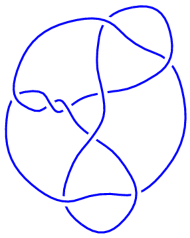
9_{46} $(K9n_5)$



[1]

Arc Sequences

$\rightarrow\downarrow$	$\rightarrow\uparrow$	$\rightarrow\uparrow$	$\rightarrow\uparrow$	$\rightarrow\downarrow$	$\rightarrow\uparrow$	$\rightarrow\downarrow$	$\rightarrow\uparrow$	$\rightarrow\uparrow\rightarrow$
5	7	9	6	1	3	6	4	3

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{3} I_i^u$$

$$I_1^u = \langle u^2 - u + 2,\ b + 1,\ 2a - u - 1 \rangle$$
$$I_2^u = \langle u^2 + 1,\ a + 1,\ b - u \rangle$$
$$I_3^u = \langle u^4 + 4u^2 + 2u + 1,\ a + 1,\ -u^3 + u^2 + 2b - 3u - 1 \rangle$$

There are 3 irreducible components with 8 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. $I_1^u = \langle u^2 - u + 2,\ b + 1,\ 2a - u - 1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} \frac{1}{2}u + \frac{1}{2} \\ -1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} \frac{1}{2}u + \frac{1}{2} \\ 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u + 1 \\ u + 2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{2}u + \frac{3}{2} \\ 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{1}{2}u - \frac{1}{2} \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ -2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u - 2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u - 2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -2$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad 0.50000 - 1.32288I$ $a = \quad 0.750000 - 0.661438I$ $b = -1.00000$	-4.93480	-2.00000
$u = \quad 0.50000 + 1.32288I$ $a = \quad 0.750000 + 0.661438I$ $b = -1.00000$	-4.93480	-2.00000

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

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \quad - 1.00000I$ $a = -1.00000$ $b = \quad - 1.00000I$	-1.64493	0
$u = \quad 1.00000I$ $a = -1.00000$ $b = \quad 1.00000I$	-1.64493	0

III. $I_3^u = \langle u^4 + 4u^2 + 2u + 1,\ a + 1,\ -u^3 + u^2 + 2b - 3u - 1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1 \\ \frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{3}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ \frac{1}{2}u^3 + \frac{1}{2}u^2 + \frac{3}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -u^2 - 1 \\ 2u^2 + 2u + 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -u \\ \frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{1}{2}u - \frac{1}{2} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{3}{2}u - \frac{1}{2} \\ \frac{1}{2}u^3 - \frac{1}{2}u^2 + \frac{3}{2}u + \frac{1}{2} \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 4u^3 + 14u + 8$

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.264316 - 0.422125I$ $a = -1.00000$ $b = 0.219104 - 0.751390I$	$0.426736 + 1.175633I$	$4.79089 - 5.96277I$
$u = -0.264316 + 0.422125I$ $a = -1.00000$ $b = 0.219104 + 0.751390I$	$0.426736 - 1.175633I$	$4.79089 + 5.96277I$
$u = 0.26432 - 1.99036I$ $a = -1.00000$ $b = 1.28090 + 1.27441I$	$-16.8761 - 4.7517I$	$-0.79089 + 2.00586I$
$u = 0.26432 + 1.99036I$ $a = -1.00000$ $b = 1.28090 - 1.27441I$	$-16.8761 + 4.7517I$	$-0.79089 - 2.00586I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_5	$(u-1)^2(u^2+1)(u^4+3u^3+5u^2+3u+2)$
c_2, c_3, c_6 c_8, c_9	$(u^2+1)(u^2+u+2)(u^4+4u^2-2u+1)$
c_4	$(u+1)^4(u^4-u^3+11u^2-11u+4)$
c_7	$(u+1)^2(u^2+3u+4)(u^4+8u^3+18u^2+4u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y-1)^2(y+1)^2(y^4+y^3+11y^2+11y+4)$
c_2, c_3, c_6 c_8, c_9	$(y+1)^2(y^2+3y+4)(y^4+8y^3+18y^2+4y+1)$
c_4	$(y-1)^4(y^4+21y^3+107y^2-33y+16)$
c_7	$(y-1)^2(y^2-y+16)(y^4-28y^3+262y^2+20y+1)$