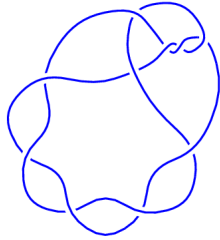
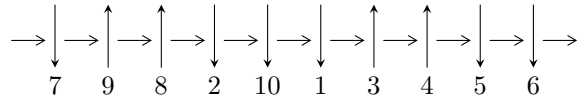


10₉ (K10a₁₁₀)

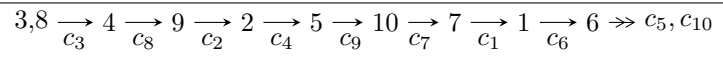


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle u - 1 \rangle$$

$$I_2^u = \langle u^{18} - 8u^{16} + \dots + u + 1 \rangle$$

There are 2 irreducible components with 19 representations.

¹The knot diagram image is adapter from “C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, <http://www.indiana.edu/~knotinfo>”

$$\mathbf{I. } I_1^u = \langle u - 1 \rangle$$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

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

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

$$a_5 = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = -6

(iv) Complex Volumes and Cusp Shapes

	Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	1.00000	-1.64493	-6.00000

$$\text{II. } I_2^u = \langle u^{18} - 8u^{16} - u^{15} + 25u^{14} + 7u^{13} - 35u^{12} - 18u^{11} + 13u^{10} + 18u^9 + 16u^8 - u^7 - 9u^6 - 5u^5 - 7u^4 - 3u^3 + 2u^2 + u + 1 \rangle$$

(i) Arc colorings

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

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

$$a_4 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^4 + u^2 + 1 \\ u^6 - 2u^4 + u^2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^8 - 3u^6 + u^4 + 2u^2 + 1 \\ -u^{10} + 4u^8 - 5u^6 + 2u^4 - u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{15} + 6u^{13} - 12u^{11} + 6u^9 + 6u^7 - 2u^5 - 4u^3 \\ u^{17} - 7u^{15} + 19u^{13} - 24u^{11} + 13u^9 - 2u^7 + u \end{pmatrix}$$

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

$$a_1 = \begin{pmatrix} u^8 - 3u^6 + u^4 + 2u^2 + 1 \\ -u^8 + 4u^6 - 4u^4 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^{15} - 6u^{13} + 12u^{11} - 6u^9 - 6u^7 + 2u^5 + 4u^3 \\ -u^{15} + 7u^{13} - 18u^{11} + 19u^9 - 4u^7 - 4u^5 + u \end{pmatrix}$$

(ii) Obstruction class = -1

$$\text{(iii) Cusp Shapes} = 4u^{17} - 32u^{15} - 4u^{14} + 100u^{13} + 28u^{12} - 144u^{11} - 72u^{10} + 72u^9 + 76u^8 + 32u^7 - 20u^6 - 28u^5 - 4u^4 - 12u^3 - 8u^2 + 8u - 2$$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.377459 - 0.269730I$	$1.32984 + 6.64718I$	$-3.24506 - 6.19689I$
$u = -1.377459 + 0.269730I$	$1.32984 - 6.64718I$	$-3.24506 + 6.19689I$
$u = -1.336420 - 0.120409I$	$3.49531 + 0.56492I$	$-0.70794 + 1.84066I$
$u = -1.336420 + 0.120409I$	$3.49531 - 0.56492I$	$-0.70794 - 1.84066I$
$u = -0.884053 - 0.346992I$	$-11.15466 - 0.27346I$	$-6.21894 - 1.07083I$
$u = -0.884053 + 0.346992I$	$-11.15466 + 0.27346I$	$-6.21894 + 1.07083I$
$u = -0.226840 - 0.766905I$	$-13.25299 + 4.38839I$	$-8.97609 - 3.55329I$
$u = -0.226840 + 0.766905I$	$-13.25299 - 4.38839I$	$-8.97609 + 3.55329I$
$u = -0.181355 - 0.488140I$	$-0.150453 + 1.027515I$	$-2.68106 - 6.45577I$
$u = -0.181355 + 0.488140I$	$-0.150453 - 1.027515I$	$-2.68106 + 6.45577I$
$u = 0.209503 - 0.678973I$	$-3.70552 - 3.19755I$	$-8.61366 + 5.32391I$
$u = 0.209503 + 0.678973I$	$-3.70552 + 3.19755I$	$-8.61366 - 5.32391I$
$u = 0.638700$	-1.71487	-4.98727
$u = 1.366895 - 0.206727I$	$4.78286 - 3.66002I$	$2.48971 + 4.64953I$
$u = 1.366895 + 0.206727I$	$4.78286 + 3.66002I$	$2.48971 - 4.64953I$
$u = 1.39250 - 0.31226I$	$-8.11334 - 8.29410I$	$-4.53964 + 4.66449I$
$u = 1.39250 + 0.31226I$	$-8.11334 + 8.29410I$	$-4.53964 - 4.66449I$
$u = 1.43575$	-3.96483	-2.02739

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_5, c_6 c_9, c_{10}	$(u - 1)(u^{18} + 2u^{17} + \dots + u + 1)$
c_2	$(u)(u^{18} + 3u^{17} + \dots - 3u - 3)$
c_3, c_7, c_8	$(u + 1)(u^{18} - 8u^{16} + \dots - u + 1)$
c_4	$(u + 1)(u^{18} + 4u^{17} + \dots + 5u - 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5, c_6 c_9, c_{10}	$(y - 1)(y^{18} - 24y^{17} + \dots + 3y + 1)$
c_2	$(y)(y^{18} + 3y^{17} + \dots - 39y + 9)$
c_3, c_7, c_8	$(y - 1)(y^{18} - 16y^{17} + \dots + 3y + 1)$
c_4	$(y - 1)(y^{18} + 22y^{16} + \dots - 65y + 1)$