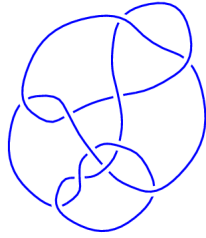
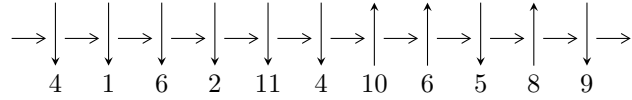


11n₄₀ (K11n₄₀)

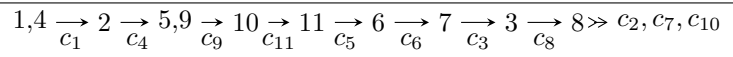


1

Arc Sequences



Solving Sequence



Representation Ideals

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

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

$$I_2^u = \langle u^2 + u - 1, b, a - 3u - 5 \rangle$$

$$I_3^u = \langle u^{47} + 8u^{46} + \dots + 7u + 1, 1.86673 \times 10^{35}u^{46} - 1.48910 \times 10^{36}u^{45} + \dots + 4.27377 \times 10^{36}a + 1.07223 \times 10^{37} \\ 8.07539 \times 10^{36}u^{46} + 6.00242 \times 10^{37}u^{45} + \dots + 8.54755 \times 10^{36}b + 1.34031 \times 10^{37} \rangle$$

There are 3 irreducible components with 55 representations.

¹The knot diagram image is adapter from “C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, <http://www.indiana.edu/~knotinfo>”

$$\text{I. } I_1^u = \langle b^6 - b^5 - b^4 + 2b^3 - b + 1, u - 1, -b^4 + 2b^2 - b + a - 2 \rangle$$

(i) Arc colorings

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

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

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

$$a_5 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} b^4 - 2b^2 + b + 2 \\ b \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} b^4 - 2b^2 + 2 \\ b \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -b^5 + 2b^3 - b^2 - 2b + 1 \\ -b^2 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ -b^4 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0 \\ -b^4 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

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

(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
$u = 1.00000$ $a = -0.346225 - 0.393823I$ $b = -1.002193 - 0.295542I$	$-3.53554 - 0.92430I$	$-13.12292 + 1.33143I$
$u = 1.00000$ $a = -0.346225 + 0.393823I$ $b = -1.002193 + 0.295542I$	$-3.53554 + 0.92430I$	$-13.12292 - 1.33143I$
$u = 1.00000$ $a = 2.68739 + 0.76772I$ $b = 0.428243 - 0.664531I$	$0.245672 - 0.924305I$	$-5.17126 + 7.13914I$
$u = 1.00000$ $a = 2.68739 - 0.76772I$ $b = 0.428243 + 0.664531I$	$0.245672 + 0.924305I$	$-5.17126 - 7.13914I$
$u = 1.00000$ $a = 0.658836 - 0.177500I$ $b = 1.073950 - 0.558752I$	$-1.64493 + 5.69302I$	$-11.70582 - 2.69056I$
$u = 1.00000$ $a = 0.658836 + 0.177500I$ $b = 1.073950 + 0.558752I$	$-1.64493 - 5.69302I$	$-11.70582 + 2.69056I$

$$\text{II. } I_2^u = \langle u^2 + u - 1, b, a - 3u - 5 \rangle$$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ -u + 1 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} 3u + 5 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 2u + 4 \\ 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -1 \\ -u + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ -u + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 2u + 3 \\ 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 2u + 3 \\ 1 \end{pmatrix}$$

(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
$u = -1.61803$ $a = 0.145898$ $b = 0$	-7.23771	41.0000
$u = 0.618034$ $a = 6.85410$ $b = 0$	0.657974	41.0000

$$\text{III. } I_3^u = \langle u^{47} + 8u^{46} + \dots + 7u + 1, 1.87 \times 10^{35}u^{46} - 1.49 \times 10^{36}u^{45} + \dots + 4.27 \times 10^{36}a + 1.07 \times 10^{37}, 8.08 \times 10^{36}u^{46} + 6.00 \times 10^{37}u^{45} + \dots + 8.55 \times 10^{36}b + 1.34 \times 10^{37} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ u^2 \end{pmatrix} \\ a_5 &= \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix} \\ a_9 &= \begin{pmatrix} -0.0436786u^{46} + 0.348428u^{45} + \dots - 27.9405u - 2.50886 \\ -0.944761u^{46} - 7.02239u^{45} + \dots - 8.76360u - 1.56807 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 0.183235u^{46} + 2.58132u^{45} + \dots - 20.0808u - 1.19485 \\ -2.50742u^{46} - 18.7010u^{45} + \dots - 19.7734u - 3.29966 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -1.08058u^{46} - 8.14247u^{45} + \dots - 9.68656u + 1.51066 \\ -0.508743u^{46} - 3.94324u^{45} + \dots - 9.53527u - 1.05799 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0.377639u^{46} + 2.54848u^{45} + \dots - 12.1966u - 0.249306 \\ 0.653298u^{46} + 5.04572u^{45} + \dots + 6.43493u + 1.03094 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 0.377639u^{46} + 2.54848u^{45} + \dots - 12.1966u - 0.249306 \\ 1.15585u^{46} + 8.72441u^{45} + \dots + 9.36570u + 1.50357 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -u^2 + 1 \\ u^2 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.334510u^{46} - 1.43080u^{45} + \dots - 34.1017u - 1.22443 \\ -1.47305u^{46} - 11.2678u^{45} + \dots - 14.9627u - 2.38719 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.334510u^{46} - 1.43080u^{45} + \dots - 34.1017u - 1.22443 \\ -1.47305u^{46} - 11.2678u^{45} + \dots - 14.9627u - 2.38719 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.59066$ $a = -0.00631231$ $b = 0.284188$	-7.32077	-55.5530
$u = -1.25537 - 0.82211I$ $a = 0.569872 - 0.706242I$ $b = 0.530975 + 1.012180I$	$7.53187 - 7.19737I$	$-1.29280 + 5.42764I$
$u = -1.25537 + 0.82211I$ $a = 0.569872 + 0.706242I$ $b = 0.530975 - 1.012180I$	$7.53187 + 7.19737I$	$-1.29280 - 5.42764I$
$u = -1.21414 - 0.79886I$ $a = -0.80618 + 1.32555I$ $b = -1.15564 - 1.28689I$	$8.2500 - 15.4047I$	$-2.88516 + 8.13192I$
$u = -1.21414 + 0.79886I$ $a = -0.80618 - 1.32555I$ $b = -1.15564 + 1.28689I$	$8.2500 + 15.4047I$	$-2.88516 - 8.13192I$
$u = -1.065435 - 0.776679I$ $a = 0.79380 - 1.47518I$ $b = 1.23888 + 1.53370I$	$3.17396 - 8.77694I$	$-3.98064 + 7.89789I$
$u = -1.065435 + 0.776679I$ $a = 0.79380 + 1.47518I$ $b = 1.23888 - 1.53370I$	$3.17396 + 8.77694I$	$-3.98064 - 7.89789I$
$u = -0.998921 - 0.724997I$ $a = -0.824145 + 0.951628I$ $b = -0.454183 - 0.696516I$	$2.96538 - 4.21460I$	$-4.81324 + 1.37191I$
$u = -0.998921 + 0.724997I$ $a = -0.824145 - 0.951628I$ $b = -0.454183 + 0.696516I$	$2.96538 + 4.21460I$	$-4.81324 - 1.37191I$
$u = -0.969617 - 0.854773I$ $a = 0.945992 - 0.082576I$ $b = -1.47588 + 1.57575I$	$7.84802 - 5.50326I$	$1.74847 + 5.79644I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.969617 + 0.854773I$ $a = 0.945992 + 0.082576I$ $b = -1.47588 - 1.57575I$	$7.84802 + 5.50326I$	$1.74847 - 5.79644I$
$u = -0.898968 - 0.805280I$ $a = 1.48193 + 0.16674I$ $b = 0.682111 - 0.148627I$	$5.31855 - 3.02042I$	$-15.4702 - 0.8822I$
$u = -0.898968 + 0.805280I$ $a = 1.48193 - 0.16674I$ $b = 0.682111 + 0.148627I$	$5.31855 + 3.02042I$	$-15.4702 + 0.8822I$
$u = -0.861156 - 0.894994I$ $a = -0.33542 + 1.57495I$ $b = -1.77332 - 1.19079I$	$8.18563 - 0.96335I$	$2.65582 - 0.09256I$
$u = -0.861156 + 0.894994I$ $a = -0.33542 - 1.57495I$ $b = -1.77332 + 1.19079I$	$8.18563 + 0.96335I$	$2.65582 + 0.09256I$
$u = -0.778806 - 0.103648I$ $a = -1.004526 - 0.086037I$ $b = -1.151804 - 0.485072I$	$-1.17157 - 5.91398I$	$2.20637 + 8.69493I$
$u = -0.778806 + 0.103648I$ $a = -1.004526 + 0.086037I$ $b = -1.151804 + 0.485072I$	$-1.17157 + 5.91398I$	$2.20637 - 8.69493I$
$u = -0.757104 - 0.786690I$ $a = -0.082397 - 1.043696I$ $b = -0.149310 + 0.794646I$	$3.72033 - 1.52573I$	$-2.97715 + 4.80548I$
$u = -0.757104 + 0.786690I$ $a = -0.082397 + 1.043696I$ $b = -0.149310 - 0.794646I$	$3.72033 + 1.52573I$	$-2.97715 - 4.80548I$
$u = -0.698652 - 0.895191I$ $a = -0.993201 + 0.828921I$ $b = 0.82225 - 1.68360I$	$4.30107 + 2.55894I$	$-1.82119 - 3.53976I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.698652 + 0.895191I$ $a = -0.993201 - 0.828921I$ $b = 0.82225 + 1.68360I$	$4.30107 - 2.55894I$	$-1.82119 + 3.53976I$
$u = -0.626077 - 0.139965I$ $a = 0.942781 - 0.803760I$ $b = 1.225355 - 0.246198I$	$-2.68564 + 0.62982I$	$-2.91172 + 0.97884I$
$u = -0.626077 + 0.139965I$ $a = 0.942781 + 0.803760I$ $b = 1.225355 + 0.246198I$	$-2.68564 - 0.62982I$	$-2.91172 - 0.97884I$
$u = -0.565814 - 1.147398I$ $a = 0.586418 - 0.893805I$ $b = -0.92728 + 1.37308I$	$10.31450 + 8.43955I$	$-0.65022 - 4.13629I$
$u = -0.565814 + 1.147398I$ $a = 0.586418 + 0.893805I$ $b = -0.92728 - 1.37308I$	$10.31450 - 8.43955I$	$-0.65022 + 4.13629I$
$u = -0.526112 - 1.208047I$ $a = -0.180970 + 0.781461I$ $b = 0.148746 - 1.186404I$	$9.82610 - 0.01608I$	$1.45425 + 0.18050I$
$u = -0.526112 + 1.208047I$ $a = -0.180970 - 0.781461I$ $b = 0.148746 + 1.186404I$	$9.82610 + 0.01608I$	$1.45425 - 0.18050I$
$u = -0.093469 - 0.137034I$ $a = 1.09478 + 2.52730I$ $b = -0.345092 + 0.814513I$	$1.82947 - 1.07812I$	$2.48829 + 1.79959I$
$u = -0.093469 + 0.137034I$ $a = 1.09478 - 2.52730I$ $b = -0.345092 - 0.814513I$	$1.82947 + 1.07812I$	$2.48829 - 1.79959I$
$u = 0.434172 - 0.311062I$ $a = 0.51325 + 2.05221I$ $b = -0.968161 - 0.658442I$	$2.25397 + 1.36700I$	$1.30471 - 4.47621I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.434172 + 0.311062I$ $a = 0.51325 - 2.05221I$ $b = -0.968161 + 0.658442I$	$2.25397 - 1.36700I$	$1.30471 + 4.47621I$
$u = 0.525437$ $a = -1.52938$ $b = 0.222426$	-0.954527	-10.1139
$u = 0.687161$ $a = 11.6667$ $b = 0.145926$	0.618242	-202.123
$u = 0.690875 - 0.281167I$ $a = -1.63585 - 0.73751I$ $b = 0.155632 + 0.399985I$	$-0.875787 + 0.039510I$	$-8.12380 + 0.07387I$
$u = 0.690875 + 0.281167I$ $a = -1.63585 + 0.73751I$ $b = 0.155632 - 0.399985I$	$-0.875787 - 0.039510I$	$-8.12380 - 0.07387I$
$u = 0.764975 - 0.478588I$ $a = -0.05345 + 1.98335I$ $b = 0.667437 - 1.036638I$	$-1.05831 + 3.36011I$	$-6.88945 - 7.26716I$
$u = 0.764975 + 0.478588I$ $a = -0.05345 - 1.98335I$ $b = 0.667437 + 1.036638I$	$-1.05831 - 3.36011I$	$-6.88945 + 7.26716I$
$u = 0.855886 - 0.862796I$ $a = -0.143884 - 1.345811I$ $b = -0.720152 + 1.125902I$	$3.93862 + 7.66972I$	$-2.36555 - 6.21599I$
$u = 0.855886 + 0.862796I$ $a = -0.143884 + 1.345811I$ $b = -0.720152 - 1.125902I$	$3.93862 - 7.66972I$	$-2.36555 + 6.21599I$
$u = 0.989321 - 0.869498I$ $a = 0.710026 + 0.507400I$ $b = -0.247996 - 0.981313I$	$3.55960 - 1.25869I$	$0.04120 + 1.78780I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.989321 + 0.869498I$ $a = 0.710026 - 0.507400I$ $b = -0.247996 + 0.981313I$	$3.55960 + 1.25869I$	$0.04120 - 1.78780I$
$u = 1.033483 - 0.093725I$ $a = -4.34666 + 0.37811I$ $b = -0.484814 - 0.321200I$	$0.321927 + 0.588102I$	$-6.8283 + 18.9142I$
$u = 1.033483 + 0.093725I$ $a = -4.34666 - 0.37811I$ $b = -0.484814 + 0.321200I$	$0.321927 - 0.588102I$	$-6.8283 - 18.9142I$
$u = 1.202256 - 0.035924I$ $a = -0.067077 + 0.771324I$ $b = 0.578274 + 0.672866I$	$-2.41059 - 1.46028I$	$-5.36364 + 4.61171I$
$u = 1.202256 + 0.035924I$ $a = -0.067077 - 0.771324I$ $b = 0.578274 - 0.672866I$	$-2.41059 + 1.46028I$	$-5.36364 - 4.61171I$
$u = 1.52770 - 0.06121I$ $a = -0.230584 + 0.148433I$ $b = -0.522294 + 0.982637I$	$1.89096 + 4.57089I$	$-1.63096 - 4.59769I$
$u = 1.52770 + 0.06121I$ $a = -0.230584 - 0.148433I$ $b = -0.522294 - 0.982637I$	$1.89096 - 4.57089I$	$-1.63096 + 4.59769I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u-1)^6(u^2+u-1)(u^{47}+8u^{46}+\dots+7u+1)$
c_2	$(u+1)^6(u^2+3u+1)(u^{47}+18u^{46}+\dots-3u+1)$
c_3	$u^6(u^2+u-1)(u^{47}+2u^{46}+\dots-64u+64)$
c_4	$(u+1)^6(u^2-u-1)(u^{47}+8u^{46}+\dots+7u+1)$
c_5	$(u^2+3u+1)(u^6-3u^5+5u^4-4u^3+2u^2-u+1)$ $(u^{47}+3u^{46}+\dots+2u+1)$
c_6	$u^6(u^2-u-1)(u^{47}+2u^{46}+\dots-64u+64)$
c_7	$(u+1)^2(u^6-u^5+\dots-u+1)(u^{47}+4u^{46}+\dots-11u-1)$
c_8	$(u^2-3u+1)(u^6-3u^5+5u^4-4u^3+2u^2-u+1)$ $(u^{47}+3u^{46}+\dots+698u+191)$
c_9	$(u^2-3u+1)(u^6-u^5+\dots-u+1)(u^{47}+u^{46}+\dots-3568u+5873)$
c_{10}	$(u-1)^2(u^6+u^5+\dots+u+1)(u^{47}+4u^{46}+\dots-11u-1)$
c_{11}	$u^2(u^6-u^5+\dots-u+1)(u^{47}+8u^{46}+\dots+48u-4)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y - 1)^6(y^2 - 3y + 1)(y^{47} - 18y^{46} + \dots - 3y - 1)$
c_2	$(y - 1)^6(y^2 - 7y + 1)(y^{47} + 30y^{46} + \dots - 1935y - 1)$
c_3, c_6	$y^6(y^2 - 3y + 1)(y^{47} + 36y^{46} + \dots - 61440y - 4096)$
c_5	$(y^2 - 7y + 1)(y^6 + y^5 + \dots + 3y + 1)(y^{47} + y^{46} + \dots + 8y - 1)$
c_7, c_{10}	$(y - 1)^2(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)$ $(y^{47} - 38y^{46} + \dots + 407y - 1)$
c_8	$(y^2 - 7y + 1)(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)$ $(y^{47} - 59y^{46} + \dots + 1536176y - 36481)$
c_9	$(y^2 - 7y + 1)(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)$ $(y^{47} - 19y^{46} + \dots + 74984424y - 34492129)$
c_{11}	$y^2(y^6 - 3y^5 + \dots - y + 1)(y^{47} + 12y^{46} + \dots + 1080y - 16)$