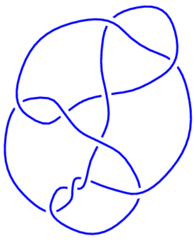
10_{131} $(K10n_{19})$



[1]

Arc Sequences

$$\rightarrow \downarrow_{4} \rightarrow \uparrow_{8} \rightarrow \downarrow_{5} \rightarrow \downarrow_{2} \rightarrow \downarrow_{8} \rightarrow \downarrow_{10} \rightarrow \downarrow_{1} \rightarrow \uparrow_{2} \rightarrow \downarrow_{7} \rightarrow \downarrow_{6} \rightarrow$$

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle b^3 + b^2 + 2b + 1,\ u - 1,\ -b + a + 1 \rangle$$
$$I_2^u = \langle u^{18} - 4u^{17} + \cdots + 3u - 1,\ u^{17} - 3u^{16} + \cdots + 4a + 5,\ u^{17} - 3u^{16} + \cdots + 4b + 1 \rangle$$

There are 2 irreducible components with 21 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. $\boldsymbol{I_1^u = \langle b^3 + b^2 + 2b + 1,\ u - 1,\ -b + a + 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -5b^2 - 4b - 16$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.00000$ $a = -1.56984$ $b = -0.569840$	-2.75839	-15.3442
$u = 1.00000$ $a = -1.21508 - 1.30714I$ $b = -0.215080 - 1.307141I$	$1.37919 - 2.82812I$	$-6.82789 + 2.41717I$
$u = 1.00000$ $a = -1.21508 + 1.30714I$ $b = -0.215080 + 1.307141I$	$1.37919 + 2.82812I$	$-6.82789 - 2.41717I$

II.

$$I_2^u = \langle u^{18} - 4u^{17} + \cdots + 3u - 1,\ u^{17} - 3u^{16} + \cdots + 4a + 5,\ u^{17} - 3u^{16} + \cdots + 4b + 1\rangle$$

(i) Arc colorings

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

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -\frac{1}{4}u^{17} + \frac{3}{4}u^{16} + \cdots - \frac{3}{2}u - \frac{5}{4} \\ -\frac{1}{4}u^{17} + \frac{3}{4}u^{16} + \cdots + \frac{1}{2}u - \frac{1}{4} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{11}{4}u^{17} + \frac{35}{4}u^{16} + \cdots + 6u - \frac{9}{4} \\ -2u^{17} + \frac{13}{2}u^{16} + \cdots + \frac{9}{2}u - \frac{5}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -5u^{17} + 18u^{16} + \cdots + 11u - 10 \\ -\frac{5}{4}u^{17} + \frac{21}{4}u^{16} + \cdots + 4u - \frac{15}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{15}{4}u^{17} + \frac{51}{4}u^{16} + \cdots + 7u - \frac{25}{4} \\ -\frac{5}{4}u^{17} + \frac{21}{4}u^{16} + \cdots + 4u - \frac{15}{4} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^3 \\ -u^5 + u^3 - u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{17}{4}u^{17} + \frac{57}{4}u^{16} + \cdots + 8u - \frac{31}{4} \\ -\frac{11}{4}u^{17} + \frac{35}{4}u^{16} + \cdots + 5u - \frac{17}{4} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -3u^{17} + \frac{23}{2}u^{16} - 15u^{15} - \frac{33}{2}u^{14} + \frac{127}{2}u^{13} - \frac{91}{2}u^{12} - 68u^{11} + 110u^{10} - \frac{11}{2}u^9 - \frac{175}{2}u^8 - 2u^7 + 53u^6 + 27u^5 - 75u^4 - 14u^3 + 41u^2 + \frac{21}{2}u - \frac{29}{2}$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.189206 - 0.282581I$ $a = 1.43576 + 0.78808I$ $b = 0.051790 + 1.344455I$	$2.07423 - 1.22055I$	$-3.51872 - 0.07112I$
$u = -1.189206 + 0.282581I$ $a = 1.43576 - 0.78808I$ $b = 0.051790 - 1.344455I$	$2.07423 + 1.22055I$	$-3.51872 + 0.07112I$
$u = -1.10588$ $a = 1.27324$ $b = 0.334161$	-2.12974	-1.01837
$u = -0.509257 - 0.343539I$ $a = -0.118556 + 0.636675I$ $b = -0.380850 - 0.301405I$	$-0.575696 - 1.116816I$	$-6.38496 + 6.15764I$
$u = -0.509257 + 0.343539I$ $a = -0.118556 - 0.636675I$ $b = -0.380850 + 0.301405I$	$-0.575696 + 1.116816I$	$-6.38496 - 6.15764I$
$u = -0.405572 - 0.756937I$ $a = -0.511486 + 1.207991I$ $b = -0.12430 - 1.42145I$	$4.97233 - 2.95811I$	$-1.13170 + 3.60082I$
$u = -0.405572 + 0.756937I$ $a = -0.511486 - 1.207991I$ $b = -0.12430 + 1.42145I$	$4.97233 + 2.95811I$	$-1.13170 - 3.60082I$
$u = 0.441998$ $a = -2.38885$ $b = -0.662052$	-1.60276	-5.18594
$u = 0.550076 - 0.259421I$ $a = -2.10081 + 1.63815I$ $b = -0.262040 + 1.270410I$	$2.36168 + 3.34376I$	$-0.22641 - 4.65236I$
$u = 0.550076 + 0.259421I$ $a = -2.10081 - 1.63815I$ $b = -0.262040 - 1.270410I$	$2.36168 - 3.34376I$	$-0.22641 + 4.65236I$

Solution to I_2^u		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$0.841043 - 1.112378I$		
$a =$	$0.218185 - 0.109146I$	$12.50877 - 2.04734I$	$-0.610263 + 0.647242I$
$b =$	$0.21016 + 1.52072I$		
$u =$	$0.841043 + 1.112378I$		
$a =$	$0.218185 + 0.109146I$	$12.50877 + 2.04734I$	$-0.610263 - 0.647242I$
$b =$	$0.21016 - 1.52072I$		
$u =$	$0.889957 - 0.956699I$		
$a =$	$0.639432 + 0.360381I$	$5.67221 + 1.09047I$	$-3.82592 + 0.42258I$
$b =$	$0.658112 + 0.569573I$		
$u =$	$0.889957 + 0.956699I$		
$a =$	$0.639432 - 0.360381I$	$5.67221 - 1.09047I$	$-3.82592 - 0.42258I$
$b =$	$0.658112 - 0.569573I$		
$u =$	$1.023452 - 0.903197I$		
$a =$	$1.289146 + 0.364109I$	$5.25155 + 5.76942I$	$-4.89628 - 5.17142I$
$b =$	$0.740141 - 0.450201I$		
$u =$	$1.023452 + 0.903197I$		
$a =$	$1.289146 - 0.364109I$	$5.25155 - 5.76942I$	$-4.89628 + 5.17142I$
$b =$	$0.740141 + 0.450201I$		
$u =$	$1.13145 - 0.93287I$		
$a =$	$1.70614 - 0.00878I$	$11.5470 + 9.4650I$	$-1.80359 - 5.12935I$
$b =$	$0.27093 - 1.49425I$		
$u =$	$1.13145 + 0.93287I$		
$a =$	$1.70614 + 0.00878I$	$11.5470 - 9.4650I$	$-1.80359 + 5.12935I$
$b =$	$0.27093 + 1.49425I$		

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_4	$(u+1)^3(u^{18}+4u^{17}+\cdots-3u-1)$
c_2, c_8	$u^3(u^{18}+u^{17}+\cdots+4u+8)$
c_3	$(u-1)^3(u^{18}+4u^{17}+\cdots+11u+1)$
c_5	$(u^3+u^2-1)(u^{18}+2u^{17}+\cdots-5u^2+1)$
c_6, c_9, c_{10}	$(u^3-u^2+2u-1)(u^{18}+2u^{17}+\cdots-2u-1)$
c_7	$(u^3-u^2+1)(u^{18}+2u^{17}+\cdots+18u-17)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y-1)^3(y^{18}-4y^{17}+\cdots-11y+1)$
c_2, c_8	$y^3(y^{18}-21y^{17}+\cdots-592y+64)$
c_3	$(y-1)^3(y^{18}+24y^{17}+\cdots-11y+1)$
c_5	$(y^3-y^2+2y-1)(y^{18}+22y^{17}+\cdots-10y+1)$
c_6, c_9, c_{10}	$(y^3+3y^2+2y-1)(y^{18}+18y^{17}+\cdots-10y+1)$
c_7	$(y^3-y^2+2y-1)(y^{18}+10y^{17}+\cdots-1106y+289)$