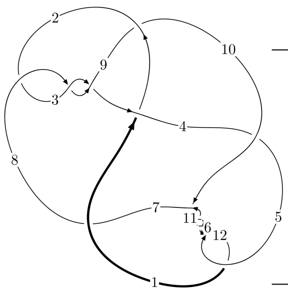
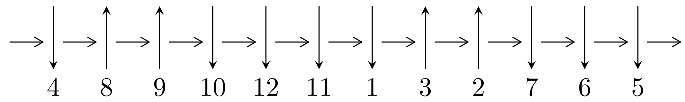
# $12a_{1140}$ ($K12a_{1140}$)




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

$$4,9 \underset{c_3}{\rightarrow} 3 \underset{c_8}{\rightarrow} 8 \underset{c_2}{\rightarrow} 2 \underset{c_9}{\rightarrow} 10 \underset{c_4}{\rightarrow} 5 \underset{c_1}{\rightarrow} 1 \underset{c_7}{\rightarrow} 7 \underset{c_{10}}{\rightarrow} 11 \underset{c_6}{\rightarrow} 6 \underset{c_{12}}{\rightarrow} 12 \rightsquigarrow c_5, c_{11}$$

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

$$I_1^u = \langle u^{48} + u^{47} + \cdots + 2u^2 + 1 \rangle$$

* 1 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 48 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. $I^u_1 = \langle u^{48} + u^{47} + \cdots + 2u^2 + 1\rangle$

**(i) Arc colorings**

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^5 - 2u^3 + u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^{12} - 5u^{10} + 9u^8 - 6u^6 + u^2 + 1 \\ u^{14} - 6u^{12} + 13u^{10} - 10u^8 - 2u^6 + 4u^4 + u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^4 + u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^{11} + 4u^9 - 4u^7 - 2u^5 + 3u^3 \\ -u^{11} + 5u^9 - 8u^7 + 3u^5 + u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^{29} + 12u^{27} + \cdots - 2u^3 + u \\ -u^{29} + 13u^{27} + \cdots + 3u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^{47} + 20u^{45} + \cdots - 8u^5 + 4u^3 \\ -u^{47} + 21u^{45} + \cdots + 2u^3 + u \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u^{30} - 13u^{28} + \cdots + 2u^2 + 1 \\ u^{32} - 14u^{30} + \cdots - 20u^8 + 2u^2 \end{pmatrix}$$

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

**(iii) Cusp Shapes** $= -4u^{45} + 80u^{43} + \cdots + 8u - 6$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{48} - 11u^{47} + \cdots - 336u + 41$ |
| $c_2, c_3, c_8$ | $u^{48} - u^{47} + \cdots + 2u^2 + 1$ |
| $c_4, c_7$ | $u^{48} + u^{47} + \cdots + 150u + 61$ |
| $c_5, c_6, c_{10}$<br>$c_{11}, c_{12}$ | $u^{48} + u^{47} + \cdots + 2u + 1$ |
| $c_9$ | $u^{48} + 3u^{47} + \cdots + 4u + 1$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{48} + 9y^{47} + \cdots + 21912y + 1681$ |
| $c_2, c_3, c_8$ | $y^{48} - 43y^{47} + \cdots + 4y + 1$ |
| $c_4, c_7$ | $y^{48} - 27y^{47} + \cdots + 17760y + 3721$ |
| $c_5, c_6, c_{10}$<br>$c_{11}, c_{12}$ | $y^{48} + 61y^{47} + \cdots + 4y + 1$ |
| $c_9$ | $y^{48} + y^{47} + \cdots - 36y^2 + 1$ |

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

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.984705 + 0.170190I$ | $0.63620 - 3.07400I$ | $-1.42622 + 5.04336I$ |
| $u = -0.984705 - 0.170190I$ | $0.63620 + 3.07400I$ | $-1.42622 - 5.04336I$ |
| $u = \phantom{-}1.034970 + 0.229830I$ | $9.29821 + 4.64078I$ | $0.19063 - 3.74391I$ |
| $u = \phantom{-}1.034970 - 0.229830I$ | $9.29821 - 4.64078I$ | $0.19063 + 3.74391I$ |
| $u = \phantom{-}0.821678 + 0.119203I$ | $-1.80692 - 0.00993I$ | $-6.31095 - 0.29160I$ |
| $u = \phantom{-}0.821678 - 0.119203I$ | $-1.80692 + 0.00993I$ | $-6.31095 + 0.29160I$ |
| $u = \phantom{-}0.697074 + 0.345244I$ | $9.79430 - 4.58712I$ | $1.41766 + 1.42537I$ |
| $u = \phantom{-}0.697074 - 0.345244I$ | $9.79430 + 4.58712I$ | $1.41766 - 1.42537I$ |
| $u = \phantom{-}0.276656 + 0.724689I$ | $8.24979 + 8.49657I$ | $-1.26312 - 6.40308I$ |
| $u = \phantom{-}0.276656 - 0.724689I$ | $8.24979 - 8.49657I$ | $-1.26312 + 6.40308I$ |
| $u = -0.258333 + 0.712893I$ | $-0.80898 - 6.73195I$ | $-3.03818 + 8.02768I$ |
| $u = -0.258333 - 0.712893I$ | $-0.80898 + 6.73195I$ | $-3.03818 - 8.02768I$ |
| $u = -0.696113 + 0.263546I$ | $0.85094 + 3.00932I$ | $-0.10546 - 3.28969I$ |
| $u = -0.696113 - 0.263546I$ | $0.85094 - 3.00932I$ | $-0.10546 + 3.28969I$ |
| $u = \phantom{-}0.229854 + 0.703043I$ | $-3.75638 + 3.54065I$ | $-8.92526 - 5.06196I$ |
| $u = \phantom{-}0.229854 - 0.703043I$ | $-3.75638 - 3.54065I$ | $-8.92526 + 5.06196I$ |
| $u = \phantom{-}0.146777 + 0.708759I$ | $6.63287 - 1.05371I$ | $-3.70281 - 0.77988I$ |
| $u = \phantom{-}0.146777 - 0.708759I$ | $6.63287 + 1.05371I$ | $-3.70281 + 0.77988I$ |
| $u = -0.190207 + 0.689875I$ | $-1.71125 - 0.36118I$ | $-5.08602 - 0.20285I$ |
| $u = -0.190207 - 0.689875I$ | $-1.71125 + 0.36118I$ | $-5.08602 + 0.20285I$ |
| $u = -0.401505 + 0.556155I$ | $13.18090 - 1.81273I$ | $3.22900 + 3.77442I$ |
| $u = -0.401505 - 0.556155I$ | $13.18090 + 1.81273I$ | $3.22900 - 3.77442I$ |
| $u = -1.358150 + 0.117821I$ | $3.75606 - 0.57966I$ | $0$ |
| $u = -1.358150 - 0.117821I$ | $3.75606 + 0.57966I$ | $0$ |
| $u = -1.341400 + 0.274423I$ | $11.31320 - 2.49652I$ | $0$ |
| $u = -1.341400 - 0.274423I$ | $11.31320 + 2.49652I$ | $0$ |
| $u = \phantom{-}1.359690 + 0.179256I$ | $4.62275 + 3.19043I$ | $0$ |
| $u = \phantom{-}1.359690 - 0.179256I$ | $4.62275 - 3.19043I$ | $0$ |
| $u = \phantom{-}0.346107 + 0.516877I$ | $3.67185 + 1.60748I$ | $3.24996 - 4.72497I$ |
| $u = \phantom{-}0.346107 - 0.516877I$ | $3.67185 - 1.60748I$ | $3.24996 + 4.72497I$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = \quad 1.372900 + 0.269136I$ | $3.24781 + 3.83280I$ | $0$ |
| $u = \quad 1.372900 - 0.269136I$ | $3.24781 - 3.83280I$ | $0$ |
| $u = \quad 1.405940 + 0.096755I$ | $7.05839 - 1.92770I$ | $0$ |
| $u = \quad 1.405940 - 0.096755I$ | $7.05839 + 1.92770I$ | $0$ |
| $u = -1.39090 + 0.27872I$ | $1.39970 - 7.10603I$ | $0$ |
| $u = -1.39090 - 0.27872I$ | $1.39970 + 7.10603I$ | $0$ |
| $u = -1.41073 + 0.20337I$ | $9.24476 - 4.28144I$ | $0$ |
| $u = -1.41073 - 0.20337I$ | $9.24476 + 4.28144I$ | $0$ |
| $u = \quad 1.40430 + 0.28269I$ | $4.48956 + 10.35090I$ | $0$ |
| $u = \quad 1.40430 - 0.28269I$ | $4.48956 - 10.35090I$ | $0$ |
| $u = -1.43192 + 0.09360I$ | $16.3256 + 3.3059I$ | $0$ |
| $u = -1.43192 - 0.09360I$ | $16.3256 - 3.3059I$ | $0$ |
| $u = -1.41356 + 0.28666I$ | $13.6424 - 12.1723I$ | $0$ |
| $u = -1.41356 - 0.28666I$ | $13.6424 + 12.1723I$ | $0$ |
| $u = \quad 1.43291 + 0.20603I$ | $19.0325 + 4.5978I$ | $0$ |
| $u = \quad 1.43291 - 0.20603I$ | $19.0325 - 4.5978I$ | $0$ |
| $u = -0.151330 + 0.440993I$ | $-0.189683 - 0.842364I$ | $-4.63984 + 8.09333I$ |
| $u = -0.151330 - 0.440993I$ | $-0.189683 + 0.842364I$ | $-4.63984 - 8.09333I$ |

**II. u-Polynomials**

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1$ | $u^{48} - 11u^{47} + \cdots - 336u + 41$ |
| $c_2, c_3, c_8$ | $u^{48} - u^{47} + \cdots + 2u^2 + 1$ |
| $c_4, c_7$ | $u^{48} + u^{47} + \cdots + 150u + 61$ |
| $c_5, c_6, c_{10}$<br>$c_{11}, c_{12}$ | $u^{48} + u^{47} + \cdots + 2u + 1$ |
| $c_9$ | $u^{48} + 3u^{47} + \cdots + 4u + 1$ |

**III. Riley Polynomials**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1$ | $y^{48} + 9y^{47} + \cdots + 21912y + 1681$ |
| $c_2, c_3, c_8$ | $y^{48} - 43y^{47} + \cdots + 4y + 1$ |
| $c_4, c_7$ | $y^{48} - 27y^{47} + \cdots + 17760y + 3721$ |
| $c_5, c_6, c_{10}$<br>$c_{11}, c_{12}$ | $y^{48} + 61y^{47} + \cdots + 4y + 1$ |
| $c_9$ | $y^{48} + y^{47} + \cdots - 36y^2 + 1$ |