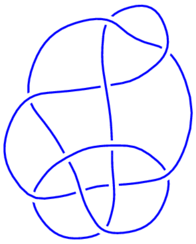
$11n_{85}$ ($K11n_{85}$)



1

Arc Sequences

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

↑	↓	↓	↑	↑	↓	↓	↓	↑	↓	↑
6	1	8	11	2	3	9	5	3	8	9

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{3} I_i^u \bigcap I_1^v$$

$I_1^u = \langle a^6 + a^4 + a^3 + a^2 - a + 1,\ -a^5 - a^2 + b - a + 1,\ -a^5 - a^4 - 2a^3 - a^2 - 2a + 2u - 1\rangle$
$I_2^u = \langle u^4 + 2u^2 + 2,\ u^3 + 2a + 2u,\ u^3 + u^2 + b + 2u + 1\rangle$
$I_3^u = \langle u^{23} + 2u^{22} + \cdots + 4u + 2,\ -u^{22} - 5u^{20} + \cdots + 4a - 2,\ -3u^{22} - 4u^{21} + \cdots + 4b - 4\rangle$

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

There are 4 irreducible components with 34 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.

$$I_1^u = \langle a^6+a^4+a^3+a^2-a+1,\ -a^5-a^2+b-a+1,\ -a^5-a^4-2a^3-a^2-2a+2u-1\rangle$$

(i) Arc colorings

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

(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
$u = 0.500000 - 0.866025I$ $a = -0.888047 - 0.680493I$ $b = 0.176126 + 0.751194I$	$-2.02988I$	$3.46410I$
$u = 0.500000 + 0.866025I$ $a = -0.888047 + 0.680493I$ $b = 0.176126 - 0.751194I$	$2.02988I$	$-3.46410I$
$u = 0.500000 + 0.866025I$ $a = 0.420593 - 1.203216I$ $b = 1.49343 - 1.84400I$	$2.02988I$	$-3.46410I$
$u = 0.500000 - 0.866025I$ $a = 0.420593 + 1.203216I$ $b = 1.49343 + 1.84400I$	$-2.02988I$	$3.46410I$
$u = 0.500000 - 0.866025I$ $a = 0.467454 - 0.522723I$ $b = -0.669552 - 0.863143I$	$-2.02988I$	$3.46410I$
$u = 0.500000 + 0.866025I$ $a = 0.467454 + 0.522723I$ $b = -0.669552 + 0.863143I$	$2.02988I$	$-3.46410I$

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

(i) Arc colorings

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

(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
$u = -0.455090 - 1.098684I$ $a = -0.321797 + 0.776887I$ $b = -0.643594 + 0.553774I$	$-2.46740 + 3.66386I$	$-4.00000 - 4.00000I$
$u = -0.455090 + 1.098684I$ $a = -0.321797 - 0.776887I$ $b = -0.643594 - 0.553774I$	$-2.46740 - 3.66386I$	$-4.00000 + 4.00000I$
$u = 0.455090 - 1.098684I$ $a = 0.321797 + 0.776887I$ $b = 0.64359 + 2.55377I$	$-2.46740 - 3.66386I$	$-4.00000 + 4.00000I$
$u = 0.455090 + 1.098684I$ $a = 0.321797 - 0.776887I$ $b = 0.64359 - 2.55377I$	$-2.46740 + 3.66386I$	$-4.00000 - 4.00000I$

III. $I_3^u = \langle u^{23}+2u^{22}+\cdots+4u+2,\ -u^{22}-5u^{20}+\cdots+4a-2,\ -3u^{22}-4u^{21}+\cdots+4b-4\rangle$

(i) Arc colorings

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

$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$

$$a_6 = \begin{pmatrix}u\\u\end{pmatrix}$$

$$a_1 = \begin{pmatrix}u^2+1\\u^2\end{pmatrix}$$

$$a_3 = \begin{pmatrix}u^4+u^2+1\\u^4\end{pmatrix}$$

$$a_9 = \begin{pmatrix}\frac{1}{4}u^{22}+\frac{5}{4}u^{20}+\cdots-\frac{1}{2}u+\frac{1}{2}\\ \frac{3}{4}u^{22}+u^{21}+\cdots+\frac{5}{2}u+1\end{pmatrix}$$

$$a_8 = \begin{pmatrix}\frac{1}{4}u^{22}+\frac{5}{4}u^{20}+\cdots-\frac{1}{2}u+\frac{1}{2}\\ \frac{1}{4}u^{22}+u^{20}+\cdots-\frac{1}{2}u^4+u\end{pmatrix}$$

$$a_4 = \begin{pmatrix}-\frac{1}{4}u^{20}-\frac{5}{4}u^{18}+\cdots+\frac{1}{2}u+\frac{1}{2}\\ \frac{1}{4}u^{22}+u^{20}+\cdots+\frac{3}{2}u^4+u^2\end{pmatrix}$$

$$a_7 = \begin{pmatrix}-u^7-2u^5-2u^3\\-u^7-u^5+u\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}-\frac{1}{4}u^{22}-\frac{5}{4}u^{20}+\cdots+\frac{1}{2}u+\frac{1}{2}\\ \frac{1}{4}u^{22}+u^{21}+\cdots+\frac{5}{2}u+1\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}\frac{1}{2}u^{12}+\frac{3}{2}u^{10}+\cdots+u^2+1\\ -\frac{1}{4}u^{19}-u^{17}+\cdots+\frac{1}{2}u^2+\frac{1}{2}u\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}\frac{1}{2}u^{12}+\frac{3}{2}u^{10}+\cdots+u^2+1\\ -\frac{1}{4}u^{19}-u^{17}+\cdots+\frac{1}{2}u^2+\frac{1}{2}u\end{pmatrix}$$

(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
$u = -0.865908 - 0.562605I$ $a = -0.14897 + 1.44552I$ $b = -1.13136 + 1.17668I$	$12.26939 + 1.86843I$	$3.51927 - 2.09858I$
$u = -0.865908 + 0.562605I$ $a = -0.14897 - 1.44552I$ $b = -1.13136 - 1.17668I$	$12.26939 - 1.86843I$	$3.51927 + 2.09858I$
$u = -0.694097 - 1.072018I$ $a = 1.150630 - 0.034852I$ $b = 0.66479 + 1.28174I$	$10.72872 + 3.91001I$	$1.79235 - 2.50229I$
$u = -0.694097 + 1.072018I$ $a = 1.150630 + 0.034852I$ $b = 0.66479 - 1.28174I$	$10.72872 - 3.91001I$	$1.79235 + 2.50229I$
$u = -0.687410 - 0.551797I$ $a = -1.058189 - 0.292333I$ $b = 0.09563 - 1.43480I$	$2.63493 - 2.12803I$	$3.22069 + 2.55962I$
$u = -0.687410 + 0.551797I$ $a = -1.058189 + 0.292333I$ $b = 0.09563 + 1.43480I$	$2.63493 + 2.12803I$	$3.22069 - 2.55962I$
$u = -0.611535 - 1.029680I$ $a = -0.286245 - 0.892658I$ $b = 1.48846 - 1.69025I$	$1.22653 + 7.16348I$	$-0.15345 - 7.54828I$
$u = -0.611535 + 1.029680I$ $a = -0.286245 + 0.892658I$ $b = 1.48846 + 1.69025I$	$1.22653 - 7.16348I$	$-0.15345 + 7.54828I$
$u = -0.507450$ $a = 1.77335$ $b = -0.0446372$	-1.46388	-6.51989
$u = -0.439313 - 1.087584I$ $a = -0.269001 + 0.837240I$ $b = -0.63593 + 1.68262I$	$-4.16811 + 3.61856I$	$-9.97032 - 4.29272I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.439313+1.087584I$ $a=-0.269001-0.837240I$ $b=-0.63593-1.68262I$	$-4.16811-3.61856I$	$-9.97032+4.29272I$
$u=-0.126252-0.927958I$ $a=\quad 0.542530-0.805562I$ $b=-0.406418-0.391220I$	$-1.83455-1.28121I$	$-6.39377+3.70883I$
$u=-0.126252+0.927958I$ $a=\quad 0.542530+0.805562I$ $b=-0.406418+0.391220I$	$-1.83455+1.28121I$	$-6.39377-3.70883I$
$u=\quad 0.066964-1.228955I$ $a=-0.810310-0.760315I$ $b=-0.097050-1.114670I$	$5.54974+3.50228I$	$-1.93120-2.15966I$
$u=\quad 0.066964+1.228955I$ $a=-0.810310+0.760315I$ $b=-0.097050+1.114670I$	$5.54974-3.50228I$	$-1.93120+2.15966I$
$u=\quad 0.470162-1.125138I$ $a=-0.147107+0.216673I$ $b=-0.28619+1.38676I$	$-0.75408-3.78076I$	$1.64329+3.83078I$
$u=\quad 0.470162+1.125138I$ $a=-0.147107-0.216673I$ $b=-0.28619-1.38676I$	$-0.75408+3.78076I$	$1.64329-3.83078I$
$u=\quad 0.601530-0.285314I$ $a=-0.025582+0.683260I$ $b=\quad 0.827885+0.128170I$	$1.74084-0.44680I$	$5.28361+1.38333I$
$u=\quad 0.601530+0.285314I$ $a=-0.025582-0.683260I$ $b=\quad 0.827885-0.128170I$	$1.74084+0.44680I$	$5.28361-1.38333I$
$u=\quad 0.652491-1.132528I$ $a=\quad 0.173534-1.163911I$ $b=-1.35767-2.48887I$	$9.4833-11.7267I$	$0.34491+6.55767I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = \ \ 0.652491 + 1.132528I$ $a = \ \ 0.173534 + 1.163911I$ $b = -1.35767 + 2.48887I$	$9.4833 + 11.7267I$	$0.34491 - 6.55767I$
$u = \ \ 0.887093 - 0.448454I$ $a = \ \ 1.49204 - 0.39064I$ $b = -0.139833 - 1.361188I$	$11.55833 + 6.04378I$	$2.90457 - 2.40956I$
$u = \ \ 0.887093 + 0.448454I$ $a = \ \ 1.49204 + 0.39064I$ $b = -0.139833 + 1.361188I$	$11.55833 - 6.04378I$	$2.90457 + 2.40956I$

IV. $I_1^v = \langle b-1,\ v-1,\ a \rangle$

(i) Arc colorings

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

(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
$v =$	1.00000		
$a =$	0	0	0
$b =$	1.00000		

V. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_5	$(u)(u^2+u+1)^3(u^4+2u^2+2)(u^{23}-2u^{22}+\cdots+4u-2)$
c_2	$(u)(u^2+u+1)^3(2+2u+u^2)^2(u^{23}+10u^{22}+\cdots+8u-4)$
c_3	$(u-1)(u^4+4u^3+4u^2+1)(u^6-2u^4-u^3+u^2+u+1)$ $(u^{23}+27u^{21}+\cdots-7u+1)$
c_4	$(u-1)(u+1)^4(u^6-2u^4+\cdots+u+1)(u^{23}-2u^{22}+\cdots+9u+1)$
c_6	$(u)(u^2+u+1)^3(u^4-2u^2+2)(u^{23}-2u^{22}+\cdots-88u+16)$
c_7	$(u-1)(u+1)^4(u^6+4u^5+6u^4+3u^3-u^2-u+1)$ $(u^{23}+2u^{22}+\cdots-11u+1)$
c_8	$(u+1)^5(u^6-2u^4+\cdots-u+1)(u^{23}-2u^{22}+\cdots-3u-1)$
c_9	$(u+1)^5(u^6-2u^4+\cdots+u+1)(u^{23}-2u^{22}+\cdots+9u+1)$
c_{10}	$u^7(u^4-2u^2+2)(u^{23}+5u^{22}+\cdots+128u-1706)$
c_{11}	$(u-1)(u^4-4u^3+4u^2+1)(u^6-4u^5+6u^4-3u^3-u^2+u+1)$ $(u^{23}+8u^{22}+\cdots+1035u+297)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y)(y^2+y+1)^3(2+2y+y^2)^2(y^{23}+10y^{22}+\cdots+8y-4)$
c_2	$(y)(y^2+4)^2(y^2+y+1)^3(y^{23}+6y^{22}+\cdots+160y-16)$
c_3	$(y-1)(y^4-8y^3+\cdots+8y+1)(y^6-4y^5+\cdots+y+1)$ $(y^{23}+54y^{22}+\cdots+25y-1)$
c_4, c_9	$(y-1)^5(y^6-4y^5+6y^4-3y^3-y^2+y+1)$ $(y^{23}-34y^{22}+\cdots-27y-1)$
c_6	$(y)(2-2y+y^2)^2(y^2+y+1)^3(y^{23}+2y^{22}+\cdots+960y-256)$
c_7	$(y-1)^5(y^6-4y^5+10y^4-11y^3+19y^2-3y+1)$ $(y^{23}+46y^{22}+\cdots-135y-1)$
c_8	$(y-1)^5(y^6-4y^5+\cdots+y+1)(y^{23}-2y^{22}+\cdots-11y-1)$
c_{10}	$y^7(y^2-2y+2)^2(y^{23}+41y^{22}+\cdots-1.22873\times 10^7y-2910436)$
c_{11}	$(y-1)(y^4-8y^3+18y^2+8y+1)$ $(y^6-4y^5+10y^4-11y^3+19y^2-3y+1)$ $(y^{23}-26y^{22}+\cdots+935793y-88209)$