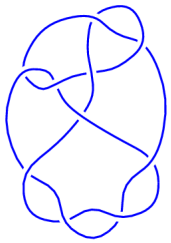
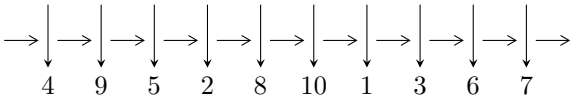
10_{49} $(K10a_{13})$



[1]

Arc Sequences



Solving Sequence

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

Representation Ideals

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

$I_1^u = \langle b^2 - b - 1,\ -b + a,\ u - 1 \rangle$
$I_2^u = \langle u^{31} - 3u^{30} + \cdots + 3u + 1,\ -u^{30} + 2u^{29} + \cdots + 2a - 3,\ -3u^{30} + 8u^{29} + \cdots + 2b + 5 \rangle$

There are 2 irreducible components with 33 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. $\boldsymbol{I_1^u = \langle b^2 - b - 1,\ -b + a,\ u - 1 \rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} b \\ b \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 2b \\ b \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -2b - 1 \\ -b - 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -b - 2 \\ -b - 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} b \\ b \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -15$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = \quad 1.00000$ $a = -0.618034$ $b = -0.618034$	-2.63189	-15.0000
$u = \quad 1.00000$ $a = \quad 1.61803$ $b = \quad 1.61803$	-10.5276	-15.0000

II. $I_2^u =$
$\langle u^{31}-3u^{30}+\cdots+3u+1,\ -u^{30}+2u^{29}+\cdots+2a-3,\ -3u^{30}+8u^{29}+\cdots+2b+5\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_4 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1\\u^2\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-u\\-u^3+u\end{pmatrix}$$
$$a_3 = \begin{pmatrix}u^3\\u^5-u^3+u\end{pmatrix}$$
$$a_8 = \begin{pmatrix}\frac{1}{2}u^{30}-u^{29}+\cdots-4u+\frac{3}{2}\\ \frac{3}{2}u^{30}-4u^{29}+\cdots-8u-\frac{5}{2}\end{pmatrix}$$
$$a_7 = \begin{pmatrix}2u^{30}-5u^{29}+\cdots-12u-1\\ \frac{3}{2}u^{30}-4u^{29}+\cdots-8u-\frac{5}{2}\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^{30}-2u^{29}+\cdots-3u+1\\ \frac{1}{2}u^{30}-u^{29}+\cdots-u-\frac{1}{2}\end{pmatrix}$$
$$a_6 = \begin{pmatrix}\frac{1}{2}u^{30}-u^{29}+\cdots-2u+\frac{1}{2}\\ \frac{1}{2}u^{30}-u^{29}+\cdots+4u^2-\frac{1}{2}\end{pmatrix}$$
$$a_9 = \begin{pmatrix}\frac{5}{2}u^{30}-7u^{29}+\cdots-16u-\frac{3}{2}\\ \frac{1}{2}u^{30}-2u^{29}+\cdots-5u-\frac{3}{2}\end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= 4u^{30}-11u^{29}-19u^{28}+90u^{27}-5u^{26}-319u^{25}+271u^{24}+596u^{23}-1004u^{22}-458u^{21}+1978u^{20}-532u^{19}-2361u^{18}+1995u^{17}+1541u^{16}-2818u^{15}-54u^{14}+2396u^{13}-952u^{12}-1322u^{11}+1040u^{10}+496u^9-688u^8-138u^7+378u^6+10u^5-174u^4+26u^3+57u^2-15u-19$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.287083-0.212219I$ $a=-1.337496+0.088563I$ $b=-1.57353+0.09063I$	$-9.92171+2.45212I$	$-15.0553-2.8825I$
$u=-1.287083+0.212219I$ $a=-1.337496-0.088563I$ $b=-1.57353-0.09063I$	$-9.92171-2.45212I$	$-15.0553+2.8825I$
$u=-1.181361-0.139448I$ $a=\ \ 0.521575+0.061831I$ $b=\ \ 0.574643-0.305412I$	$-2.56499+0.98527I$	$-12.14842-6.83319I$
$u=-1.181361+0.139448I$ $a=\ \ 0.521575-0.061831I$ $b=\ \ 0.574643+0.305412I$	$-2.56499-0.98527I$	$-12.14842+6.83319I$
$u=-1.050277-0.533782I$ $a=\ \ 0.08702-2.48336I$ $b=\ \ 1.57590+0.11764I$	$-9.15652-5.11817I$	$-15.5151+3.8713I$
$u=-1.050277+0.533782I$ $a=\ \ 0.08702+2.48336I$ $b=\ \ 1.57590-0.11764I$	$-9.15652+5.11817I$	$-15.5151-3.8713I$
$u=-0.962056-0.459783I$ $a=-0.41171+1.77107I$ $b=-0.605796-0.419305I$	$-1.75392-3.16934I$	$-13.1405+6.2492I$
$u=-0.962056+0.459783I$ $a=-0.41171-1.77107I$ $b=-0.605796+0.419305I$	$-1.75392+3.16934I$	$-13.1405-6.2492I$
$u=-0.769917-0.297207I$ $a=\ \ 0.855259-0.806158I$ $b=-0.283148+0.347355I$	$-0.846644-0.285966I$	$-10.27924-1.27611I$
$u=-0.769917+0.297207I$ $a=\ \ 0.855259+0.806158I$ $b=-0.283148-0.347355I$	$-0.846644+0.285966I$	$-10.27924+1.27611I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.428067-0.584731I$ $a=-1.70282+0.51757I$ $b=\ \ 1.54559-0.05817I$	$-7.37189+0.63906I$	$-13.31985+1.04274I$
$u=-0.428067+0.584731I$ $a=-1.70282-0.51757I$ $b=\ \ 1.54559+0.05817I$	$-7.37189-0.63906I$	$-13.31985-1.04274I$
$u=-0.209883$ $a=\ \ 2.20773$ $b=-0.440544$	-0.703249	-13.8910
$u=\ \ 0.328959-0.893060I$ $a=\ \ 0.543136+0.684797I$ $b=-1.56849-0.15264I$	$-4.51872-5.93011I$	$-10.96804+3.41229I$
$u=\ \ 0.328959+0.893060I$ $a=\ \ 0.543136-0.684797I$ $b=-1.56849+0.15264I$	$-4.51872+5.93011I$	$-10.96804-3.41229I$
$u=\ \ 0.421042-0.816336I$ $a=-0.287248-0.996935I$ $b=\ \ 0.605327+0.533968I$	$2.77360-3.43811I$	$-7.57029+4.39561I$
$u=\ \ 0.421042+0.816336I$ $a=-0.287248+0.996935I$ $b=\ \ 0.605327-0.533968I$	$2.77360+3.43811I$	$-7.57029-4.39561I$
$u=\ \ 0.550611-0.747136I$ $a=\ \ 0.034880+1.175443I$ $b=\ \ 0.331449-0.582530I$	$3.57659+0.38668I$	$-5.31318-2.65084I$
$u=\ \ 0.550611+0.747136I$ $a=\ \ 0.034880-1.175443I$ $b=\ \ 0.331449+0.582530I$	$3.57659-0.38668I$	$-5.31318+2.65084I$
$u=\ \ 0.772937-0.727885I$ $a=\ \ 0.453468-1.024034I$ $b=-1.400591+0.076803I$	$-1.80597+2.68803I$	$-9.99041-3.16248I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.772937 + 0.727885I$ $a = 0.453468 + 1.024034I$ $b = -1.400591 - 0.076803I$	$-1.80597 - 2.68803I$	$-9.99041 + 3.16248I$
$u = 0.914360 - 0.492640I$ $a = -0.351905 - 0.216863I$ $b = -0.942627 - 0.191065I$	$-1.73768 + 1.98261I$	$-12.51789 - 2.95931I$
$u = 0.914360 + 0.492640I$ $a = -0.351905 + 0.216863I$ $b = -0.942627 + 0.191065I$	$-1.73768 - 1.98261I$	$-12.51789 + 2.95931I$
$u = 0.975824 - 0.331564I$ $a = 1.47804 + 0.36735I$ $b = 1.65145 + 0.04258I$	$-10.63136 + 1.14909I$	$-14.4727 - 5.7136I$
$u = 0.975824 + 0.331564I$ $a = 1.47804 - 0.36735I$ $b = 1.65145 - 0.04258I$	$-10.63136 - 1.14909I$	$-14.4727 + 5.7136I$
$u = 1.035598 - 0.617832I$ $a = -0.505525 - 0.630042I$ $b = 0.216063 + 0.636597I$	$2.12474 + 4.80226I$	$-7.72031 - 3.44347I$
$u = 1.035598 + 0.617832I$ $a = -0.505525 + 0.630042I$ $b = 0.216063 - 0.636597I$	$2.12474 - 4.80226I$	$-7.72031 + 3.44347I$
$u = 1.113368 - 0.619169I$ $a = 0.61303 + 1.36706I$ $b = 0.696545 - 0.545292I$	$0.71112 + 8.80296I$	$-11.07196 - 8.43090I$
$u = 1.113368 + 0.619169I$ $a = 0.61303 - 1.36706I$ $b = 0.696545 + 0.545292I$	$0.71112 - 8.80296I$	$-11.07196 + 8.43090I$
$u = 1.171005 - 0.613023I$ $a = -0.59357 - 2.02694I$ $b = -1.60251 + 0.16367I$	$-7.05058 + 11.45319I$	$-13.9714 - 7.0213I$
$u = 1.171005 + 0.613023I$ $a = -0.59357 + 2.02694I$ $b = -1.60251 - 0.16367I$	$-7.05058 - 11.45319I$	$-13.9714 + 7.0213I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u-1)^2(u^{31}+3u^{30}+\cdots+3u-1)$
c_2, c_8	$u^2(u^{31}+u^{30}+\cdots+12u+4)$
c_3	$(u-1)^2(u^{31}+15u^{30}+\cdots+29u+1)$
c_4	$(u+1)^2(u^{31}+3u^{30}+\cdots+3u-1)$
c_5	$(u^2+u-1)(u^{31}+8u^{30}+\cdots+14u-7)$
c_6, c_7	$(u^2+u-1)(u^{31}+2u^{30}+\cdots+2u+1)$
c_9, c_{10}	$(u^2-u-1)(u^{31}+2u^{30}+\cdots+2u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y-1)^2(y^{31}-15y^{30}+\cdots+29y-1)$
c_2, c_8	$y^2(y^{31}+15y^{30}+\cdots-8y-16)$
c_3	$(y-1)^2(y^{31}+5y^{30}+\cdots+505y-1)$
c_5	$(y^2-3y+1)(y^{31}+20y^{29}+\cdots-602y-49)$
c_6, c_7, c_{10}	$(y^2-3y+1)(y^{31}-36y^{30}+\cdots+10y-1)$
c_9	$+1.00000000000(1y^2-3.0000000000y+1.00000000000)$ $(1y^{31}-36.000000000y^{30}+\cdots+10.0000000000y-1.00000000000)$