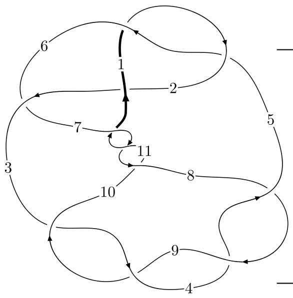
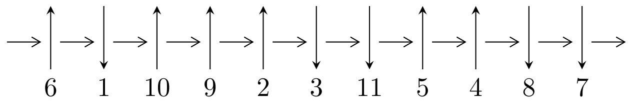
# $11a_{98}$ $(K11a_{98})$



A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$I_1^u = \langle u^{38} - u^{37} + \cdots - u + 1 \rangle$$

* 1 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 38 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. $I_1^u = \langle u^{38} - u^{37} + \cdots - u + 1 \rangle$

**(i) Arc colorings**

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^4 + 3u^2 + 1 \\ -u^4 - 2u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^3 - 2u \\ u^5 + 3u^3 + u \end{pmatrix}$$
$$a_7 = \begin{pmatrix} u^8 + 5u^6 + 7u^4 + 2u^2 + 1 \\ -u^8 - 4u^6 - 4u^4 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^{12} + 7u^{10} + 17u^8 + 16u^6 + 6u^4 + 5u^2 + 1 \\ -u^{12} - 6u^{10} - 12u^8 - 8u^6 - u^4 - 2u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^{29} + 16u^{27} + \cdots + 8u^3 - u \\ -u^{29} - 15u^{27} + \cdots + u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^{16} + 9u^{14} + 31u^{12} + 50u^{10} + 39u^8 + 22u^6 + 18u^4 + 4u^2 + 1 \\ -u^{18} - 10u^{16} - 39u^{14} - 74u^{12} - 71u^{10} - 40u^8 - 26u^6 - 12u^4 - u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u^{16} + 9u^{14} + 31u^{12} + 50u^{10} + 39u^8 + 22u^6 + 18u^4 + 4u^2 + 1 \\ -u^{18} - 10u^{16} - 39u^{14} - 74u^{12} - 71u^{10} - 40u^8 - 26u^6 - 12u^4 - u^2 \end{pmatrix}$$

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes**
$= -4u^{37}+4u^{36}-84u^{35}+76u^{34}-788u^{33}+640u^{32}-4348u^{31}+3136u^{30}-15652u^{29}+9876u^{28}-38648u^{27}+20892u^{26}-67496u^{25}+30388u^{24}-86252u^{23}+31308u^{22}-85720u^{21}+24576u^{20}-72004u^{19}+16236u^{18}-52428u^{17}+8440u^{16}-31340u^{15}+2244u^{14}-15844u^{13}-364u^{12}-7264u^{11}-736u^{10}-2476u^9-656u^8-756u^7-360u^6-144u^5-84u^4-52u^3-12u^2-12u+2$

**(iv) u-Polynomials at the component**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{38} - u^{37} + \cdots - u + 1$ |
| $c_2$ | $u^{38} + 17u^{37} + \cdots + 3u + 1$ |
| $c_3, c_4, c_8$<br>$c_9$ | $u^{38} - u^{37} + \cdots - u + 1$ |
| $c_6$ | $u^{38} + u^{37} + \cdots + u + 1$ |
| $c_7, c_{10}, c_{11}$ | $u^{38} - 5u^{37} + \cdots - 25u + 3$ |

**(v) Riley Polynomials at the component**

| Crossings | Riley Polynomials at each crossing |
| --- | --- |
| $c_1, c_5$ | $y^{38} + 17y^{37} + \cdots + 3y + 1$ |
| $c_2$ | $y^{38} + 9y^{37} + \cdots + 19y + 1$ |
| $c_3, c_4, c_8$<br>$c_9$ | $y^{38} + 41y^{37} + \cdots + 3y + 1$ |
| $c_6$ | $y^{38} + y^{37} + \cdots + 35y + 1$ |
| $c_7, c_{10}, c_{11}$ | $y^{38} + 37y^{37} + \cdots + 59y + 9$ |

**(vi) Complex Volumes and Cusp Shapes**

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = 0.635381 + 0.544778I$ | $4.89318 + 8.99255I$ | $2.54683 - 8.05726I$ |
| $u = 0.635381 - 0.544778I$ | $4.89318 - 8.99255I$ | $2.54683 + 8.05726I$ |
| $u = -0.637190 + 0.525254I$ | $6.72503 - 3.70347I$ | $5.40296 + 3.46584I$ |
| $u = -0.637190 - 0.525254I$ | $6.72503 + 3.70347I$ | $5.40296 - 3.46584I$ |
| $u = -0.646186 + 0.476105I$ | $6.87083 - 0.63435I$ | $5.86902 + 2.86167I$ |
| $u = -0.646186 - 0.476105I$ | $6.87083 + 0.63435I$ | $5.86902 - 2.86167I$ |
| $u = 0.651941 + 0.454511I$ | $5.16060 - 4.64389I$ | $3.40172 + 1.99685I$ |
| $u = 0.651941 - 0.454511I$ | $5.16060 + 4.64389I$ | $3.40172 - 1.99685I$ |
| $u = 0.587799 + 0.498634I$ | $1.34506 + 2.00929I$ | $-0.48209 - 3.49556I$ |
| $u = 0.587799 - 0.498634I$ | $1.34506 - 2.00929I$ | $-0.48209 + 3.49556I$ |
| $u = -0.330816 + 0.636061I$ | $-2.01726 - 5.47617I$ | $-3.09870 + 9.17486I$ |
| $u = -0.330816 - 0.636061I$ | $-2.01726 + 5.47617I$ | $-3.09870 - 9.17486I$ |
| $u = -0.144727 + 0.660329I$ | $-3.03329 + 1.00909I$ | $-7.12564 + 0.28235I$ |
| $u = -0.144727 - 0.660329I$ | $-3.03329 - 1.00909I$ | $-7.12564 - 0.28235I$ |
| $u = 0.301795 + 0.520951I$ | $-0.018847 + 1.384110I$ | $1.16696 - 5.74622I$ |
| $u = 0.301795 - 0.520951I$ | $-0.018847 - 1.384110I$ | $1.16696 + 5.74622I$ |
| $u = 0.03046 + 1.45212I$ | $-4.91125 + 2.21769I$ | $0$ |
| $u = 0.03046 - 1.45212I$ | $-4.91125 - 2.21769I$ | $0$ |
| $u = 0.19314 + 1.48235I$ | $-1.12742 - 1.62626I$ | $0$ |
| $u = 0.19314 - 1.48235I$ | $-1.12742 + 1.62626I$ | $0$ |
| $u = -0.19488 + 1.49761I$ | $0.43075 - 3.64794I$ | $0$ |
| $u = -0.19488 - 1.49761I$ | $0.43075 + 3.64794I$ | $0$ |
| $u = 0.379571 + 0.296373I$ | $0.630271 + 1.053360I$ | $5.17597 - 5.21367I$ |
| $u = 0.379571 - 0.296373I$ | $0.630271 - 1.053360I$ | $5.17597 + 5.21367I$ |
| $u = 0.17234 + 1.52286I$ | $-5.33654 + 4.72378I$ | $0$ |
| $u = 0.17234 - 1.52286I$ | $-5.33654 - 4.72378I$ | $0$ |
| $u = -0.448691 + 0.124937I$ | $-0.48331 + 2.76150I$ | $3.31371 - 3.04166I$ |
| $u = -0.448691 - 0.124937I$ | $-0.48331 - 2.76150I$ | $3.31371 + 3.04166I$ |
| $u = 0.06806 + 1.53625I$ | $-6.95274 + 2.61432I$ | $0$ |
| $u = 0.06806 - 1.53625I$ | $-6.95274 - 2.61432I$ | $0$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.19702 + 1.52628I$ | $-0.02756 - 6.72233I$ | 0 |
| $u = -0.19702 - 1.52628I$ | $-0.02756 + 6.72233I$ | 0 |
| $u = \quad 0.19796 + 1.53605I$ | $-1.97382 + 12.02170I$ | 0 |
| $u = \quad 0.19796 - 1.53605I$ | $-1.97382 - 12.02170I$ | 0 |
| $u = -0.03796 + 1.56118I$ | $-10.49980 + 0.35836I$ | 0 |
| $u = -0.03796 - 1.56118I$ | $-10.49980 - 0.35836I$ | 0 |
| $u = -0.08099 + 1.56107I$ | $-9.41307 - 6.91152I$ | 0 |
| $u = -0.08099 - 1.56107I$ | $-9.41307 + 6.91152I$ | 0 |

**II. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{38} - u^{37} + \cdots - u + 1$ |
| $c_2$ | $u^{38} + 17u^{37} + \cdots + 3u + 1$ |
| $c_3, c_4, c_8$<br>$c_9$ | $u^{38} - u^{37} + \cdots - u + 1$ |
| $c_6$ | $u^{38} + u^{37} + \cdots + u + 1$ |
| $c_7, c_{10}, c_{11}$ | $u^{38} - 5u^{37} + \cdots - 25u + 3$ |

## III. Riley Polynomials

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y^{38} + 17y^{37} + \cdots + 3y + 1$ |
| $c_2$ | $y^{38} + 9y^{37} + \cdots + 19y + 1$ |
| $c_3, c_4, c_8$<br>$c_9$ | $y^{38} + 41y^{37} + \cdots + 3y + 1$ |
| $c_6$ | $y^{38} + y^{37} + \cdots + 35y + 1$ |
| $c_7, c_{10}, c_{11}$ | $y^{38} + 37y^{37} + \cdots + 59y + 9$ |