.41884 + 1.59842I$
$u = 1.41123 + 0.40473I$ $a = -0.905027 - 0.281003I$ $b = 1.79130 - 1.37903I$	$-1.51226 + 12.78080I$	$7.00000 - 7.80857I$
$u = 1.41123 - 0.40473I$ $a = -0.905027 + 0.281003I$ $b = 1.79130 + 1.37903I$	$-1.51226 - 12.78080I$	$7.00000 + 7.80857I$
$u = 1.50740 + 0.00063I$ $a = 0.404596 + 0.237890I$ $b = -1.296770 - 0.039394I$	$5.02009 + 2.85591I$	$7.00000 - 5.56949I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.50740 - 0.00063I$ $a = 0.404596 - 0.237890I$ $b = -1.296770 + 0.039394I$	$5.02009 - 2.85591I$	$7.00000 + 5.56949I$
$u = 0.226004 + 0.427139I$ $a = -0.81515 + 2.22304I$ $b = -0.0399825 - 0.0159679I$	$1.14397 - 1.32004I$	$4.86119 - 2.11551I$
$u = 0.226004 - 0.427139I$ $a = -0.81515 - 2.22304I$ $b = -0.0399825 + 0.0159679I$	$1.14397 + 1.32004I$	$4.86119 + 2.11551I$
$u = 0.452153$ $a = -1.04552$ $b = 0.187974$	0.718633	13.9020
$u = 0.015889 + 0.435860I$ $a = 0.37848 - 1.46882I$ $b = -0.410669 + 1.206820I$	$0.87457 + 2.36441I$	$2.54968 - 4.98912I$
$u = 0.015889 - 0.435860I$ $a = 0.37848 + 1.46882I$ $b = -0.410669 - 1.206820I$	$0.87457 - 2.36441I$	$2.54968 + 4.98912I$

II. $I_2^u = \langle b^2 + 2bu - b - u + 3,\ 2a - u,\ u^2 - 2\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 4b + 4u + 12$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.41421$ $a = 0.707107$ $b = -0.914214 + 0.866025I$	$6.57974 - 2.02988I$	$14.0000 + 3.4641I$
$u = 1.41421$ $a = 0.707107$ $b = -0.914214 - 0.866025I$	$6.57974 + 2.02988I$	$14.0000 - 3.4641I$
$u = -1.41421$ $a = -0.707107$ $b = 1.91421 + 0.86603I$	$6.57974 - 2.02988I$	$14.0000 + 3.4641I$
$u = -1.41421$ $a = -0.707107$ $b = 1.91421 - 0.86603I$	$6.57974 + 2.02988I$	$14.0000 - 3.4641I$

III. $I^v_1 = \langle a,\ b + v - 1,\ v^2 - v + 1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4v + 14$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

	Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$v=$	$0.500000+0.866025I$		
$a=$	0	$1.64493+2.02988I$	$12.00000-3.46410I$
$b=$	$0.500000-0.866025I$		
$v=$	$0.500000-0.866025I$		
$a=$	0	$1.64493-2.02988I$	$12.00000+3.46410I$
$b=$	$0.500000+0.866025I$		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u^2-u+1)^2)(u^2+u+1)(u^{36}-2u^{35}+\cdots-6u+1)$
c_2	$((u^2+u+1)^3)(u^{36}+20u^{35}+\cdots-6u+1)$
c_3, c_4, c_8 c_9	$u^2(u^2-2)^2(u^{36}-u^{35}+\cdots+12u-4)$
c_5	$(u^2-u+1)(u^2+u+1)^2(u^{36}-2u^{35}+\cdots-6u+1)$
c_6	$((u^2-u+1)^2)(u^2+u+1)(u^{36}+2u^{35}+\cdots+6u+13)$
c_7	$((u-1)^4)(u+1)^2(u^{36}-3u^{35}+\cdots+13u-7)$
c_{10}	$((u-1)^2)(u+1)^4(u^{36}-3u^{35}+\cdots+13u-7)$
c_{11}	$((u-1)^6)(u^{36}-13u^{35}+\cdots-687u+49)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$((y^2+y+1)^3)(y^{36}+20y^{35}+\cdots-6y+1)$
c_2	$((y^2+y+1)^3)(y^{36}-4y^{35}+\cdots-142y+1)$
c_3, c_4, c_8 c_9	$y^2(y-2)^4(y^{36}-31y^{35}+\cdots+80y+16)$
c_6	$((y^2+y+1)^3)(y^{36}-28y^{35}+\cdots-3962y+169)$
c_7, c_{10}	$((y-1)^6)(y^{36}-13y^{35}+\cdots-687y+49)$
c_{11}	$((y-1)^6)(y^{36}+27y^{35}+\cdots-44983y+2401)$