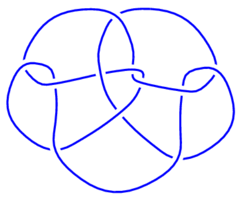
$11n_{84}$ ($K11n_{84}$)



[1]

Arc Sequences

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

6 1 10 7 2 9 11 4 6 1 8

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{5} I_i^u$$

$$I_1^u = \langle u^2 - u + 1,\ b,\ a - u \rangle$$
$$I_2^u = \langle u^9 - u^7 + 4u^5 - u^4 - 3u^3 - u^2 + u + 1,\ a + 1,\ u^8 + u^5 + 3u^4 - u^3 + 2u^2 + 2b + u + 1 \rangle$$
$$\begin{aligned} I_3^u = \langle & u^{14} + 2u^{13} - 4u^{11} + u^{10} + 12u^9 + 8u^8 - 13u^7 - 14u^6 + 11u^5 + 24u^4 + 8u^3 - 5u^2 - 3u + 1, \\ & - 3u^{13} - 3u^{12} + 2u^{11} + 7u^{10} - 10u^9 - 21u^8 - 3u^7 + 25u^6 + 7u^5 - 24u^4 - 30u^3 - 10u^2 + a - 2u, \\ & - 6u^{13} - 4u^{12} + 10u^{11} + 14u^{10} - 30u^9 - 42u^8 + 28u^7 + 70u^6 - 19u^5 - 84u^4 - 27u^3 + 34u^2 + b + 15u - 8 \rangle \end{aligned}$$
$$I_4^u = \langle u^4 - u^2 + 1,\ a + 1,\ b + u + 2 \rangle$$
$$I_5^u = \langle u^4 - u^2 + 1,\ u^2 + a - 1,\ -u^3 + b - 1 \rangle$$

There are 5 irreducible components with 33 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. $I_1^u = \langle u^2 - u + 1,\ b,\ a - u \rangle$

(i) Arc colorings

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

(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
$u =$	$0.500000 - 0.866025I$		
$a =$	$0.500000 - 0.866025I$	-3.28987	0
$b =$	0		
$u =$	$0.500000 + 0.866025I$		
$a =$	$0.500000 + 0.866025I$	-3.28987	0
$b =$	0		

II. $I_2^u =$
$\langle u^9 - u^7 + 4u^5 - u^4 - 3u^3 - u^2 + u + 1,\ a + 1,\ u^8 + u^5 + 3u^4 - u^3 + 2u^2 + 2b + u + 1\rangle$

(i) Arc colorings

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

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

$$a_9 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -1 \\ -\frac{1}{2}u^8 - \frac{1}{2}u^5 + \cdots - \frac{1}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -1 \\ -\frac{1}{2}u^8 - \frac{1}{2}u^5 + \cdots - \frac{1}{2}u - \frac{1}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u \\ -\frac{1}{2}u^7 - \frac{1}{2}u^6 + \cdots + u + \frac{1}{2} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{1}{2}u + 1 \\ -\frac{1}{2}u^8 - u^7 + \cdots + \frac{5}{2}u + \frac{3}{2} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -\frac{1}{2}u^8 - \frac{1}{2}u^5 + \cdots - \frac{1}{2}u + \frac{1}{2} \\ -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{3}{2}u + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^2 - 1 \\ \frac{1}{2}u^7 - \frac{1}{2}u^6 + \cdots - u - \frac{1}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{1}{2}u + 1 \\ -\frac{1}{2}u^8 - \frac{1}{2}u^5 + \cdots + \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{1}{2}u + 1 \\ -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{3}{2}u + 1 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{1}{2}u + 1 \\ -\frac{1}{2}u^8 - \frac{1}{2}u^7 + \cdots + \frac{3}{2}u + 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.080412-0.902403I$ $a=-1.00000$ $b=-2.53013-0.62959I$	$-11.3859+11.4316I$	$3.87498-6.27440I$
$u=-1.080412+0.902403I$ $a=-1.00000$ $b=-2.53013+0.62959I$	$-11.3859-11.4316I$	$3.87498+6.27440I$
$u=-0.691679$ $a=-1.00000$ $b=-1.08840$	1.19447	7.73921
$u=-0.390522-0.568670I$ $a=-1.00000$ $b=\ \ 0.285645-0.073214I$	$0.55350+1.83926I$	$2.90943-3.36389I$
$u=-0.390522+0.568670I$ $a=-1.00000$ $b=\ \ 0.285645+0.073214I$	$0.55350-1.83926I$	$2.90943+3.36389I$
$u=\ \ 0.871765-0.179703I$ $a=-1.00000$ $b=-2.15768+1.31941I$	$3.76690-2.81495I$	$13.8794+4.7349I$
$u=\ \ 0.871765+0.179703I$ $a=-1.00000$ $b=-2.15768-1.31941I$	$3.76690+2.81495I$	$13.8794-4.7349I$
$u=\ \ 0.945009-1.020791I$ $a=-1.00000$ $b=-1.55364+0.70869I$	$-12.44847-2.94293I$	$2.46663+2.24617I$
$u=\ \ 0.945009+1.020791I$ $a=-1.00000$ $b=-1.55364-0.70869I$	$-12.44847+2.94293I$	$2.46663-2.24617I$

III. $I^u_3 =$
$\langle u^{14}+2u^{13}+\cdots-3u+1,\ -3u^{13}-3u^{12}+\cdots+a-2u,\ -6u^{13}-4u^{12}+\cdots+b-8\rangle$

(i) Arc colorings

$$a_4 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_8 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}3u^{13}+3u^{12}+\cdots+10u^2+2u\\6u^{13}+4u^{12}+\cdots-15u+8\end{pmatrix}$$
$$a_1 = \begin{pmatrix}3u^{13}+3u^{12}+\cdots+10u^2+2u\\2u^{13}-u^{12}+\cdots-3u+5\end{pmatrix}$$
$$a_7 = \begin{pmatrix}-3u^{13}-5u^{12}+\cdots-7u+6\\-2u^{13}-2u^{12}+\cdots+7u-4\end{pmatrix}$$
$$a_5 = \begin{pmatrix}-5u^{13}-8u^{12}+\cdots+3u+3\\-u^{13}-2u^{12}+\cdots+11u-6\end{pmatrix}$$
$$a_6 = \begin{pmatrix}-u^{13}-4u^{12}+\cdots-5u+5\\-u^{12}+u^{11}+\cdots+9u-5\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}u^{13}-u^{12}+\cdots-12u+12\\6u^{13}+5u^{12}+\cdots-20u+8\end{pmatrix}$$
$$a_3 = \begin{pmatrix}-3u^{13}-6u^{12}+\cdots+6u-1\\-2u^{12}+2u^{11}+\cdots+17u-8\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-2u^{13}-2u^{12}+\cdots-7u+2\\u^{13}+3u^{12}+\cdots+18u^2-4\end{pmatrix}$$
$$a_2 = \begin{pmatrix}-2u^{13}-2u^{12}+\cdots-7u+2\\u^{13}+3u^{12}+\cdots+18u^2-4\end{pmatrix}$$

(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
$u = -0.959701 - 0.560232I$ $a = -0.491677 + 0.870777I$ $b = -1.33079$	-0.224468	2.93248
$u = -0.959701 + 0.560232I$ $a = -0.491677 - 0.870777I$ $b = -1.33079$	-0.224468	2.93248
$u = -0.923363 - 0.545351I$ $a = 0.293031 - 0.113910I$ $b = 1.12050 - 0.94164I$	$1.80997 + 2.06468I$	$8.36726 - 2.56334I$
$u = -0.923363 + 0.545351I$ $a = 0.293031 + 0.113910I$ $b = 1.12050 + 0.94164I$	$1.80997 - 2.06468I$	$8.36726 + 2.56334I$
$u = -0.854936 - 1.047654I$ $a = -0.068917 - 1.041912I$ $b = 0.562546 + 0.422571I$	$-12.15002 - 4.31290I$	$2.77263 + 1.98970I$
$u = -0.854936 + 1.047654I$ $a = -0.068917 + 1.041912I$ $b = 0.562546 - 0.422571I$	$-12.15002 + 4.31290I$	$2.77263 - 1.98970I$
$u = -0.742091 - 0.770818I$ $a = 1.053550 - 0.431908I$ $b = 1.98234 + 0.56738I$	$-1.06225 + 5.14002I$	$3.39387 - 6.24395I$
$u = -0.742091 + 0.770818I$ $a = 1.053550 + 0.431908I$ $b = 1.98234 - 0.56738I$	$-1.06225 - 5.14002I$	$3.39387 + 6.24395I$
$u = 0.332695 - 0.054624I$ $a = 2.96462 - 1.15244I$ $b = 1.12050 + 0.94164I$	$1.80997 - 2.06468I$	$8.36726 + 2.56334I$
$u = 0.332695 + 0.054624I$ $a = 2.96462 + 1.15244I$ $b = 1.12050 - 0.94164I$	$1.80997 + 2.06468I$	$8.36726 - 2.56334I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.032644 - 0.962970I$ $a = -0.063208 + 0.955593I$ $b = 0.562546 + 0.422571I$	$-12.15002 - 4.31290I$	$2.77263 + 1.98970I$
$u = 1.032644 + 0.962970I$ $a = -0.063208 - 0.955593I$ $b = 0.562546 - 0.422571I$	$-12.15002 + 4.31290I$	$2.77263 - 1.98970I$
$u = 1.114753 - 0.491580I$ $a = 0.812603 - 0.333131I$ $b = 1.98234 - 0.56738I$	$-1.06225 - 5.14002I$	$3.39387 + 6.24395I$
$u = 1.114753 + 0.491580I$ $a = 0.812603 + 0.333131I$ $b = 1.98234 + 0.56738I$	$-1.06225 + 5.14002I$	$3.39387 - 6.24395I$

IV. $I_4^u = \langle u^4 - u^2 + 1,\ a + 1,\ b + u + 2 \rangle$

(i) Arc colorings

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

(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
$u=-0.866025-0.500000I$ $a=-1.00000$ $b=-1.133975+0.500000I$	$1.64493+4.05977I$	$8.00000-6.92820I$
$u=-0.866025+0.500000I$ $a=-1.00000$ $b=-1.133975-0.500000I$	$1.64493-4.05977I$	$8.00000+6.92820I$
$u=\ \ 0.866025-0.500000I$ $a=-1.00000$ $b=-2.86603+0.50000I$	$1.64493-4.05977I$	$8.00000+6.92820I$
$u=\ \ 0.866025+0.500000I$ $a=-1.00000$ $b=-2.86603-0.50000I$	$1.64493+4.05977I$	$8.00000-6.92820I$

V. $\boldsymbol{I_5^u = \langle u^4 - u^2 + 1,\ u^2 + a - 1,\ -u^3 + b - 1\rangle}$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.866025 - 0.500000I$ $a = 0.500000 - 0.866025I$ $b = 1.00000 - 1.00000I$	1.64493	8.00000
$u = -0.866025 + 0.500000I$ $a = 0.500000 + 0.866025I$ $b = 1.00000 + 1.00000I$	1.64493	8.00000
$u = 0.866025 - 0.500000I$ $a = 0.500000 + 0.866025I$ $b = 1.00000 - 1.00000I$	1.64493	8.00000
$u = 0.866025 + 0.500000I$ $a = 0.500000 - 0.866025I$ $b = 1.00000 + 1.00000I$	1.64493	8.00000

VI. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_{10}	$(u^2-u+1)(u^2+u+1)^4$ $(u^9+2u^8+9u^7+14u^6+24u^5+27u^4+15u^3+5u^2+3u+1)$ $(u^{14}+4u^{13}+\cdots+19u+1)$
c_2	$(u^2+u+1)^5$ $(u^9+14u^8+73u^7+158u^6+76u^5-99u^4+71u^3+11u^2-u-1)$ $(u^{14}+20u^{13}+\cdots-119u+1)$
c_3	$(u^2+u+1)(u^4-4u^3+5u^2-2u+1)(u^4+2u^3+2u^2-2u+1)$ $(u^9+14u^7-26u^6+44u^5-169u^4+122u^3+114u^2-57u-31)$ $(u^{14}+2u^{13}+\cdots-325u+169)$
c_4	$(u^2+u+1)(u^4+2u^3+2u^2-2u+1)(u^4+2u^3+5u^2+4u+1)$ $(u^9+6u^7-6u^6+24u^5-19u^4+34u^3-20u^2+15u+1)$ $(u^{14}+2u^{13}+\cdots-35u+71)$
c_5	$(u^2-u+1)^5$ $(u^9+2u^8+9u^7+14u^6+24u^5+27u^4+15u^3+5u^2+3u+1)$ $(u^{14}+4u^{13}+\cdots+19u+1)$
c_6, c_9	$(u-1)^2(u^2+1)^4(u^7-u^6+u^5+u^4+2u^3+2u^2+u-1)^2$ $(u^9+5u^8+14u^7+25u^6+35u^5+39u^4+38u^3+27u^2+16u+4)$
c_7, c_8, c_{11}	$(u^2-u+1)(u^4-u^2+1)^2(u^9-u^7+4u^5-u^4-3u^3-u^2+u+1)$ $(u^{14}+2u^{13}+\cdots-3u+1)$

VII. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5, c_{10}	$(y^2+y+1)^5$ $(y^9+14y^8+73y^7+158y^6+76y^5-99y^4+71y^3+11y^2-y-1)$ $(y^{14}+20y^{13}+\cdots-119y+1)$
c_2	$(y^2+y+1)^5(y^9-50y^8+\cdots+23y-1)$ $(y^{14}-36y^{13}+\cdots-3183y+1)$
c_3	$(y^2+y+1)(y^4+14y^2+1)(y^4-6y^3+11y^2+6y+1)$ $(y^9+28y^8+\cdots+10317y-961)$ $(y^{14}+24y^{13}+\cdots+94809y+28561)$
c_4	$(y^2+y+1)(y^4+14y^2+1)(y^4+6y^3+11y^2-6y+1)$ $(y^9+12y^8+\cdots+265y-1)(y^{14}+12y^{13}+\cdots+15957y+5041)$
c_6, c_9	$(y-1)^2(y+1)^8(y^7+y^6+7y^5+9y^4+2y^2+5y-1)^2$ $(y^9+3y^8+\cdots+40y-16)$
c_7, c_8, c_{11}	$(y^2-y+1)^4(y^2+y+1)$ $(y^9-2y^8+9y^7-14y^6+24y^5-27y^4+15y^3-5y^2+3y-1)$ $(y^{14}-4y^{13}+\cdots-19y+1)$