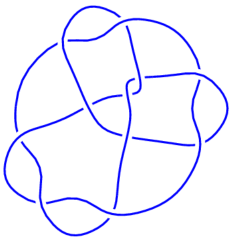
$11n_{169}$ ($K11n_{169}$)



[1]

Arc Sequences

5 8 1 9 1 4 11 2 4 7 8

Solving Sequence

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

Representation Ideals

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

$$\begin{aligned}
I_1^u = \langle & a^{12} + 10a^{10} + 6a^9 + 31a^8 + 12a^7 + 41a^6 - 15a^5 - 2a^4 + 15a^3 + 42a^2 + 21a + 7, \\
& -6317a^{11} + 39893u + \cdots - 215502a - 55601, \\
& 14803708a^{11} + 1043999981b + \cdots + 217594097a - 61454022\rangle \\
I_2^u = \langle & u^8 + u^7 + 2u^6 - u^5 + u^4 - 3u^3 + u^2 - 2u + 1,\ u^5 + u^4 + u^3 - u^2 + b - 1,\ u^7 + u^6 + 3u^5 + u^4 + 3u^3 - 3u^2 - \\
I_3^u = \langle & u^{13} - 8u^{12} + \cdots + 56u - 8, \\
& u^{12} - 6u^{11} + 18u^{10} - 38u^9 + 64u^8 - 91u^7 + 111u^6 - 114u^5 + 100u^4 - 77u^3 + 51u^2 + 8a - 28u + 12, \\
& -u^{12} + 8u^{11} + \cdots + 4b - 12\rangle
\end{aligned}$$

There are 3 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. $\boldsymbol{I_1^u = \langle a^{12} + 10a^{10} + \cdots + 21a + 7,\ -6317a^{11} + 39893u + \cdots - 215502a - 55601,\ 1.04 \times 10^8 b + 1.48 \times 10^7 a^{11} + \cdots + 2.18 \times 10^8 a - 6.15 \times 10^7\rangle}$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} a \\ -0.141798a^{11} + 0.138802a^{10} + \cdots - 2.08424a + 0.588640 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0.138802a^{11} - 0.0483084a^{10} + \cdots + 3.56640a + 1.99259 \\ 0.199814a^{11} - 0.100324a^{10} + \cdots + 3.55063a + 1.75075 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0 \\ 0.158349a^{11} - 0.0264207a^{10} + \cdots + 5.40200a + 1.39375 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.141798a^{11} - 0.138802a^{10} + \cdots + 3.08424a - 0.588640 \\ -0.141798a^{11} + 0.138802a^{10} + \cdots - 2.08424a + 0.588640 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ 0.158349a^{11} - 0.0264207a^{10} + \cdots + 5.40200a + 2.39375 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.158349a^{11} + 0.0264207a^{10} + \cdots - 5.40200a - 1.39375 \\ 0.158349a^{11} - 0.0264207a^{10} + \cdots + 5.40200a + 2.39375 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.146210a^{11} + 0.0393344a^{10} + \cdots + 6.68400a + 2.97987 \\ 0.0703822a^{11} - 0.0839361a^{10} + \cdots + 0.464569a - 0.752853 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.0135540a^{11} - 0.0157206a^{10} + \cdots - 0.766309a - 0.245528 \\ -0.0448347a^{11} + 0.160873a^{10} + \cdots + 1.31433a + 2.06632 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -0.170487a^{11} + 0.0921758a^{10} + \cdots - 4.12000a + 0.192359 \\ 0.00740795a^{11} + 0.0876429a^{10} + \cdots + 3.11760a + 0.987279 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.0314412a^{11} + 0.102271a^{10} + \cdots + 0.0782103a + 2.18976 \\ 0.241434a^{11} - 0.158751a^{10} + \cdots + 5.92854a + 1.42744 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.0314412a^{11} + 0.102271a^{10} + \cdots + 0.0782103a + 2.18976 \\ 0.241434a^{11} - 0.158751a^{10} + \cdots + 5.92854a + 1.42744 \end{pmatrix}$$

(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
$u = -0.500000 + 0.866025I$ $a = -0.86942 - 1.28287I$ $b = 0.231240 - 1.394375I$	$4.22983 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -0.86942 + 1.28287I$ $b = 0.231240 + 1.394375I$	$4.22983 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -0.519247 - 0.520638I$ $b = -1.61068 - 0.71000I$	$-12.68949 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -0.519247 + 0.520638I$ $b = -1.61068 + 0.71000I$	$-12.68949 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -0.281671 - 0.395754I$ $b = 0.763411 + 0.046058I$	$-1.40994 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -0.281671 + 0.395754I$ $b = 0.763411 - 0.046058I$	$-1.40994 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = 0.28167 - 1.76408I$ $b = -0.139922 - 1.125974I$	$-1.40994 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 + 0.866025I$ $a = 0.28167 + 1.76408I$ $b = -0.139922 + 1.125974I$	$-1.40994 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = 0.51925 - 2.60041I$ $b = 0.709707 - 0.850523I$	$-12.68949 + 2.02988I$	$-12.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = 0.51925 + 2.60041I$ $b = 0.709707 + 0.850523I$	$-12.68949 - 2.02988I$	$-12.00000 + 3.46410I$

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 - 0.866025I$ $a = 0.869423 - 0.512030I$ $b = -0.453761 - 1.008958I$	$4.22983 - 2.02988I$	$-12.00000 + 3.46410I$
$u = -0.500000 + 0.866025I$ $a = 0.869423 + 0.512030I$ $b = -0.453761 + 1.008958I$	$4.22983 + 2.02988I$	$-12.00000 - 3.46410I$

II. $I_2^u = \langle u^8 + u^7 + 2u^6 - u^5 + u^4 - 3u^3 + u^2 - 2u + 1,\ u^5 + u^4 + u^3 - u^2 + b - 1,\ u^7 + u^6 + 3u^5 + u^4 + 3u^3 - 3u^2 + a - 3\rangle$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} -u^7 - u^6 - 3u^5 - u^4 - 3u^3 + 3u^2 + 3 \\ -u^5 - u^4 - u^3 + u^2 + 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -2u^7 - 3u^6 - 5u^5 - u^3 + 5u^2 + u + 3 \\ -u^7 - u^6 - 2u^5 + u^4 - u^3 + 3u^2 - u + 1 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -u^7 - u^6 - 2u^5 - 2u^3 + 2u^2 + 2 \\ -u^5 - u^4 - u^3 + u^2 + 1 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^7 - 2u^6 - 3u^5 - u^4 + 2u^2 + 2u + 1 \\ -u^7 - u^6 - 2u^5 + u^4 - u^3 + 3u^2 + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -2u^7 - 3u^6 - 5u^5 - 2u^3 + 4u^2 + 4 \\ -u^7 - 2u^6 - 3u^5 - u^4 - u^3 + 2u^2 + u + 2 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 3u^7 + 4u^6 + 7u^5 - u^4 + 2u^3 - 7u^2 + u - 4 \\ u^7 + u^6 + 2u^5 - u^4 + u^3 - 3u^2 + u - 2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^7 + 2u^6 + 4u^5 + 2u^4 + 2u^3 - 3u^2 - 2u - 4 \\ u^7 + 2u^6 + 3u^5 + u^4 + u^3 - 2u^2 - u - 2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^7 + 2u^6 + 4u^5 + 2u^4 + 2u^3 - 3u^2 - 2u - 4 \\ u^7 + 2u^6 + 3u^5 + u^4 + u^3 - 2u^2 - u - 2 \end{pmatrix}$$

(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
$u = -0.95744 - 1.12705I$ $a = 0.508528 - 0.793604I$ $b = -0.211625 - 1.217615I$	$1.24083 - 3.75870I$	$-10.69968 + 3.38204I$
$u = -0.95744 + 1.12705I$ $a = 0.508528 + 0.793604I$ $b = -0.211625 + 1.217615I$	$1.24083 + 3.75870I$	$-10.69968 - 3.38204I$
$u = -0.404913 - 1.017878I$ $a = -0.792580 + 1.098412I$ $b = 0.350924 + 1.208539I$	$5.21920 - 1.77211I$	$-2.23409 + 0.85548I$
$u = -0.404913 + 1.017878I$ $a = -0.792580 - 1.098412I$ $b = 0.350924 - 1.208539I$	$5.21920 + 1.77211I$	$-2.23409 - 0.85548I$
$u = 0.163169 - 0.915412I$ $a = 0.48888 - 1.77230I$ $b = -0.511162 - 1.035647I$	$-0.155635 + 0.787051I$	$-8.59786 + 1.33483I$
$u = 0.163169 + 0.915412I$ $a = 0.48888 + 1.77230I$ $b = -0.511162 + 1.035647I$	$-0.155635 - 0.787051I$	$-8.59786 - 1.33483I$
$u = 0.479751$ $a = 3.21196$ $b = 1.04135$	-12.9150	-12.7749
$u = 0.918626$ $a = -0.621620$ $b = -0.297628$	-2.98361	-12.1618

III. $I_3^u = \langle u^{13}-8u^{12}+\cdots+56u-8,\ u^{12}-6u^{11}+\cdots+8a+12,\ -u^{12}+8u^{11}+\cdots+4b-12\rangle$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} -\frac{1}{8}u^{12}+\frac{3}{4}u^{11}+\cdots+\frac{7}{2}u-\frac{3}{2} \\ \frac{1}{4}u^{12}-2u^{11}+\cdots-\frac{33}{2}u+3 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -\frac{1}{4}u^{12}+\frac{3}{2}u^{11}+\cdots+\frac{3}{2}u+\frac{1}{2} \\ -\frac{1}{2}u^{11}+3u^{10}+\cdots-\frac{23}{2}u+2 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} -\frac{3}{8}u^{12}+\frac{11}{4}u^{11}+\cdots+20u-\frac{9}{2} \\ \frac{1}{4}u^{12}-2u^{11}+\cdots-\frac{33}{2}u+3 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -u \\ u^3+u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{4}u^{12}-2u^{11}+\cdots-13u+\frac{5}{2} \\ \frac{1}{2}u^{11}-3u^{10}+\cdots+\frac{25}{2}u-2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{1}{4}u^{12}-\frac{5}{4}u^{11}+\cdots+\frac{55}{4}u-4 \\ -\frac{3}{4}u^{12}+\frac{11}{2}u^{11}+\cdots+29u-4 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{1}{4}u^{12}-2u^{11}+\cdots-14u+\frac{7}{2} \\ \frac{1}{2}u^{12}-\frac{7}{2}u^{11}+\cdots-\frac{29}{2}u+2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^{12}-\frac{27}{4}u^{11}+\cdots-\frac{73}{4}u+2 \\ -\frac{3}{4}u^{12}+\frac{11}{2}u^{11}+\cdots+29u-4 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^{12}-\frac{27}{4}u^{11}+\cdots-\frac{73}{4}u+2 \\ -\frac{3}{4}u^{12}+\frac{11}{2}u^{11}+\cdots+29u-4 \end{pmatrix}$$

(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
$u=-0.326542-1.020095I$ $a=-0.174135-1.155087I$ $b=\ \ 0.329129-0.671341I$	$-1.07131-1.81105I$	$-12.48073+2.50977I$
$u=-0.326542+1.020095I$ $a=-0.174135+1.155087I$ $b=\ \ 0.329129+0.671341I$	$-1.07131+1.81105I$	$-12.48073-2.50977I$
$u=\ \ 0.270743-1.206069I$ $a=\ \ 0.134462+1.126172I$ $b=-0.598666+0.794370I$	$2.89440+2.21633I$	$-9.35734-3.25180I$
$u=\ \ 0.270743+1.206069I$ $a=\ \ 0.134462-1.126172I$ $b=-0.598666-0.794370I$	$2.89440-2.21633I$	$-9.35734+3.25180I$
$u=\ \ 0.325158$ $a=-0.805865$ $b=\ \ 0.388289$	-0.575325	-17.2598
$u=\ \ 0.63465-1.27236I$ $a=-0.131915-1.240229I$ $b=\ \ 0.796089-1.077434I$	$-0.15730+7.29804I$	$-11.37128-6.48312I$
$u=\ \ 0.63465+1.27236I$ $a=-0.131915+1.240229I$ $b=\ \ 0.796089+1.077434I$	$-0.15730-7.29804I$	$-11.37128+6.48312I$
$u=\ \ 0.83155-1.23498I$ $a=\ \ 0.21318+1.40057I$ $b=-0.92331+1.41816I$	$-10.0617+10.8173I$	$-12.24076-5.20880I$
$u=\ \ 0.83155+1.23498I$ $a=\ \ 0.21318-1.40057I$ $b=-0.92331-1.41816I$	$-10.0617-10.8173I$	$-12.24076+5.20880I$
$u=\ \ 1.161483-0.385396I$ $a=-0.259148-0.010479I$ $b=-0.475687-0.592166I$	$-3.17225-0.94602I$	$-12.22572+6.14642I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.161483+0.385396I$ $a = -0.259148+0.010479I$ $b = -0.475687+0.592166I$	$-3.17225+0.94602I$	$-12.22572-6.14642I$
$u = 1.26554-0.69993I$ $a = 0.620492+0.189125I$ $b = 0.678296+1.053703I$	$-11.99574-3.34885I$	$-12.69425+2.28469I$
$u = 1.26554+0.69993I$ $a = 0.620492-0.189125I$ $b = 0.678296-1.053703I$	$-11.99574+3.34885I$	$-12.69425-2.28469I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2-u+1)^6(u^8+u^7+2u^6-u^5+u^4-3u^3+u^2-2u+1)$ $(u^{13}+8u^{12}+\cdots+56u+8)$
c_2, c_9	$(u^8+3u^6+\cdots-3u-1)(u^{12}+u^{11}+\cdots-14u+7)$ $(u^{13}+3u^{11}+\cdots+2u-1)$
c_3, c_6	$(u^8+2u^7+\cdots-u+1)(u^{12}+u^{11}+\cdots+56u+13)$ $(u^{13}+2u^{12}+\cdots-4u-1)$
c_4, c_8	$(u^8+3u^6+\cdots+3u-1)(u^{12}+u^{11}+\cdots-14u+7)$ $(u^{13}+3u^{11}+\cdots+2u-1)$
c_5	$(u^2-u+1)^6(u^8-u^7+2u^6+u^5+u^4+3u^3+u^2+2u+1)$ $(u^{13}+8u^{12}+\cdots+56u+8)$
c_7	$(u^3-u^2-2u+1)^4(u^8+u^7-5u^6-4u^5+8u^4+5u^3-3u^2-u-1)$ $(u^{13}+6u^{12}+\cdots+14u+4)$
c_{10}, c_{11}	$(u^3-u^2-2u+1)^4(u^8-u^7-5u^6+4u^5+8u^4-5u^3-3u^2+u-1)$ $(u^{13}+6u^{12}+\cdots+14u+4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^2+y+1)^6(y^8+3y^7+8y^6+11y^5+5y^4-7y^3-9y^2-2y+1)$ $(y^{13}+4y^{12}+\cdots+480y-64)$
c_2, c_4, c_8 c_9	$(y^8+6y^7+15y^6+17y^5+y^4-21y^3-24y^2-9y+1)$ $(y^{12}+3y^{11}+\cdots-140y^2+49)(y^{13}+6y^{12}+\cdots+2y-1)$
c_3, c_6	$(y^8-2y^7-9y^6-7y^5+5y^4+11y^3+8y^2+3y+1)$ $(y^{12}-13y^{11}+\cdots-432y+169)(y^{13}-26y^{12}+\cdots+42y-1)$
c_7, c_{10}, c_{11}	$(y^3-5y^2+6y-1)^4$ $(y^8-11y^7+49y^6-112y^5+134y^4-71y^3+3y^2+5y+1)$ $(y^{13}-16y^{12}+\cdots+204y-16)$