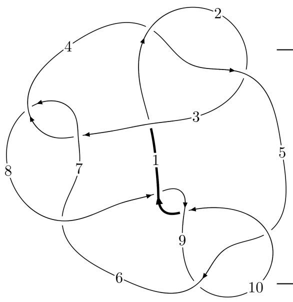
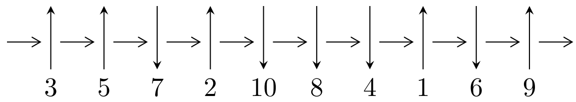
10_{71} $(K10a_{10})$



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

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

$$I_1^u = \langle u^{27} + 5u^{25} + \cdots + b + u,\ -u^{39} - u^{38} + \cdots + a - 4u,\ u^{40} + 2u^{39} + \cdots + 4u^2 + 1\rangle$$
$$I_2^u = \langle b + u + 1,\ a,\ u^2 + u + 1\rangle$$

* 2 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 42 representations.

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[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.

$$\boldsymbol{I_1^u = \langle u^{27}+5u^{25}+\cdots+b+u,\ -u^{39}-u^{38}+\cdots+a-4u,\ u^{40}+2u^{39}+\cdots+4u^2+1\rangle}$$

(i) Arc colorings

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

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} u^{39}+u^{38}+\cdots-5u^2+4u \\ -u^{27}-5u^{25}+\cdots+4u^2-u \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} u^{21}+4u^{19}+\cdots-4u^2+3u \\ -u^{39}-2u^{38}+\cdots-u-1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{39}-u^{38}+\cdots+3u-1 \\ -2u^{39}-4u^{38}+\cdots-4u^2-2 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^4+u^2+1 \\ u^4 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^9-2u^7-3u^5-2u^3-u \\ -u^9-u^7-u^5+u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes

$= u^{39}+9u^{38}+17u^{37}+66u^{36}+94u^{35}+285u^{34}+329u^{33}+852u^{32}+826u^{31}+1962u^{30}+1576u^{29}+3630u^{28}+2362u^{27}+5577u^{26}+2755u^{25}+7286u^{24}+2421u^{23}+8227u^{22}+1323u^{21}+8198u^{20}-136u^{19}+7289u^{18}-1361u^{17}+5878u^{16}-1976u^{15}+4322u^{14}-1882u^{13}+2864u^{12}-1394u^{11}+1700u^{10}-826u^9+838u^8-385u^7+329u^6-157u^5+92u^4-42u^3+7u^2-5u+6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{40} - 21u^{39} + \cdots - 3u + 1$
c_2, c_4	$u^{40} + 3u^{39} + \cdots + 3u + 1$
c_3, c_7	$u^{40} + u^{39} + \cdots - 8u + 4$
c_5, c_9	$u^{40} - 2u^{39} + \cdots + 4u^2 + 1$
c_6	$u^{40} + 15u^{39} + \cdots + 120u + 16$
c_8, c_{10}	$u^{40} - 14u^{39} + \cdots - 8u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{40} - y^{39} + \cdots + 17y + 1$
c_2, c_4	$y^{40} - 21y^{39} + \cdots - 3y + 1$
c_3, c_7	$y^{40} - 15y^{39} + \cdots - 120y + 16$
c_5, c_9	$y^{40} + 14y^{39} + \cdots + 8y + 1$
c_6	$y^{40} + 17y^{39} + \cdots + 2016y + 256$
c_8, c_{10}	$y^{40} + 26y^{39} + \cdots + 44y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.725993 + 0.653238I$ $a = -1.77855 + 1.81598I$ $b = -2.56295 - 0.04821I$	$0.63968 + 1.74616I$	$0.044303 - 1.257582I$
$u = 0.725993 - 0.653238I$ $a = -1.77855 - 1.81598I$ $b = -2.56295 + 0.04821I$	$0.63968 - 1.74616I$	$0.044303 + 1.257582I$
$u = 0.657117 + 0.787048I$ $a = 1.66831 + 0.40061I$ $b = 0.89334 + 1.41707I$	$-1.07354 - 2.17702I$	$-2.16670 + 4.43587I$
$u = 0.657117 - 0.787048I$ $a = 1.66831 - 0.40061I$ $b = 0.89334 - 1.41707I$	$-1.07354 + 2.17702I$	$-2.16670 - 4.43587I$
$u = 0.096376 + 1.028080I$ $a = 0.442341 + 0.052565I$ $b = -0.722317 + 0.146557I$	$2.32493 - 2.41163I$	$2.33571 + 3.34704I$
$u = 0.096376 - 1.028080I$ $a = 0.442341 - 0.052565I$ $b = -0.722317 - 0.146557I$	$2.32493 + 2.41163I$	$2.33571 - 3.34704I$
$u = -0.824710 + 0.626683I$ $a = -1.67414 - 1.41541I$ $b = -2.39518 + 0.13829I$	$-1.20323 - 7.65538I$	$-1.63964 + 4.86252I$
$u = -0.824710 - 0.626683I$ $a = -1.67414 + 1.41541I$ $b = -2.39518 - 0.13829I$	$-1.20323 + 7.65538I$	$-1.63964 - 4.86252I$
$u = -0.789408 + 0.675423I$ $a = 1.235380 + 0.007261I$ $b = 1.156310 - 0.509552I$	$-3.72005 - 2.44717I$	$-4.96365 + 1.04542I$
$u = -0.789408 - 0.675423I$ $a = 1.235380 - 0.007261I$ $b = 1.156310 + 0.509552I$	$-3.72005 + 2.44717I$	$-4.96365 - 1.04542I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.386153 + 0.965172I$ $a = -0.238506 + 0.455641I$ $b = -0.397991 + 0.639039I$	$0.74845 - 2.81821I$	$-1.95524 + 6.55211I$
$u = 0.386153 - 0.965172I$ $a = -0.238506 - 0.455641I$ $b = -0.397991 - 0.639039I$	$0.74845 + 2.81821I$	$-1.95524 - 6.55211I$
$u = -0.023616 + 1.041760I$ $a = -1.087150 - 0.838239I$ $b = 0.393277 - 1.005930I$	$6.00686 + 1.32070I$	$7.28134 - 0.72610I$
$u = -0.023616 - 1.041760I$ $a = -1.087150 + 0.838239I$ $b = 0.393277 + 1.005930I$	$6.00686 - 1.32070I$	$7.28134 + 0.72610I$
$u = -0.650732 + 0.672523I$ $a = 0.172779 + 0.250083I$ $b = -0.359504 - 0.987978I$	$1.25887 + 0.68759I$	$-0.543601 + 0.759704I$
$u = -0.650732 - 0.672523I$ $a = 0.172779 - 0.250083I$ $b = -0.359504 + 0.987978I$	$1.25887 - 0.68759I$	$-0.543601 - 0.759704I$
$u = 0.095598 + 1.116440I$ $a = -0.834103 + 0.849030I$ $b = 0.370183 + 0.684126I$	$5.21580 - 6.90989I$	$5.24227 + 6.39245I$
$u = 0.095598 - 1.116440I$ $a = -0.834103 - 0.849030I$ $b = 0.370183 - 0.684126I$	$5.21580 + 6.90989I$	$5.24227 - 6.39245I$
$u = 0.639866 + 0.934630I$ $a = -0.19632 + 1.43499I$ $b = -1.28155 + 0.60102I$	$-0.60920 - 2.86826I$	$-1.22261 + 1.95241I$
$u = 0.639866 - 0.934630I$ $a = -0.19632 - 1.43499I$ $b = -1.28155 - 0.60102I$	$-0.60920 + 2.86826I$	$-1.22261 - 1.95241I$

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.777168+0.837928I$ $a=-0.91272-1.60741I$ $b=-2.00597-0.19942I$	$-6.21108+0.22925I$	$-5.84725+0.24543I$
$u=-0.777168-0.837928I$ $a=-0.91272+1.60741I$ $b=-2.00597+0.19942I$	$-6.21108-0.22925I$	$-5.84725-0.24543I$
$u=-0.762796+0.899428I$ $a=1.74060+0.53261I$ $b=2.07413-1.05941I$	$-6.02457+5.56367I$	$-5.18066-6.01609I$
$u=-0.762796-0.899428I$ $a=1.74060-0.53261I$ $b=2.07413+1.05941I$	$-6.02457-5.56367I$	$-5.18066+6.01609I$
$u=-0.651476+0.987984I$ $a=0.197553+0.008658I$ $b=-0.673463-1.012420I$	$2.21178+4.43619I$	$1.72906-5.48285I$
$u=-0.651476-0.987984I$ $a=0.197553-0.008658I$ $b=-0.673463+1.012420I$	$2.21178-4.43619I$	$1.72906+5.48285I$
$u=0.559538+1.043730I$ $a=0.204110+0.051194I$ $b=-0.743272+0.884629I$	$2.37466+0.03317I$	$2.30074-1.92960I$
$u=0.559538-1.043730I$ $a=0.204110-0.051194I$ $b=-0.743272-0.884629I$	$2.37466-0.03317I$	$2.30074+1.92960I$
$u=0.674430+1.003370I$ $a=1.99901-1.47152I$ $b=3.05304+1.06309I$	$1.68055-7.12390I$	$1.84913+6.13601I$
$u=0.674430-1.003370I$ $a=1.99901+1.47152I$ $b=3.05304-1.06309I$	$1.68055+7.12390I$	$1.84913-6.13601I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.710235 + 0.337827I$ $a = 0.496293 - 0.392962I$ $b = -0.069099 + 0.837495I$	$0.39800 - 4.72692I$	$-1.63267 + 6.05913I$
$u = 0.710235 - 0.337827I$ $a = 0.496293 + 0.392962I$ $b = -0.069099 - 0.837495I$	$0.39800 + 4.72692I$	$-1.63267 - 6.05913I$
$u = -0.705098 + 1.010600I$ $a = -0.462757 - 1.241560I$ $b = -1.290960 - 0.160212I$	$-2.70648 + 8.09252I$	$-2.94350 - 6.08172I$
$u = -0.705098 - 1.010600I$ $a = -0.462757 + 1.241560I$ $b = -1.290960 + 0.160212I$	$-2.70648 - 8.09252I$	$-2.94350 + 6.08172I$
$u = -0.703890 + 1.042830I$ $a = 1.61753 + 1.43395I$ $b = 2.91214 - 0.75501I$	$0.05370 + 13.38520I$	$0.42075 - 9.35928I$
$u = -0.703890 - 1.042830I$ $a = 1.61753 - 1.43395I$ $b = 2.91214 + 0.75501I$	$0.05370 - 13.38520I$	$0.42075 + 9.35928I$
$u = 0.566007 + 0.177460I$ $a = 0.944370 + 0.216688I$ $b = 0.239645 - 0.184623I$	$-1.47568 - 0.52119I$	$-6.28438 + 0.91978I$
$u = 0.566007 - 0.177460I$ $a = 0.944370 - 0.216688I$ $b = 0.239645 + 0.184623I$	$-1.47568 + 0.52119I$	$-6.28438 - 0.91978I$
$u = -0.222419 + 0.359701I$ $a = -0.03404 + 1.68269I$ $b = -0.589808 - 0.653481I$	$1.75548 + 0.68997I$	$4.17661 + 0.16492I$
$u = -0.222419 - 0.359701I$ $a = -0.03404 - 1.68269I$ $b = -0.589808 + 0.653481I$	$1.75548 - 0.68997I$	$4.17661 - 0.16492I$

II. $I_2^u = \langle b+u+1,\ a,\ u^2+u+1\rangle$

(i) Arc colorings

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

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u-1 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -u \\ -u-1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0 \\ -u-1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u \\ u+1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u \\ -2u-2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0 \\ -u-1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -4u+1$

(iv) u-Polynomials at the component

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

(v) Riley Polynomials at the component

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

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 + 0.866025I$ $a = 0$ $b = -0.500000 - 0.866025I$	$1.64493 + 2.02988I$	$3.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = 0$ $b = -0.500000 + 0.866025I$	$1.64493 - 2.02988I$	$3.00000 + 3.46410I$

III. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1	$((u+1)^2)(u^{40} - 21u^{39} + \cdots - 3u + 1)$
c_2	$((u+1)^2)(u^{40} + 3u^{39} + \cdots + 3u + 1)$
c_3, c_7	$u^2(u^{40} + u^{39} + \cdots - 8u + 4)$
c_4	$((u-1)^2)(u^{40} + 3u^{39} + \cdots + 3u + 1)$
c_5	$(u^2 - u + 1)(u^{40} - 2u^{39} + \cdots + 4u^2 + 1)$
c_6	$u^2(u^{40} + 15u^{39} + \cdots + 120u + 16)$
c_8	$(u^2 + u + 1)(u^{40} - 14u^{39} + \cdots - 8u + 1)$
c_9	$(u^2 + u + 1)(u^{40} - 2u^{39} + \cdots + 4u^2 + 1)$
c_{10}	$(u^2 - u + 1)(u^{40} - 14u^{39} + \cdots - 8u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1	$((y-1)^2)(y^{40} - y^{39} + \cdots + 17y + 1)$
c_2, c_4	$((y-1)^2)(y^{40} - 21y^{39} + \cdots - 3y + 1)$
c_3, c_7	$y^2(y^{40} - 15y^{39} + \cdots - 120y + 16)$
c_5, c_9	$(y^2 + y + 1)(y^{40} + 14y^{39} + \cdots + 8y + 1)$
c_6	$y^2(y^{40} + 17y^{39} + \cdots + 2016y + 256)$
c_8, c_{10}	$(y^2 + y + 1)(y^{40} + 26y^{39} + \cdots + 44y + 1)$