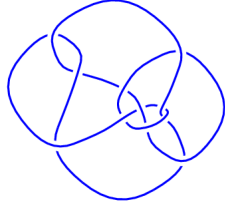
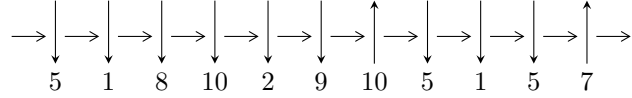


11n₁₁₈ (K11n₁₁₈)

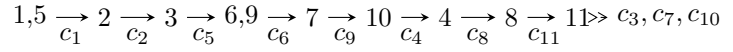


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle b^6 - b^5 - 2b^4 + 8b^3 - 14b^2 + 14b - 7, 4b^5 - 2b^4 - 9b^3 + 34b^2 - 39b + 13u + 30, -10b^5 + 5b^4 + 29b^3 - 59b^2 + 91b + 13a - 75 \rangle$$

$$I_2^u = \langle u^5 + 2u^4 - u^3 - 3u^2 + 2, -u^3 - u^2 + b + u + 1, -u^4 - 2u^3 + u^2 + 2a + u \rangle$$

$$I_3^u = \langle u^9 - 5u^8 + 7u^7 - u^6 + 5u^5 - 21u^4 + 11u^3 + 8u^2 - 2u - 2, u^8 - u^7 - 5u^6 + 3u^5 + 7u^4 + 7u^3 - 15u^2 + 2a + 2u^8 - 6u^7 + u^6 + 3u^5 + 15u^4 - 13u^3 - 10u^2 + b + 3u + 3 \rangle$$

There are 3 irreducible components with 20 representations.

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

$$\mathbf{I. } I_1^u = \langle b^6 - b^5 - 2b^4 + 8b^3 - 14b^2 + 14b - 7, 4b^5 - 2b^4 - 9b^3 + 34b^2 - 39b + 13u + 30, -10b^5 + 5b^4 + \dots + 13a - 75 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ -\frac{4}{13}b^5 + \frac{2}{13}b^4 + \dots + 3b - \frac{30}{13} \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ \frac{5}{13}b^5 + \frac{4}{13}b^4 + \dots - 2b + \frac{31}{13} \end{pmatrix} \\ a_3 &= \begin{pmatrix} -\frac{5}{13}b^5 - \frac{4}{13}b^4 + \dots + 2b - \frac{18}{13} \\ \frac{5}{13}b^5 + \frac{4}{13}b^4 + \dots - 2b + \frac{31}{13} \end{pmatrix} \\ a_6 &= \begin{pmatrix} \frac{4}{13}b^5 - \frac{2}{13}b^4 + \dots - 3b + \frac{30}{13} \\ \frac{9}{13}b^5 + \frac{2}{13}b^4 + \dots - 5b + \frac{48}{13} \end{pmatrix} \\ a_9 &= \begin{pmatrix} \frac{10}{13}b^5 - \frac{5}{13}b^4 + \dots - 7b + \frac{75}{13} \\ b \end{pmatrix} \\ a_7 &= \begin{pmatrix} \frac{10}{13}b^5 - \frac{5}{13}b^4 + \dots - 8b + \frac{62}{13} \\ 1 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} \frac{10}{13}b^5 - \frac{5}{13}b^4 + \dots - 8b + \frac{75}{13} \\ b \end{pmatrix} \\ a_4 &= \begin{pmatrix} -b^5 - b^4 + 2b^3 - 3b^2 + 4b + 1 \\ -0.538462b^5 + 0.769231b^4 + \dots + 7b - 5.53846 \end{pmatrix} \\ a_8 &= \begin{pmatrix} \frac{10}{13}b^5 - \frac{5}{13}b^4 + \dots - 7b + \frac{75}{13} \\ -\frac{9}{13}b^5 - \frac{2}{13}b^4 + \dots + 5b - \frac{48}{13} \end{pmatrix} \\ a_{11} &= \begin{pmatrix} \frac{10}{13}b^5 - \frac{5}{13}b^4 + \dots - 8b + \frac{75}{13} \\ 1 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} \frac{10}{13}b^5 - \frac{5}{13}b^4 + \dots - 8b + \frac{75}{13} \\ 1 \end{pmatrix} \end{aligned}$$

(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
$u = -1.80194$ $a = -1.40656$ $b = -2.47758$	-11.0446	-6.00000
$u = 1.24698$ $a = 0.722521 - 0.457399I$ $b = 0.222521 - 1.281603I$	0.234991	-6.00000
$u = 1.24698$ $a = 0.722521 + 0.457399I$ $b = 0.222521 + 1.281603I$	0.234991	-6.00000
$u = -0.445042$ $a = 1.40097 + 2.98949I$ $b = 0.900969 - 0.738343I$	5.87476	-6.00000
$u = -0.445042$ $a = 1.40097 - 2.98949I$ $b = 0.900969 + 0.738343I$	5.87476	-6.00000
$u = -1.80194$ $a = 1.15958$ $b = 1.23060$	-11.0446	-6.00000

II.

$$I_2^u = \langle u^5 + 2u^4 - u^3 - 3u^2 + 2, -u^3 - u^2 + b + u + 1, -u^4 - 2u^3 + u^2 + 2a + u \rangle$$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

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

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

$$a_7 = \begin{pmatrix} -\frac{1}{2}u^4 + \frac{3}{2}u^2 - \frac{1}{2}u - 1 \\ u^2 + u - 1 \end{pmatrix}$$

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

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

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

$$a_{11} = \begin{pmatrix} \frac{1}{2}u^4 - \frac{3}{2}u^2 + \frac{1}{2}u + 1 \\ u^4 + 2u^3 - u^2 - 2u + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{1}{2}u^4 - \frac{3}{2}u^2 + \frac{1}{2}u + 1 \\ u^4 + 2u^3 - u^2 - 2u + 1 \end{pmatrix}$$

(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
$u = -1.82854$ $a = -1.28165$ $b = -1.94171$	-12.4482	-13.1304
$u = -0.972160 - 0.575992I$ $a = -0.210793 - 1.027091I$ $b = 0.634295 + 0.253899I$	$6.00798 - 2.19755I$	$-5.78391 + 2.40841I$
$u = -0.972160 + 0.575992I$ $a = -0.210793 + 1.027091I$ $b = 0.634295 - 0.253899I$	$6.00798 + 2.19755I$	$-5.78391 - 2.40841I$
$u = 0.886428 - 0.266186I$ $a = -0.148382 - 0.576930I$ $b = -0.663438 - 0.814334I$	$-1.42879 - 1.52428I$	$-12.65090 + 2.62716I$
$u = 0.886428 + 0.266186I$ $a = -0.148382 + 0.576930I$ $b = -0.663438 + 0.814334I$	$-1.42879 + 1.52428I$	$-12.65090 - 2.62716I$

III.

$$I_3^u = \langle u^9 - 5u^8 + \dots - 2u - 2, u^8 - u^7 + \dots + 2a + 2, 2u^8 - 6u^7 + \dots + b + 3 \rangle$$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

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

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

$$a_9 = \begin{pmatrix} -\frac{1}{2}u^8 + \frac{1}{2}u^7 + \dots + \frac{15}{2}u^2 - 1 \\ -2u^8 + 6u^7 - u^6 - 3u^5 - 15u^4 + 13u^3 + 10u^2 - 3u - 3 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -\frac{3}{2}u^8 + \frac{11}{2}u^7 + \dots - 3u - 2 \\ -u^8 + 4u^7 - 3u^6 - u^5 - 8u^4 + 12u^3 + u^2 - u - 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{3}{2}u^8 - \frac{11}{2}u^7 + \dots + 3u + 2 \\ -2u^8 + 6u^7 - u^6 - 3u^5 - 15u^4 + 13u^3 + 10u^2 - 3u - 3 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{2}u^8 - \frac{3}{2}u^7 + \dots + u + 1 \\ -u^8 + 3u^7 - u^6 - u^5 - 7u^4 + 7u^3 + 4u^2 - u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{1}{2}u^8 + \frac{1}{2}u^7 + \dots + \frac{15}{2}u^2 - 1 \\ 2u^8 - 6u^7 + 2u^6 + u^5 + 14u^4 - 13u^3 - 4u^2 + 2u + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{3}{2}u^8 - \frac{11}{2}u^7 + \dots + 3u + 2 \\ u^8 - 5u^7 + 5u^6 + 2u^5 + 8u^4 - 18u^3 - u^2 + 4u + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{3}{2}u^8 - \frac{11}{2}u^7 + \dots + 3u + 2 \\ u^8 - 5u^7 + 5u^6 + 2u^5 + 8u^4 - 18u^3 - u^2 + 4u + 1 \end{pmatrix}$$

(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
$u = -0.827217 - 1.065602I$ $a = 0.127211 - 0.403713I$ $b = 1.189763 + 0.208029I$	$4.50943 - 3.60395I$	$-7.94742 + 3.61538I$
$u = -0.827217 + 1.065602I$ $a = 0.127211 + 0.403713I$ $b = 1.189763 - 0.208029I$	$4.50943 + 3.60395I$	$-7.94742 - 3.61538I$
$u = -0.390331 - 0.211849I$ $a = -0.15178 + 1.44152I$ $b = -0.619342 + 0.660345I$	$-0.58699 + 1.71933I$	$-2.65828 - 4.51037I$
$u = -0.390331 + 0.211849I$ $a = -0.15178 - 1.44152I$ $b = -0.619342 - 0.660345I$	$-0.58699 - 1.71933I$	$-2.65828 + 4.51037I$
$u = 0.637971$ $a = 0.581775$ $b = -0.134369$	-0.867730	-11.0839
$u = 1.60275 - 0.27471I$ $a = -1.057300 - 0.502009I$ $b = -1.245763 + 0.193497I$	$-7.17964 + 0.81901I$	$-9.63369 - 0.38923I$
$u = 1.60275 + 0.27471I$ $a = -1.057300 + 0.502009I$ $b = -1.245763 - 0.193497I$	$-7.17964 - 0.81901I$	$-9.63369 + 0.38923I$
$u = 1.79582 - 0.27938I$ $a = 1.290983 - 0.002356I$ $b = 1.74253 - 0.93792I$	$-4.53360 + 8.88256I$	$-8.21864 - 4.17646I$
$u = 1.79582 + 0.27938I$ $a = 1.290983 + 0.002356I$ $b = 1.74253 + 0.93792I$	$-4.53360 - 8.88256I$	$-8.21864 + 4.17646I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^3 - u^2 - 2u + 1)^2(u^5 + 2u^4 - u^3 - 3u^2 + 2)$ $(u^9 + 5u^8 + 7u^7 + u^6 + 5u^5 + 21u^4 + 11u^3 - 8u^2 - 2u + 2)$
c_2	$(u^3 + 5u^2 + 6u + 1)^2(u^5 + 6u^4 + 13u^3 + 17u^2 + 12u + 4)$ $(u^9 + 11u^8 + \dots + 36u + 4)$
c_3, c_{10}	$(u^5 + 2u^3 + u^2 - 3u + 1)(u^6 + u^5 + 2u^4 + 4u^3 - 2u^2 + 8u - 1)$ $(u^9 + 7u^7 - 2u^6 + 18u^5 - 8u^4 + 16u^3 - 7u^2 + 2u - 1)$
c_4	$(u^5 + 2u^3 - u^2 - 3u - 1)(u^6 + u^5 + 2u^4 + 4u^3 - 2u^2 + 8u - 1)$ $(u^9 + 7u^7 - 2u^6 + 18u^5 - 8u^4 + 16u^3 - 7u^2 + 2u - 1)$
c_5	$(u^3 - u^2 - 2u + 1)^2(u^5 - 2u^4 - u^3 + 3u^2 - 2)$ $(u^9 + 5u^8 + 7u^7 + u^6 + 5u^5 + 21u^4 + 11u^3 - 8u^2 - 2u + 2)$
c_6, c_9	$(u^5 - 2u^4 + u^2 - u - 1)(u^6 + u^5 - 2u^4 - 8u^3 - 14u^2 - 14u - 7)$ $(u^9 + 2u^8 - 3u^7 - 8u^6 + 6u^5 + 10u^4 - 10u^3 - 3u^2 + 8u - 1)$
c_7	$(u^3 - u^2 - 2u + 1)^2(u^5 + 3u^4 + 2u^3 - u^2 - 2u - 2)$ $(u^9 + 6u^8 + 19u^7 + 38u^6 + 54u^5 + 56u^4 + 49u^3 + 36u^2 + 16u + 2)$
c_8	$(u^5 - u^4 - u^3 - 4u^2 - 2u - 1)(u^6 + u^5 - 4u^4 - 2u^2 - 12u - 13)$ $(u^9 + u^8 - 8u^7 - 4u^6 + 21u^5 + 3u^4 - 3u^3 - 5u^2 + u + 1)$
c_{11}	$(u - 1)^6(u^5 + u^4 - u^3 + 2u - 1)$ $(u^9 + 8u^8 + 30u^7 + 69u^6 + 106u^5 + 109u^4 + 69u^3 + 18u^2 - 8u - 8)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^3 - 5y^2 + 6y - 1)^2(y^5 - 6y^4 + 13y^3 - 17y^2 + 12y - 4)$ $(y^9 - 11y^8 + \dots + 36y - 4)$
c_2	$(y^3 - 13y^2 + 26y - 1)^2(y^5 - 10y^4 - 11y^3 - 25y^2 + 8y - 16)$ $(y^9 - 23y^8 + \dots - 240y - 16)$
c_3, c_4, c_{10}	$(y^5 + 4y^4 - 2y^3 - 13y^2 + 7y - 1)$ $(y^6 + 3y^5 - 8y^4 - 42y^3 - 64y^2 - 60y + 1)$ $(y^9 + 14y^8 + 85y^7 + 280y^6 + 520y^5 + 512y^4 + 212y^3 - y^2 - 10y - 1)$
c_6, c_9	$(y^5 - 4y^4 + 2y^3 - 5y^2 + 3y - 1)(y^6 - 5y^5 - 8y^4 + 6y^3 + 49)$ $(y^9 - 10y^8 + \dots + 58y - 1)$
c_7	$(y^3 - 5y^2 + 6y - 1)^2(y^5 - 5y^4 + 6y^3 + 3y^2 - 4)$ $(y^9 + 2y^8 + 13y^7 + 34y^6 + 122y^5 + 4y^4 - 55y^3 + 48y^2 + 112y - 4)$
c_8	$(y^5 - 3y^4 - 11y^3 - 14y^2 - 4y - 1)$ $(y^6 - 9y^5 + 12y^4 + 14y^3 + 108y^2 - 92y + 169)$ $(y^9 - 17y^8 + \dots + 11y - 1)$
c_{11}	$(y - 1)^6(y^5 - 3y^4 + 5y^3 - 2y^2 + 4y - 1)$ $(y^9 - 4y^8 + 8y^7 - 7y^6 + 30y^5 - 89y^4 + 245y^3 + 316y^2 + 352y - 64)$