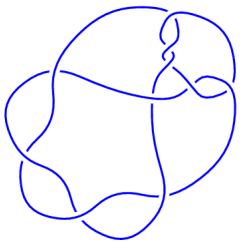
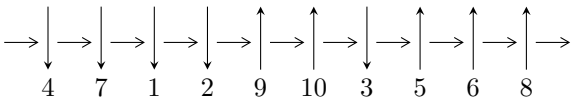
10_{48} $(K10a_{79})$



[1]

Arc Sequences



Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{2} I_i^u$$

$I_1^u = \langle a^2 + a - 1,\ b,\ u - 1 \rangle$
$I_2^u = \langle u^{26} - 3u^{25} + \cdots - 9u^2 - 1,\ 2u^{25} - 3u^{24} + \cdots + b + 1,\ 3u^{25} - 4u^{24} + \cdots + 2a + 3 \rangle$

There are 2 irreducible components with 28 representations.

[1] The knot diagram image is adapter from "C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, http://www.indiana.edu/ knotinfo"

I. $I_1^u = \langle a^2 + a - 1,\ b,\ u - 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 5$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.61803$ $b = 0$	7.23771	5.00000
$u = 1.00000$ $a = 0.618034$ $b = 0$	-0.657974	5.00000

II.

$\boldsymbol{I_2^u = \langle u^{26}-3u^{25}+\cdots-9u^2-1,\ 2u^{25}-3u^{24}+\cdots+b+1,\ 3u^{25}-4u^{24}+\cdots+2a+3\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{3}{2}u^{25} + 2u^{24} + \cdots - \frac{15}{2}u - \frac{3}{2} \\ -2u^{25} + 3u^{24} + \cdots - 2u - 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{3}{2}u^{25} + 2u^{24} + \cdots - \frac{15}{2}u - \frac{3}{2} \\ \frac{3}{2}u^{25} - 3u^{24} + \cdots - \frac{1}{2}u + \frac{3}{2} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{2}u^{25} - u^{24} + \cdots - \frac{7}{2}u - \frac{1}{2} \\ -\frac{1}{2}u^{25} + u^{24} + \cdots - \frac{1}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{2}u^{25} - u^{24} + \cdots - \frac{7}{2}u + \frac{1}{2} \\ -u^7 + 3u^5 + 2u^4 - 2u^3 - 4u^2 - u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{1}{2}u^{25} + 6u^{23} + \cdots - \frac{15}{2}u - \frac{3}{2} \\ 3u^{25} - 5u^{24} + \cdots + 14u^2 + 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^{25} + 3u^{24} + 47u^{23} - 17u^{22} - 248u^{21} - 21u^{20} + 744u^{19} + 432u^{18} - 1274u^{17} - 1555u^{16} + 894u^{15} + 2682u^{14} + 830u^{13} - 2170u^{12} - 2214u^{11} + 190u^{10} + 1502u^9 + 792u^8 - 125u^7 - 221u^6 - 54u^5 - 89u^4 - 118u^3 - 54u^2 + 4u + 1$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.391236-0.188512I$ $a=\ \ 1.070413-0.235267I$ $b=\ \ 1.87529-2.10880I$	$3.48759-3.82064I$	$0.89607+2.40126I$
$u=-1.391236+0.188512I$ $a=\ \ 1.070413+0.235267I$ $b=\ \ 1.87529+2.10880I$	$3.48759+3.82064I$	$0.89607-2.40126I$
$u=-1.343902-0.071348I$ $a=-0.342162+0.379199I$ $b=-0.63975+2.10165I$	$-3.27468-1.70414I$	$-2.66466+3.89699I$
$u=-1.343902+0.071348I$ $a=-0.342162-0.379199I$ $b=-0.63975-2.10165I$	$-3.27468+1.70414I$	$-2.66466-3.89699I$
$u=-0.878676-0.575534I$ $a=-1.25305+0.72364I$ $b=\ \ 0.071717+0.625709I$	$4.66926+1.10360I$	$0.162083-0.384354I$
$u=-0.878676+0.575534I$ $a=-1.25305-0.72364I$ $b=\ \ 0.071717-0.625709I$	$4.66926-1.10360I$	$0.162083+0.384354I$
$u=-0.865819$ $a=\ \ 0.326651$ $b=-0.364658$	-1.22611	-10.4965
$u=-0.557648-0.540231I$ $a=\ \ 0.731221+0.115201I$ $b=-0.139839+0.169070I$	$-1.59551-0.48344I$	$-4.02832-0.08458I$
$u=-0.557648+0.540231I$ $a=\ \ 0.731221-0.115201I$ $b=-0.139839-0.169070I$	$-1.59551+0.48344I$	$-4.02832+0.08458I$
$u=-0.403777-0.726209I$ $a=-0.166289-0.900683I$ $b=\ \ 0.294786-0.784403I$	$-0.89453-3.84444I$	$-0.49259+7.28090I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.403777+0.726209I$ $a=-0.166289+0.900683I$ $b=\ \ 0.294786+0.784403I$	$-0.89453+3.84444I$	$-0.49259-7.28090I$
$u=-0.330593-0.851302I$ $a=-0.47819+1.65273I$ $b=-0.60804+1.35634I$	$6.35171-6.10679I$	$2.97747+5.14405I$
$u=-0.330593+0.851302I$ $a=-0.47819-1.65273I$ $b=-0.60804-1.35634I$	$6.35171+6.10679I$	$2.97747-5.14405I$
$u=\ \ 0.075738-0.290375I$ $a=-0.04394+2.15442I$ $b=\ \ 0.512456+0.395630I$	$1.166696+0.399409I$	$7.28789-1.42640I$
$u=\ \ 0.075738+0.290375I$ $a=-0.04394-2.15442I$ $b=\ \ 0.512456-0.395630I$	$1.166696-0.399409I$	$7.28789+1.42640I$
$u=\ \ 0.259688-0.494614I$ $a=-1.23552-2.55466I$ $b=-0.880046-0.886686I$	$8.75625+1.27302I$	$7.34031-0.88258I$
$u=\ \ 0.259688+0.494614I$ $a=-1.23552+2.55466I$ $b=-0.880046+0.886686I$	$8.75625-1.27302I$	$7.34031+0.88258I$
$u=\ \ 1.25836$ $a=-1.32966$ $b=\ \ 0.227753$	6.22196	-3.01543
$u=\ \ 1.45576-0.04814I$ $a=\ \ 0.825848-0.069396I$ $b=\ \ 0.764431-0.391611I$	$-3.39138+0.04941I$	$-2.26185+0.23755I$
$u=\ \ 1.45576+0.04814I$ $a=\ \ 0.825848+0.069396I$ $b=\ \ 0.764431+0.391611I$	$-3.39138-0.04941I$	$-2.26185-0.23755I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.46140 - 0.33031I$ $a = 1.008094 + 0.354468I$ $b = 0.96069 + 2.36911I$	$0.59945 + 10.37890I$	$-0.23306 - 5.66856I$
$u = 1.46140 + 0.33031I$ $a = 1.008094 - 0.354468I$ $b = 0.96069 - 2.36911I$	$0.59945 - 10.37890I$	$-0.23306 + 5.66856I$
$u = 1.47480 - 0.26620I$ $a = -0.368266 - 0.472378I$ $b = -0.25171 - 2.13870I$	$-6.97144 + 7.45946I$	$-3.34661 - 6.43325I$
$u = 1.47480 + 0.26620I$ $a = -0.368266 + 0.472378I$ $b = -0.25171 + 2.13870I$	$-6.97144 - 7.45946I$	$-3.34661 + 6.43325I$
$u = 1.48218 - 0.19094I$ $a = -0.246657 + 0.429290I$ $b = -0.39153 + 1.65497I$	$-8.11148 + 3.15061I$	$-5.88075 - 0.93673I$
$u = 1.48218 + 0.19094I$ $a = -0.246657 - 0.429290I$ $b = -0.39153 - 1.65497I$	$-8.11148 - 3.15061I$	$-5.88075 + 0.93673I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u-1)^2(u^{26}+3u^{25}+\cdots-9u^2-1)$
c_2, c_7	$u^2(u^{26}+u^{25}+\cdots+17u^2-4)$
c_3, c_4	$(u+1)^2(u^{26}+3u^{25}+\cdots-9u^2-1)$
c_5, c_6	$(u^2-u-1)(u^{26}+2u^{25}+\cdots-3u+1)$
c_8, c_9	$(u^2+u-1)(u^{26}+2u^{25}+\cdots-3u+1)$
c_{10}	$(u^2+u-1)(u^{26}+6u^{25}+\cdots+57u-9)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_4	$(y-1)^2(y^{26}-25y^{25}+\cdots+18y+1)$
c_2, c_7	$y^2(y^{26}-15y^{25}+\cdots-136y+16)$
c_5, c_6, c_8 c_9	$(y^2-3y+1)(y^{26}-30y^{25}+\cdots-19y+1)$
c_{10}	$(y^2-3y+1)(y^{26}+6y^{25}+\cdots-3159y+81)$