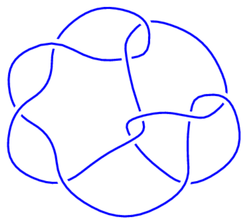
10_{132} $(K10n_{13})$



[1]

Arc Sequences

$\rightarrow \uparrow \rightarrow \uparrow \rightarrow \uparrow \rightarrow \uparrow \rightarrow \uparrow \rightarrow \uparrow \rightarrow \downarrow \rightarrow \downarrow \rightarrow \uparrow \rightarrow \downarrow \rightarrow$

5 10 7 6 2 4 10 7 3 8

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle u^3 - u^2 + 1,\ a + u,\ b + 1\rangle$$
$$I_2^u = \langle u^5 + 2u^4 + 2u^3 + u + 1,\ a - u,\ u^3 + u^2 + b\rangle$$

There are 2 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. $I^u_1 = \langle u^3 - u^2 + 1,\ a + u,\ b + 1 \rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -2u^2 - u + 2$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.754878$ $a = \ \ 0.754878$ $b = -1.00000$	-0.531480	1.61520
$u = \ \ 0.877439 - 0.744862I$ $a = -0.877439 + 0.744862I$ $b = -1.00000$	$-4.66906 - 2.82812I$	$0.69240 + 3.35914I$
$u = \ \ 0.877439 + 0.744862I$ $a = -0.877439 - 0.744862I$ $b = -1.00000$	$-4.66906 + 2.82812I$	$0.69240 - 3.35914I$

II. $I_2^u = \langle u^5 + 2u^4 + 2u^3 + u + 1,\ a - u,\ u^3 + u^2 + b\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u^3 \\ -2u^4 - 3u^3 - 1 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ -u^3 - u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^4 + u^3 + 1 \\ u^4 + u^2 + u \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 3u^3 - u^2 + 2 \\ 5u^4 + 7u^3 - 3u^2 + 3u + 4 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -2u^4 - 2u^3 - 1 \\ -2u^4 + u^3 - u^2 + 1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 11u^4 + 8u^3 - u^2 + 6u + 4 \\ 7u^4 - 19u^3 + 4u^2 + 3u - 7 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= 5u^4 + 6u^3 + 3u^2 - 6u + 7$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.10221-1.09532I$ $a=-1.10221-1.09532I$ $b=-2.64316+0.26340I$	$16.0529+4.0569I$	$0.27760-1.88627I$
$u=-1.10221+1.09532I$ $a=-1.10221+1.09532I$ $b=-2.64316-0.26340I$	$16.0529-4.0569I$	$0.27760+1.88627I$
$u=-0.668466$ $a=-0.668466$ $b=-0.148145$	0.907840	11.5575
$u=\ 0.436447-0.655029I$ $a=\ 0.436447-0.655029I$ $b=\ 0.717228+0.665045I$	$-1.70245-1.37362I$	$-0.55634+3.01933I$
$u=\ 0.436447+0.655029I$ $a=\ 0.436447+0.655029I$ $b=\ 0.717228-0.665045I$	$-1.70245+1.37362I$	$-0.55634-3.01933I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^3 - u^2 + 1)(u^5 + 2u^4 + 2u^3 + u + 1)$
c_2, c_9	$u^3(u^5 + u^4 + 17u^3 - 4u^2 + 20u - 8)$
c_3, c_4	$(u^3 + u^2 + 2u + 1)(u^5 + 6u^3 + u + 1)$
c_5	$(u^3 + u^2 - 1)(u^5 + 2u^4 + 2u^3 + u + 1)$
c_6	$(u^3 - u^2 + 2u - 1)(u^5 + 6u^3 + u + 1)$
c_7	$(u - 1)^3(u^5 + 4u^4 + u^3 - 5u^2 + 6u + 1)$
c_8	$(u + 1)^3(u^5 + 14u^4 + 53u^3 + 21u^2 + 46u + 1)$
c_{10}	$(u + 1)^3(u^5 + 4u^4 + u^3 - 5u^2 + 6u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^3 - y^2 + 2y - 1)(y^5 + 6y^3 + y - 1)$
c_2, c_9	$y^3(y^5 + 33y^4 + 337y^3 + 680y^2 + 336y - 64)$
c_3, c_4, c_6	$(y^3 + 3y^2 + 2y - 1)(y^5 + 12y^4 + 38y^3 + 12y^2 + y - 1)$
c_7, c_{10}	$(y-1)^3(y^5 - 14y^4 + 53y^3 - 21y^2 + 46y - 1)$
c_8	$(y-1)^3(y^5 - 90y^4 + 2313y^3 + 4407y^2 + 2074y - 1)$