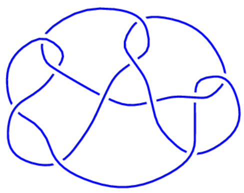
$11n_3$ ($K11n_3$)



[1]

Arc Sequences

$$\rightarrow \uparrow_{5} \rightarrow \downarrow_{1} \rightarrow \downarrow_{8} \rightarrow \uparrow_{2} \rightarrow \downarrow_{3} \rightarrow \uparrow_{9} \rightarrow \uparrow_{11} \rightarrow \downarrow_{3} \rightarrow \uparrow_{1} \rightarrow \uparrow_{7} \rightarrow \uparrow_{10} \rightarrow$$

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle a^6 - a^5 - a^4 + 3a^2 - 2a + 1,\ -a^5 - a^4 - a^3 + 3a^2 + 5b - 2a - 2,\ 2a^5 - 3a^4 - 3a^3 - a^2 + 9a + 5u - 1\rangle$$
$$I_2^u = \langle u^{27} - 4u^{26} + \cdots + 4u - 1,\ -2u^{26} + 9u^{25} + \cdots + 4b + 5,\ -11u^{26} + 43u^{25} + \cdots + 4a - 20\rangle$$

There are 2 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. $\boldsymbol{I_1^u = \langle a^6 - a^5 - a^4 + 3a^2 - 2a + 1,\ -a^5 - a^4 - a^3 + 3a^2 + 5b - 2a - 2,\ 2a^5 - 3a^4 - 3a^3 - a^2 + 9a + 5u - 1\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \cdots - \frac{9}{5}a + \frac{1}{5} \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \cdots - \frac{9}{5}a + \frac{6}{5} \end{pmatrix}$$
$$a_3 = \begin{pmatrix} \frac{2}{5}a^5 - \frac{3}{5}a^4 + \cdots + \frac{9}{5}a - \frac{1}{5} \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \cdots - \frac{9}{5}a + \frac{6}{5} \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} \frac{2}{5}a^5 - \frac{3}{5}a^4 + \cdots + \frac{9}{5}a - \frac{1}{5} \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \cdots - \frac{9}{5}a + \frac{6}{5} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \cdots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \cdots + \frac{3}{5}a - \frac{2}{5} \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \cdots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \cdots + \frac{3}{5}a - \frac{2}{5} \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \cdots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} \frac{2}{5}a^5 + \frac{2}{5}a^4 + \cdots + \frac{4}{5}a + \frac{4}{5} \\ \frac{2}{5}a^5 + \frac{2}{5}a^4 + \cdots + \frac{4}{5}a - \frac{1}{5} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a^2 - 1 \\ \frac{2}{5}a^5 + \frac{2}{5}a^4 + \cdots + \frac{4}{5}a - \frac{1}{5} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} a^2 - 1 \\ \frac{2}{5}a^5 + \frac{2}{5}a^4 + \cdots + \frac{4}{5}a - \frac{1}{5} \end{pmatrix}$$

(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
$u = -0.500000 + 0.866025I$ $a = -1.024478 - 0.839835I$ $b = 0.215080 - 1.307141I$	$-3.02413 - 4.85801I$	$0.94625 + 7.60556I$
$u = -0.500000 - 0.866025I$ $a = -1.024478 + 0.839835I$ $b = 0.215080 + 1.307141I$	$-3.02413 + 4.85801I$	$0.94625 - 7.60556I$
$u = -0.500000 + 0.866025I$ $a = 0.284920 - 0.493496I$ $b = 0.569840$	$1.11345 - 2.02988I$	$5.31735 + 5.84990I$
$u = -0.500000 - 0.866025I$ $a = 0.284920 + 0.493496I$ $b = 0.569840$	$1.11345 + 2.02988I$	$5.31735 - 5.84990I$
$u = -0.500000 - 0.866025I$ $a = 1.239557 - 0.467306I$ $b = 0.215080 - 1.307141I$	$-3.02413 - 0.79824I$	$2.23639 - 1.26697I$
$u = -0.500000 + 0.866025I$ $a = 1.239557 + 0.467306I$ $b = 0.215080 + 1.307141I$	$-3.02413 + 0.79824I$	$2.23639 + 1.26697I$

II. $I_2^u = \langle u^{27} - 4u^{26} + \cdots + 4u - 1,\ -2u^{26} + 9u^{25} + \cdots + 4b + 5,\ -11u^{26} + 43u^{25} + \cdots + 4a - 20\rangle$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^2 + 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^5 - 2u^3 - u \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{11}{4}u^{26} - \frac{43}{4}u^{25} + \cdots - \frac{59}{4}u + 5 \\ \frac{1}{2}u^{26} - \frac{9}{4}u^{25} + \cdots - \frac{1}{4}u - \frac{5}{4} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{9}{4}u^{26} - \frac{17}{2}u^{25} + \cdots - \frac{29}{2}u + \frac{25}{4} \\ \frac{1}{2}u^{26} - \frac{9}{4}u^{25} + \cdots - \frac{1}{4}u - \frac{5}{4} \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{7}{4}u^{26} - \frac{17}{2}u^{25} + \cdots - \frac{29}{2}u + \frac{23}{4} \\ \frac{3}{2}u^{26} - \frac{15}{4}u^{25} + \cdots + \frac{5}{4}u - \frac{7}{4} \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} \frac{1}{4}u^{25} - \frac{3}{4}u^{24} + \cdots - \frac{5}{4}u - \frac{1}{4} \\ -\frac{1}{4}u^{26} + u^{25} + \cdots + 2u - \frac{1}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -\frac{1}{4}u^{26} + \frac{3}{4}u^{25} + \cdots + \frac{9}{4}u + 1 \\ \frac{1}{4}u^{26} - u^{25} + \cdots - u + \frac{1}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -\frac{1}{4}u^{26} + \frac{3}{4}u^{25} + \cdots + \frac{9}{4}u + 1 \\ \frac{1}{4}u^{26} - u^{25} + \cdots - u + \frac{1}{4} \end{pmatrix}$$

(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
$u = -0.788466 - 0.735549I$ $a = 1.072263 + 0.437821I$ $b = -0.734777 - 0.901872I$	$1.69325 + 4.38642I$	$5.48340 - 6.16823I$
$u = -0.788466 + 0.735549I$ $a = 1.072263 - 0.437821I$ $b = -0.734777 + 0.901872I$	$1.69325 - 4.38642I$	$5.48340 + 6.16823I$
$u = -0.745773 - 0.297829I$ $a = 0.604621 + 0.049173I$ $b = -0.773747 + 0.765461I$	$2.07980 - 1.34949I$	$7.85827 + 1.99966I$
$u = -0.745773 + 0.297829I$ $a = 0.604621 - 0.049173I$ $b = -0.773747 - 0.765461I$	$2.07980 + 1.34949I$	$7.85827 - 1.99966I$
$u = -0.644510 - 0.944883I$ $a = -0.533488 - 0.942713I$ $b = -0.576735 + 0.597389I$	$0.942185 + 1.033983I$	$3.86006 + 2.18156I$
$u = -0.644510 + 0.944883I$ $a = -0.533488 + 0.942713I$ $b = -0.576735 - 0.597389I$	$0.942185 - 1.033983I$	$3.86006 - 2.18156I$
$u = -0.416547 - 0.666005I$ $a = -0.921185 - 0.142035I$ $b = 0.1203247 - 0.0139344I$	$-0.075638 + 1.377023I$	$-0.36727 - 4.75192I$
$u = -0.416547 + 0.666005I$ $a = -0.921185 + 0.142035I$ $b = 0.1203247 + 0.0139344I$	$-0.075638 - 1.377023I$	$-0.36727 + 4.75192I$
$u = -0.414628 - 1.117411I$ $a = 0.66245 - 1.50552I$ $b = -0.597009 - 1.097155I$	$-0.68885 + 5.76088I$	$3.34925 - 6.52520I$
$u = -0.414628 + 1.117411I$ $a = 0.66245 + 1.50552I$ $b = -0.597009 + 1.097155I$	$-0.68885 - 5.76088I$	$3.34925 + 6.52520I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.306051 - 1.029994I$ $a = -1.06837 + 1.05905I$ $b = -0.142139 + 0.786060I$	$-1.54191 + 1.16661I$	$0.74423 - 1.49202I$
$u = -0.306051 + 1.029994I$ $a = -1.06837 - 1.05905I$ $b = -0.142139 - 0.786060I$	$-1.54191 - 1.16661I$	$0.74423 + 1.49202I$
$u = 0.218742 - 0.648641I$ $a = -2.13794 - 0.51786I$ $b = -0.114018 - 1.229171I$	$-3.44772 + 1.77523I$	$-1.86458 - 4.75426I$
$u = 0.218742 + 0.648641I$ $a = -2.13794 + 0.51786I$ $b = -0.114018 + 1.229171I$	$-3.44772 - 1.77523I$	$-1.86458 + 4.75426I$
$u = 0.288020$ $a = 2.30249$ $b = -0.751267$	1.43125	6.84046
$u = 0.316767 - 0.586595I$ $a = 2.03428 + 0.72459I$ $b = -0.308260 + 1.360574I$	$-3.14099 - 3.86941I$	$0.026459 + 0.626604I$
$u = 0.316767 + 0.586595I$ $a = 2.03428 - 0.72459I$ $b = -0.308260 - 1.360574I$	$-3.14099 + 3.86941I$	$0.026459 - 0.626604I$
$u = 0.871119 - 1.001680I$ $a = -1.50386 - 0.29174I$ $b = 0.561234 - 0.960206I$	$6.79111 - 5.64536I$	$3.12437 + 2.66728I$
$u = 0.871119 + 1.001680I$ $a = -1.50386 + 0.29174I$ $b = 0.561234 + 0.960206I$	$6.79111 + 5.64536I$	$3.12437 - 2.66728I$
$u = 0.874810 - 1.047291I$ $a = 1.75555 + 0.41216I$ $b = -0.77158 + 1.54764I$	$8.6132 - 11.5634I$	$4.87720 + 6.78953I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.874810 + 1.047291I$ $a = 1.75555 - 0.41216I$ $b = -0.77158 - 1.54764I$	$8.6132 + 11.5634I$	$4.87720 - 6.78953I$
$u = 0.936568 - 0.868550I$ $a = -0.622741 - 0.432123I$ $b = 0.615354 + 0.828835I$	$7.22245 - 1.02048I$	$3.69178 + 1.94630I$
$u = 0.936568 + 0.868550I$ $a = -0.622741 + 0.432123I$ $b = 0.615354 - 0.828835I$	$7.22245 + 1.02048I$	$3.69178 - 1.94630I$
$u = 0.963184 - 0.968511I$ $a = 1.132979 + 0.748394I$ $b = -1.54394 + 0.07346I$	$13.47883 - 3.52700I$	$8.35802 + 2.34346I$
$u = 0.963184 + 0.968511I$ $a = 1.132979 - 0.748394I$ $b = -1.54394 - 0.07346I$	$13.47883 + 3.52700I$	$8.35802 - 2.34346I$
$u = 0.990777 - 0.836466I$ $a = 0.374202 + 0.676327I$ $b = -0.85907 - 1.48785I$	$9.30444 + 4.72653I$	$5.93859 - 2.37138I$
$u = 0.990777 + 0.836466I$ $a = 0.374202 - 0.676327I$ $b = -0.85907 + 1.48785I$	$9.30444 - 4.72653I$	$5.93859 + 2.37138I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2+u+1)^3(u^{27}+4u^{26}+\cdots+4u+1)$
c_2	$(u^2+u+1)^3(u^{27}+6u^{26}+\cdots+4u-1)$
c_3, c_8	$u^6(u^{27}+u^{26}+\cdots-32u+64)$
c_4	$(u^2-u+1)^3(u^{27}+4u^{26}+\cdots+4u+1)$
c_5	$(u^2+u+1)^3(u^{27}+4u^{26}+\cdots+6988u-1153)$
c_6	$(u^3+u^2+2u+1)^2(u^{27}+3u^{26}+\cdots-u-1)$
c_7	$(u^3-u^2+1)^2(u^{27}+3u^{26}+\cdots+3u+1)$
c_9	$(u^3+u^2+2u+1)^2(u^{27}+11u^{26}+\cdots-9u+1)$
c_{10}	$(u^3+u^2-1)^2(u^{27}+3u^{26}+\cdots+3u+1)$
c_{11}	$(u^3-u^2+2u-1)^2(u^{27}+11u^{26}+\cdots-9u+1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y^2+y+1)^3(y^{27}+6y^{26}+\cdots+4y-1)$
c_2	$(y^2+y+1)^3(y^{27}+34y^{26}+\cdots+136y-1)$
c_3, c_8	$y^6(y^{27}+35y^{26}+\cdots+1024y-4096)$
c_5	$(y^2+y+1)^3(y^{27}+62y^{26}+\cdots-7660244y-1329409)$
c_6	$(y^3+3y^2+2y-1)^2(y^{27}-47y^{26}+\cdots-9y-1)$
c_7, c_{10}	$(y^3-y^2+2y-1)^2(y^{27}-11y^{26}+\cdots-9y-1)$
c_9, c_{11}	$(y^3+3y^2+2y-1)^2(y^{27}+13y^{26}+\cdots+127y-1)$