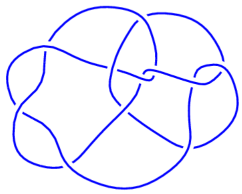
$11n_{49}$ $(K11n_{49})$



[1]

Arc Sequences

$\rightarrow \uparrow_{6} \rightarrow \downarrow_{1} \rightarrow \uparrow_{7} \rightarrow \downarrow_{9} \rightarrow \uparrow_{2} \rightarrow \downarrow_{10} \rightarrow \uparrow_{1} \rightarrow \uparrow_{11} \rightarrow \downarrow_{6} \rightarrow \downarrow_{4} \rightarrow \uparrow_{8} \rightarrow$

6 1 7 9 2 10 1 11 6 4 8

Solving Sequence

$$1,7 \xrightarrow[c_7]{} 8,10 \xrightarrow[c_6]{} 6 \xrightarrow[c_1]{} 2 \xrightarrow[c_5]{} 5 \xrightarrow[c_9]{} 9 \xrightarrow[c_4]{} 4 \xrightarrow[c_3]{} 3 \xrightarrow[c_{11}]{} 11 \gg c_2, c_8, c_{10}$$

Representation Ideals

$$I = \bigcap_{i=1}^{2} I_i^u \bigcap I_1^v$$

$$I_1^u = \langle b^4 + 2b^3 + 7b^2 + 6b + 3,\ 2b^3 + 3b^2 + 15b + 5u + 7,\ -2b^3 - 3b^2 - 15b + 10a - 7\rangle$$
$$I_2^u = \langle u^6 - 2u^5 + 8u^4 - 4u^3 + 12u^2 + 8u + 4,\ u^4 - 2u^3 + 4u^2 + 4b - 2u,$$
$$- u^5 + 4u^4 - 10u^3 + 12u^2 + 12a - 12u + 4\rangle$$

$$I_1^v = \langle b + v - 1,\ v^2 - v + 1,\ a\rangle$$

There are 3 irreducible components with 12 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.

$$\boldsymbol{I_1^u = \langle b^4+2b^3+7b^2+6b+3,\ 2b^3+3b^2+15b+5u+7,\ -2b^3-3b^2-15b+10a-7\rangle}$$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0 \\ -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 3b - \frac{7}{5} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 3b - \frac{7}{5} \\ -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 3b - \frac{7}{5} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{5}b^3 + \frac{3}{10}b^2 + \frac{3}{2}b + \frac{7}{10} \\ b \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{5}b^3 + \frac{3}{10}b^2 + \frac{3}{2}b + \frac{7}{10} \\ -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 2b - \frac{7}{5} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{10}b^3 - \frac{1}{10}b^2 + \frac{1}{2}b + \frac{3}{5} \\ -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 2b - \frac{2}{5} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} \frac{1}{2}b^3 + \frac{1}{2}b^2 + \frac{5}{2}b + 1 \\ -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 2b - \frac{2}{5} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0 \\ \frac{2}{5}b^3 + \frac{3}{5}b^2 + 3b + \frac{7}{5} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{2}b^3 + \frac{1}{2}b^2 + \frac{5}{2}b + 1 \\ \frac{3}{5}b^3 + \frac{2}{5}b^2 + 3b + \frac{8}{5} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{1}{2}b^3 + \frac{1}{2}b^2 + \frac{5}{2}b + 1 \\ -\frac{2}{5}b^3 - \frac{3}{5}b^2 - 2b - \frac{2}{5} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -1 \\ -2 \end{pmatrix}$$

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(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.41421I$ $a = -0.707107I$ $b = -0.500000 - 0.548188I$	$-6.57974 - 2.02988I$	$-6.00000 + 3.46410I$
$u = -1.41421I$ $a = 0.707107I$ $b = -0.500000 + 0.548188I$	$-6.57974 + 2.02988I$	$-6.00000 - 3.46410I$
$u = 1.41421I$ $a = -0.707107I$ $b = -0.50000 - 2.28024I$	$-6.57974 + 2.02988I$	$-6.00000 - 3.46410I$
$u = -1.41421I$ $a = 0.707107I$ $b = -0.50000 + 2.28024I$	$-6.57974 - 2.02988I$	$-6.00000 + 3.46410I$

II. $\boldsymbol{I_2^u = \langle u^6 - 2u^5 + 8u^4 - 4u^3 + 12u^2 + 8u + 4,\ u^4 - 2u^3 + 4u^2 + 4b - 2u,\ -u^5 + 4u^4 - 10u^3 + 12u^2 + 12a - 12u + 4\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{1}{12}u^5 - \frac{1}{3}u^4 + \cdots + u - \frac{1}{3} \\ -\frac{1}{4}u^4 + \frac{1}{2}u^3 - u^2 + \frac{1}{2}u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} \frac{1}{12}u^5 + \frac{1}{6}u^4 + \cdots + u + \frac{2}{3} \\ \frac{1}{6}u^5 + \frac{1}{12}u^4 + \cdots + \frac{3}{2}u + \frac{1}{3} \end{pmatrix}$$
$$a_2 = \begin{pmatrix} \frac{1}{4}u^5 + \frac{1}{2}u^4 + \cdots + u + \frac{3}{2} \\ \frac{1}{3}u^5 + \frac{5}{12}u^4 + \cdots + \frac{3}{2}u + \frac{2}{3} \end{pmatrix}$$
$$a_5 = \begin{pmatrix} \frac{11}{12}u^5 - \frac{17}{12}u^4 + \cdots - \frac{7}{2}u - \frac{7}{6} \\ \frac{5}{6}u^5 - \frac{19}{12}u^4 + \cdots - \frac{5}{2}u - \frac{4}{3} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^3 + 2u \\ u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -\frac{1}{12}u^5 + \frac{1}{12}u^4 + \cdots - \frac{1}{2}u + \frac{5}{6} \\ -\frac{1}{12}u^5 + \frac{1}{12}u^4 + \cdots + \frac{1}{2}u + \frac{1}{3} \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -\frac{1}{12}u^5 + \frac{1}{12}u^4 + \cdots - \frac{1}{2}u + \frac{5}{6} \\ \frac{1}{3}u^5 + \frac{5}{12}u^4 + \cdots + \frac{3}{2}u + \frac{2}{3} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =**unknown**

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.327848 - 0.380167I$ $a = -0.513717 - 0.677222I$ $b = -0.058235 - 0.468561I$	$0.080134 + 1.031469I$	$1.24075 - 6.28341I$
$u = -0.327848 + 0.380167I$ $a = -0.513717 + 0.677222I$ $b = -0.058235 + 0.468561I$	$0.080134 - 1.031469I$	$1.24075 + 6.28341I$
$u = 0.31945 - 1.74021I$ $a = -0.782599 + 0.260942I$ $b = -0.180552 + 0.983566I$	$-4.41014 + 1.50896I$	$-1.48189 - 1.11182I$
$u = 0.31945 + 1.74021I$ $a = -0.782599 - 0.260942I$ $b = -0.180552 - 0.983566I$	$-4.41014 - 1.50896I$	$-1.48189 + 1.11182I$
$u = 1.00840 - 2.01334I$ $a = 0.296316 - 1.198936I$ $b = -0.26121 - 2.10173I$	$9.26481 - 6.90911I$	$-1.75886 + 2.47219I$
$u = 1.00840 + 2.01334I$ $a = 0.296316 + 1.198936I$ $b = -0.26121 + 2.10173I$	$9.26481 + 6.90911I$	$-1.75886 - 2.47219I$

III. $I_1^v = \langle b + v - 1,\ v^2 - v + 1,\ a \rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ -v + 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} v \\ v - 1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 2 \\ v \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -v + 2 \\ v \end{pmatrix}$$
$$a_9 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -v + 1 \\ v \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -v + 2 \\ v \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =**unknown**

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^v		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	$0.500000 - 0.866025I$		
$a =$	0	$-1.64493 + 2.02988I$	$-3.46410I$
$b =$	$0.500000 + 0.866025I$		
$v =$	$0.500000 + 0.866025I$		
$a =$	0	$-1.64493 - 2.02988I$	$3.46410I$
$b =$	$0.500000 - 0.866025I$		

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2+u+1)^3(u^6+7u^5+30u^4+59u^3+78u^2+23u+9)$
c_2	$(u^2+u+1)^3(u^6+11u^5+230u^4+895u^3+3910u^2+875u+81)$
c_3	$(u^2-u+1)(u^4-2u^3+u^2-6u+9)$ $(u^6+u^5+4u^4-203u^3+402u^2+199u+127)$
c_4	$(u^2-u+1)(u^4+2u^3+u^2+6u+9)$ $(u^6+13u^5+64u^4+127u^3+74u^2-17u+41)$
c_5	$(u^2-u+1)^3(u^6+7u^5+30u^4+59u^3+78u^2+23u+9)$
c_6	$(u-1)^2(u+1)^4(u^6+4u^5+9u^4+8u^3+19u^2+4u+3)$
c_7, c_8, c_{11}	$u^2(u^2+2)^2(u^6+2u^5+8u^4+4u^3+12u^2-8u+4)$
c_9	$(u-1)^4(u+1)^2(u^6+4u^5+9u^4+8u^3+19u^2+4u+3)$
c_{10}	$(u^2-u+1)(u^2+u+1)^2(u^6+u^5+4u^4+u^3+8u^2+5u+3)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^2+y+1)^3(y^6+11y^5+230y^4+895y^3+3910y^2+875y+81)$
c_2	$(y^2+y+1)^3(y^6+339y^5+\cdots-132205y+6561)$
c_3	$(y^2+y+1)(y^4-2y^3-5y^2-18y+81)$ $(y^6+7y^5+1226y^4-38137y^3+243414y^2+62507y+16129)$
c_4	$(y^2+y+1)(y^4-2y^3-5y^2-18y+81)$ $(y^6-41y^5+942y^4-6133y^3+15042y^2+5779y+1681)$
c_6, c_9	$(y-1)^6(y^6+2y^5+55y^4+252y^3+351y^2+98y+9)$
c_7, c_8, c_{11}	$y^2(y+2)^4(y^6+12y^5+72y^4+216y^3+272y^2+32y+16)$
c_{10}	$(y^2+y+1)^3(y^6+7y^5+30y^4+59y^3+78y^2+23y+9)$