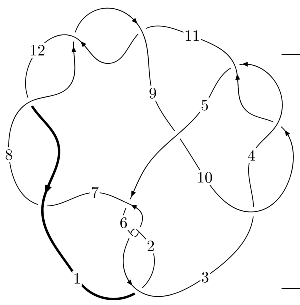
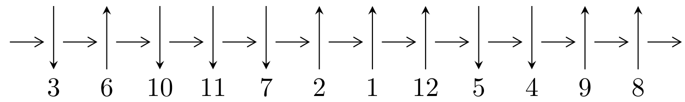
# $12a_{0454}$ ($K12a_{0454}$)




A knot diagram[1]

**Linearized knot diagam**




**Solving Sequence**

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

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

$$I_1^u = \langle u^{51} - u^{50} + \cdots + 2u + 1 \rangle$$

* 1 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 51 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. $I^u_1 = \langle u^{51} - u^{50} + \cdots + 2u + 1\rangle$

**(i) Arc colorings**

$$a_5 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_4 = \begin{pmatrix}1\\-u^2\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-u^2+1\\u^4-2u^2\end{pmatrix}$$
$$a_9 = \begin{pmatrix}-u^3+2u\\-u^3+u\end{pmatrix}$$
$$a_{12} = \begin{pmatrix}u^7-4u^5+4u^3\\u^7-3u^5+2u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}-u^{11}+6u^9-12u^7+8u^5-u^3+2u\\-u^{11}+5u^9-8u^7+3u^5+u^3+u\end{pmatrix}$$
$$a_1 = \begin{pmatrix}u^{15}-8u^{13}+24u^{11}-32u^9+18u^7-8u^5+8u^3\\u^{15}-7u^{13}+18u^{11}-19u^9+6u^7-2u^5+4u^3+u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-u^{19}+10u^{17}-40u^{15}+80u^{13}-83u^{11}+50u^9-36u^7+24u^5-u^3+2u\\-u^{19}+9u^{17}-32u^{15}+55u^{13}-45u^{11}+19u^9-16u^7+10u^5+3u^3+u\end{pmatrix}$$
$$a_6 = \begin{pmatrix}u^{38}-19u^{36}+\cdots+2u^2+1\\u^{38}-18u^{36}+\cdots+6u^4+u^2\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-u^{21}+10u^{19}+\cdots+6u^3-u\\u^{23}-11u^{21}+\cdots+6u^3+u\end{pmatrix}$$

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

**(iii) Cusp Shapes** $= 4u^{49} - 96u^{47} + \cdots - 24u - 6$

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

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{51} + 19u^{50} + \cdots - 6u - 1$ |
| $c_2, c_6$ | $u^{51} - u^{50} + \cdots + 3u^2 + 1$ |
| $c_3, c_4, c_{10}$ | $u^{51} - u^{50} + \cdots + 2u + 1$ |
| $c_7, c_8, c_{11}$ $c_{12}$ | $u^{51} + 5u^{50} + \cdots + 60u + 7$ |
| $c_9$ | $u^{51} + 3u^{50} + \cdots - 2294u - 851$ |

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

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y^{51} + 27y^{50} + \cdots - 46y - 1$ |
| $c_2, c_6$ | $y^{51} + 19y^{50} + \cdots - 6y - 1$ |
| $c_3, c_4, c_{10}$ | $y^{51} - 49y^{50} + \cdots - 6y - 1$ |
| $c_7, c_8, c_{11}$ $c_{12}$ | $y^{51} + 63y^{50} + \cdots - 1230y - 49$ |
| $c_9$ | $y^{51} - 29y^{50} + \cdots + 13032066y - 724201$ |

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

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u = -0.497159 + 0.687033I$ | $-12.69280 + 2.28721I$ | $-7.99809 - 2.91340I$ |
| $u = -0.497159 - 0.687033I$ | $-12.69280 - 2.28721I$ | $-7.99809 + 2.91340I$ |
| $u = -0.514014 + 0.669274I$ | $-8.53754 - 4.85587I$ | $-4.54813 + 1.85081I$ |
| $u = -0.514014 - 0.669274I$ | $-8.53754 + 4.85587I$ | $-4.54813 - 1.85081I$ |
| $u = -0.476017 + 0.696319I$ | $-8.40118 + 9.40330I$ | $-4.15224 - 7.59831I$ |
| $u = -0.476017 - 0.696319I$ | $-8.40118 - 9.40330I$ | $-4.15224 + 7.59831I$ |
| $u = 0.476316 + 0.685506I$ | $-6.77395 - 3.90642I$ | $-1.99681 + 3.09904I$ |
| $u = 0.476316 - 0.685506I$ | $-6.77395 + 3.90642I$ | $-1.99681 - 3.09904I$ |
| $u = 0.502151 + 0.665862I$ | $-6.86920 - 0.58725I$ | $-2.24865 + 2.79780I$ |
| $u = 0.502151 - 0.665862I$ | $-6.86920 + 0.58725I$ | $-2.24865 - 2.79780I$ |
| $u = -1.230860 + 0.105090I$ | $-0.223422 - 0.095504I$ | $0$ |
| $u = -1.230860 - 0.105090I$ | $-0.223422 + 0.095504I$ | $0$ |
| $u = 1.252200 + 0.136529I$ | $-0.53663 - 5.16209I$ | $0$ |
| $u = 1.252200 - 0.136529I$ | $-0.53663 + 5.16209I$ | $0$ |
| $u = -1.30322$ | $-3.07453$ | $0$ |
| $u = 0.288268 + 0.603646I$ | $0.37640 - 6.82727I$ | $-0.33113 + 9.54781I$ |
| $u = 0.288268 - 0.603646I$ | $0.37640 + 6.82727I$ | $-0.33113 - 9.54781I$ |
| $u = 0.379930 + 0.522272I$ | $-3.67336 - 1.67891I$ | $-7.63362 + 4.68207I$ |
| $u = 0.379930 - 0.522272I$ | $-3.67336 + 1.67891I$ | $-7.63362 - 4.68207I$ |
| $u = -0.255571 + 0.575911I$ | $1.26731 + 1.64575I$ | $2.07350 - 4.49112I$ |
| $u = -0.255571 - 0.575911I$ | $1.26731 - 1.64575I$ | $2.07350 + 4.49112I$ |
| $u = 1.378680 + 0.061133I$ | $-5.19429 - 2.37699I$ | $0$ |
| $u = 1.378680 - 0.061133I$ | $-5.19429 + 2.37699I$ | $0$ |
| $u = 0.479281 + 0.376899I$ | $-0.51645 + 3.54279I$ | $-3.97592 - 2.38269I$ |
| $u = 0.479281 - 0.376899I$ | $-0.51645 - 3.54279I$ | $-3.97592 + 2.38269I$ |
| $u = 1.384830 + 0.203376I$ | $-3.94332 - 4.47861I$ | $0$ |
| $u = 1.384830 - 0.203376I$ | $-3.94332 + 4.47861I$ | $0$ |
| $u = 1.395460 + 0.136782I$ | $-5.14352 - 2.78940I$ | $0$ |
| $u = 1.395460 - 0.136782I$ | $-5.14352 + 2.78940I$ | $0$ |
| $u = -1.396860 + 0.217411I$ | $-4.98503 + 9.81269I$ | $0$ |

| Solutions to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-1.396860-0.217411I$ | $-4.98503-9.81269I$ | $0$ |
| $u=-0.023873+0.568833I$ | $3.28231+2.57953I$ | $6.80307-3.85321I$ |
| $u=-0.023873-0.568833I$ | $3.28231-2.57953I$ | $6.80307+3.85321I$ |
| $u=-1.42782+0.18011I$ | $-9.44989+4.23941I$ | $0$ |
| $u=-1.42782-0.18011I$ | $-9.44989-4.23941I$ | $0$ |
| $u=-1.43604+0.12595I$ | $-6.55813-1.72068I$ | $0$ |
| $u=-1.43604-0.12595I$ | $-6.55813+1.72068I$ | $0$ |
| $u=-0.429960+0.261562I$ | $0.244440+1.222020I$ | $-3.00114-3.76024I$ |
| $u=-0.429960-0.261562I$ | $0.244440-1.222020I$ | $-3.00114+3.76024I$ |
| $u=-1.49311+0.24266I$ | $-13.1596+7.2936I$ | $0$ |
| $u=-1.49311-0.24266I$ | $-13.1596-7.2936I$ | $0$ |
| $u=1.49510+0.24697I$ | $-14.7939-12.8461I$ | $0$ |
| $u=1.49510-0.24697I$ | $-14.7939+12.8461I$ | $0$ |
| $u=-1.49838+0.22938I$ | $-13.36680+3.84685I$ | $0$ |
| $u=-1.49838-0.22938I$ | $-13.36680-3.84685I$ | $0$ |
| $u=1.50158+0.23862I$ | $-19.1879-5.6622I$ | $0$ |
| $u=1.50158-0.23862I$ | $-19.1879+5.6622I$ | $0$ |
| $u=1.50376+0.22747I$ | $-15.1019+1.5937I$ | $0$ |
| $u=1.50376-0.22747I$ | $-15.1019-1.5937I$ | $0$ |
| $u=-0.206294+0.390192I$ | $0.029465+0.870630I$ | $0.74153-7.77097I$ |
| $u=-0.206294-0.390192I$ | $0.029465-0.870630I$ | $0.74153+7.77097I$ |

## II. u-Polynomials

| Crossings | u-Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $u^{51} + 19u^{50} + \cdots - 6u - 1$ |
| $c_2, c_6$ | $u^{51} - u^{50} + \cdots + 3u^2 + 1$ |
| $c_3, c_4, c_{10}$ | $u^{51} - u^{50} + \cdots + 2u + 1$ |
| $c_7, c_8, c_{11}$ $c_{12}$ | $u^{51} + 5u^{50} + \cdots + 60u + 7$ |
| $c_9$ | $u^{51} + 3u^{50} + \cdots - 2294u - 851$ |

**III. Riley Polynomials**

| Crossings | Riley Polynomials at each crossing |
|---|---|
| $c_1, c_5$ | $y^{51} + 27y^{50} + \cdots - 46y - 1$ |
| $c_2, c_6$ | $y^{51} + 19y^{50} + \cdots - 6y - 1$ |
| $c_3, c_4, c_{10}$ | $y^{51} - 49y^{50} + \cdots - 6y - 1$ |
| $c_7, c_8, c_{11}$ $c_{12}$ | $y^{51} + 63y^{50} + \cdots - 1230y - 49$ |
| $c_9$ | $y^{51} - 29y^{50} + \cdots + 13032066y - 724201$ |