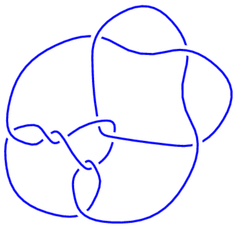
$11n_{99}$ $(K11n_{99})$



[1]

Arc Sequences

$\rightarrow \uparrow 7 \rightarrow \downarrow 1 \rightarrow \uparrow 8 \rightarrow \uparrow 7 \rightarrow \downarrow 10 \rightarrow \uparrow 2 \rightarrow \uparrow 4 \rightarrow \uparrow 11 \rightarrow \uparrow 1 \rightarrow \downarrow 5 \rightarrow \uparrow 9 \rightarrow$

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{4} I_i^u$$

$$\begin{aligned}
I_1^u &= \langle u+1,\ a+1,\ 2b-1\rangle\\
I_2^u &= \langle a^4+3a^2+1,\ a^3+2a+u,\ a^3+a^2+b+3a+2\rangle\\
I_3^u &= \langle u^{12}-u^{11}+8u^{10}-11u^9+26u^8-40u^7+45u^6-58u^5+38u^4-27u^3+3u^2+u-1,\\
&\quad 7u^{11}-6u^{10}+62u^9-75u^8+201u^7-297u^6+316u^5-434u^4+236u^3-169u^2+32b+6u+1,\\
&\quad -9u^{11}+10u^{10}-74u^9+109u^8-247u^7+399u^6-444u^5+582u^4-412u^3+271u^2+16a-82u+1\rangle\\
I_4^u &= \langle u^{12}+3u^{11}+10u^{10}+22u^9+41u^8+63u^7+81u^6+85u^5+75u^4+53u^3+32u^2+12u+9,\\
&\quad -5444u^{11}-27924u^{10}+\cdots+35601b-15318,\ 8542u^{11}+46692u^{10}+\cdots+106803a+142269\rangle
\end{aligned}$$

There are 4 irreducible components with 29 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. $I_1^u = \langle u+1,\ a+1,\ 2b-1 \rangle$

(i) Arc colorings

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

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

$a_9 = \begin{pmatrix} -1 \\ -\frac{1}{2} \end{pmatrix}$

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

$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

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

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

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

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

$a_{10} = \begin{pmatrix} -1 \\ \frac{1}{2} \end{pmatrix}$

$a_6 = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$

$a_6 = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = -1.00000$ $b = 0.500000$	3.28987	14.2500

II. $\boldsymbol{I_2^u = \langle a^4 + 3a^2 + 1,\ a^3 + 2a + u,\ a^3 + a^2 + b + 3a + 2\rangle}$

(i) Arc colorings

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

(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
$u = 1.00000I$ $a = -0.618034I$ $b = -1.61803 + 1.61803I$	-2.30291	4.00000
$u = -1.00000I$ $a = 0.618034I$ $b = -1.61803 - 1.61803I$	-2.30291	4.00000
$u = -1.00000I$ $a = -1.61803I$ $b = 0.618034 + 0.618034I$	5.59278	4.00000
$u = 1.00000I$ $a = 1.61803I$ $b = 0.618034 - 0.618034I$	5.59278	4.00000

III. $\boldsymbol{I^u_3 =}$
$\boldsymbol{\langle u^{12} - u^{11} + \cdots + u - 1,\ 7u^{11} - 6u^{10} + \cdots + 32b + 1,\ -9u^{11} + 10u^{10} + \cdots + 16a + 1\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} \frac{9}{16}u^{11} - \frac{5}{8}u^{10} + \cdots + \frac{41}{8}u - \frac{1}{16} \\ -0.218750u^{11} + 0.187500u^{10} + \cdots - 0.187500u - 0.0312500 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{1}{16}u^{11} - \frac{3}{8}u^{10} + \cdots + \frac{47}{8}u - \frac{13}{16} \\ -0.0312500u^{11} + 0.0625000u^{10} + \cdots - 0.0625000u + 0.0312500 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{4}u^{10} + \frac{1}{4}u^9 + \cdots - \frac{1}{4}u + \frac{5}{4} \\ \frac{1}{4}u^{10} - \frac{1}{4}u^9 + \cdots + \frac{1}{4}u - \frac{1}{4} \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{10} + \frac{1}{4}u^9 + \cdots - \frac{1}{4}u + \frac{5}{4} \\ \frac{1}{4}u^{10} - \frac{1}{4}u^9 + \cdots + \frac{1}{4}u - \frac{1}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^2 + 1 \\ -u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{5}{16}u^{11} - \frac{5}{8}u^{10} + \cdots + \frac{41}{8}u - \frac{5}{16} \\ -0.343750u^{11} + 0.437500u^{10} + \cdots + 0.0625000u + 0.0937500 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{4}u^{11} + \frac{1}{4}u^{10} + \cdots - \frac{1}{4}u^2 + \frac{9}{4}u \\ \frac{1}{4}u^{11} - \frac{1}{4}u^{10} + \cdots + \frac{1}{4}u^2 - \frac{5}{4}u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{4}u^{11} + \frac{1}{4}u^{10} + \cdots - \frac{1}{4}u^2 + \frac{9}{4}u \\ \frac{1}{4}u^{11} - \frac{1}{4}u^{10} + \cdots + \frac{1}{4}u^2 - \frac{5}{4}u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =**unknown**

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.46036-1.59632I$ $a=\ \ 0.617140-0.709434I$ $b=-1.96352+0.61798I$	$-9.7228+11.6344I$	$3.05947-5.63312I$
$u=-0.46036+1.59632I$ $a=\ \ 0.617140+0.709434I$ $b=-1.96352-0.61798I$	$-9.7228-11.6344I$	$3.05947+5.63312I$
$u=-0.286848$ $a=-3.85090$ $b=\ \ 0.748460$	2.08000	2.69919
$u=-0.22221-1.69295I$ $a=-0.740223-0.119924I$ $b=\ \ 1.93980-0.00808I$	$-13.9790+4.8530I$	$0.50797-2.30086I$
$u=-0.22221+1.69295I$ $a=-0.740223+0.119924I$ $b=\ \ 1.93980+0.00808I$	$-13.9790-4.8530I$	$0.50797+2.30086I$
$u=\ \ 0.06595-1.61394I$ $a=\ \ 0.453344+0.915914I$ $b=-1.50627-0.49543I$	$-9.24108-2.07346I$	$2.05543+1.04459I$
$u=\ \ 0.06595+1.61394I$ $a=\ \ 0.453344-0.915914I$ $b=-1.50627+0.49543I$	$-9.24108+2.07346I$	$2.05543-1.04459I$
$u=\ \ 0.257303-0.306472I$ $a=\ \ 1.046990+0.141189I$ $b=-0.098944-0.484685I$	$0.367468-0.926038I$	$6.49064+7.55473I$
$u=\ \ 0.257303+0.306472I$ $a=\ \ 1.046990-0.141189I$ $b=-0.098944+0.484685I$	$0.367468+0.926038I$	$6.49064-7.55473I$
$u=\ \ 0.376488-0.828316I$ $a=-0.62795-1.54039I$ $b=\ \ 0.204419+0.641684I$	$6.26923-1.30619I$	$9.66269+5.18573I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.376488 + 0.828316I$ $a = -0.62795 + 1.54039I$ $b = 0.204419 - 0.641684I$	$6.26923 + 1.30619I$	$9.66269 - 5.18573I$
$u = 1.25251$ $a = -0.647705$ $b = 0.600571$	2.82934	-4.50161

IV. $I^u_4 = \langle u^{12} + 3u^{11} + \cdots + 12u + 9,\ -5444u^{11} - 27924u^{10} + \cdots + 35601b - 15318,\ 8542u^{11} + 46692u^{10} + \cdots + 106803a + 142269\rangle$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} -0.0799790u^{11} - 0.437179u^{10} + \cdots - 3.87384u - 1.33207 \\ 0.152917u^{11} + 0.784360u^{10} + \cdots + 1.96624u + 0.430269 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.133517u^{11} - 0.508019u^{10} + \cdots - 3.93721u - 1.26106 \\ 0.170388u^{11} + 0.741721u^{10} + \cdots + 2.13137u + 0.590377 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 0.0356638u^{11} + 0.0533693u^{10} + \cdots - 0.249731u - 0.511334 \\ -1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.144116u^{11} + 0.338530u^{10} + \cdots + 0.0727601u - 0.0287351 \\ -0.108452u^{11} - 0.285161u^{10} + \cdots - 0.322491u - 1.48260 \end{pmatrix}$$

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

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

$$a_{10} = \begin{pmatrix} -0.152056u^{11} - 0.454201u^{10} + \cdots - 4.64191u - 1.49740 \\ 0.367630u^{11} + 1.16710u^{10} + \cdots + 2.50369u - 0.129435 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.151307u^{11} + 0.543917u^{10} + \cdots + 3.37438u + 2.30940 \\ 0.0134266u^{11} - 0.158170u^{10} + \cdots + 1.12047u - 0.655094 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.151307u^{11} + 0.543917u^{10} + \cdots + 3.37438u + 2.30940 \\ 0.0134266u^{11} - 0.158170u^{10} + \cdots + 1.12047u - 0.655094 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.172057 - 0.407463I$ $a = 0.965356 + 0.141124I$ $b = -0.891259 + 0.143836I$	$-3.28987 + 5.69302I$	$4.00000 - 5.51057I$
$u = -1.172057 + 0.407463I$ $a = 0.965356 - 0.141124I$ $b = -0.891259 - 0.143836I$	$-3.28987 - 5.69302I$	$4.00000 + 5.51057I$
$u = -0.793458 - 0.920250I$ $a = -0.184052 - 0.624049I$ $b = -0.0718625 - 0.0733467I$	$-5.18047 + 0.92430I$	$0.283283 - 0.794226I$
$u = -0.793458 + 0.920250I$ $a = -0.184052 + 0.624049I$ $b = -0.0718625 + 0.0733467I$	$-5.18047 - 0.92430I$	$0.283283 + 0.794226I$
$u = -0.12359 - 1.51263I$ $a = 0.459386 - 0.245578I$ $b = -1.50589 - 0.10109I$	$-5.18047 - 0.92430I$	$0.283283 + 0.794226I$
$u = -0.12359 + 1.51263I$ $a = 0.459386 + 0.245578I$ $b = -1.50589 + 0.10109I$	$-5.18047 + 0.92430I$	$0.283283 - 0.794226I$
$u = 0.007520 - 1.191128I$ $a = -0.242797 + 0.842914I$ $b = 1.82424 - 1.33658I$	$-1.39926 + 0.92430I$	$7.71672 - 0.79423I$
$u = 0.007520 + 1.191128I$ $a = -0.242797 - 0.842914I$ $b = 1.82424 + 1.33658I$	$-1.39926 - 0.92430I$	$7.71672 + 0.79423I$
$u = 0.250689 - 0.621966I$ $a = 0.96746 + 1.22138I$ $b = -1.37089 + 1.38232I$	$-1.39926 - 0.92430I$	$7.71672 + 0.79423I$
$u = 0.250689 + 0.621966I$ $a = 0.96746 - 1.22138I$ $b = -1.37089 - 1.38232I$	$-1.39926 + 0.92430I$	$7.71672 - 0.79423I$

Solution to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.33089 - 1.60761I$ $a = -0.465356 - 0.572259I$ $b = 1.51567 + 0.58147I$	$-3.28987 - 5.69302I$	$4.00000 + 5.51057I$
$u = 0.33089 + 1.60761I$ $a = -0.465356 + 0.572259I$ $b = 1.51567 - 0.58147I$	$-3.28987 + 5.69302I$	$4.00000 - 5.51057I$

V. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_3, c_4	$(u+1)(u^2+1)^2(u^{12}-u^{11}+\cdots+u-1)(u^{12}+3u^{11}+\cdots+12u+9)$
c_2	$(u-1)(u+1)^4(u^{12}+11u^{11}+\cdots+432u+81)$ $(u^{12}+15u^{11}+\cdots-7u+1)$
c_5, c_{10}	$(u)(u^4+3u^2+1)(1-u+2u^3-u^4-u^5+u^6)^2(u^{12}+3u^{11}+\cdots+30u+8)$
c_6, c_7	$(u-1)(u^2+1)^2(u^{12}-u^{11}+\cdots+u-1)(u^{12}+3u^{11}+\cdots+12u+9)$
c_8, c_9	$(u+1)(u^2-u-1)^2(u^6+u^5-u^4-2u^3+u+1)^2$ $(u^{12}+2u^{11}+\cdots+7u-4)$
c_{11}	$(u-1)(u^2+u-1)^2(u^6+u^5-u^4-2u^3+u+1)^2$ $(u^{12}+2u^{11}+\cdots+7u-4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_4 c_6, c_7	$(y-1)(y+1)^4(y^{12}+11y^{11}+\cdots+432y+81)$ $(y^{12}+15y^{11}+\cdots-7y+1)$
c_2	$(y-1)^5(y^{12}-37y^{11}+\cdots-75y+1)$ $(y^{12}-21y^{11}+\cdots-8100y+6561)$
c_5, c_{10}	$y(y^2+3y+1)^2(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^2$ $(y^{12}+3y^{11}+\cdots-180y+64)$
c_8, c_9, c_{11}	$(y-1)(y^2-3y+1)^2(y^6-3y^5+5y^4-4y^3+2y^2-y+1)^2$ $(y^{12}-10y^{11}+\cdots-65y+16)$