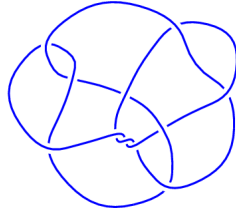
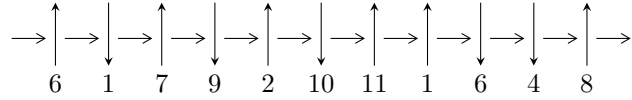


11n₄₈ (K11n₄₈)

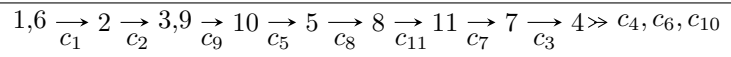


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle u^2 + u + 1, b, a - u - 1 \rangle$$

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

$$I_3^u = \langle u^{20} + 4u^{19} + \dots + 2u + 1, -1.14153 \times 10^{15}u^{19} - 4.26909 \times 10^{15}u^{18} + \dots + 8.56391 \times 10^{15}b + 1.10053 \times 10^{16} \\ 6.37825 \times 10^{15}u^{19} + 2.69128 \times 10^{16}u^{18} + \dots + 8.56391 \times 10^{15}a + 3.19918 \times 10^{16} \rangle$$

There are 3 irreducible components with 26 representations.

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

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

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

$$a_9 = \begin{pmatrix} u + 1 \\ 0 \end{pmatrix}$$

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

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

$$a_8 = \begin{pmatrix} u + 1 \\ 0 \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u + 1 \\ 0 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u - 1 \\ u + 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u - 1 \\ u + 1 \end{pmatrix}$$

(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
$u = -0.500000 - 0.866025I$	$-1.64493 + 2.02988I$	$-3.46410I$
$a = 0.500000 - 0.866025I$		
$b = 0$		
$u = -0.500000 + 0.866025I$	$-1.64493 - 2.02988I$	$3.46410I$
$a = 0.500000 + 0.866025I$		
$b = 0$		

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

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

$$a_9 = \begin{pmatrix} -u - 1 \\ b \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u - 1 \\ b + u \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} -b - u - 1 \\ b \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -bu - b - 1 \\ 2 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u + 1 \\ -b \end{pmatrix}$$

$$a_4 = \begin{pmatrix} b - u - 1 \\ -bu + 3u + 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} b - u - 1 \\ -bu + 3u + 1 \end{pmatrix}$$

(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
$u = -0.500000 - 0.866025I$ $a = -0.500000 + 0.866025I$ $b = -1.41421$	$3.28987 + 2.02988I$	$2.00000 - 3.46410I$
$u = -0.500000 - 0.866025I$ $a = -0.500000 + 0.866025I$ $b = 1.41421$	$3.28987 + 2.02988I$	$2.00000 - 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -0.500000 - 0.866025I$ $b = -1.41421$	$3.28987 - 2.02988I$	$2.00000 + 3.46410I$
$u = -0.500000 + 0.866025I$ $a = -0.500000 - 0.866025I$ $b = 1.41421$	$3.28987 - 2.02988I$	$2.00000 + 3.46410I$

$$\text{III. } I_3^u = \langle u^{20} + 4u^{19} + \dots + 2u + 1, -1.14 \times 10^{15}u^{19} - 4.27 \times 10^{15}u^{18} + \dots + 8.56 \times 10^{15}b + 1.10 \times 10^{16}, 6.38 \times 10^{15}u^{19} + 2.69 \times 10^{16}u^{18} + \dots + 8.56 \times 10^{15}a + 3.20 \times 10^{16} \rangle$$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

$$a_9 = \begin{pmatrix} -0.744782u^{19} - 3.14258u^{18} + \dots - 36.0811u - 3.73565 \\ 0.133295u^{19} + 0.498498u^{18} + \dots + 1.29523u - 1.28508 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.744782u^{19} - 3.14258u^{18} + \dots - 36.0811u - 3.73565 \\ 0.169440u^{19} + 0.644676u^{18} + \dots + 2.36692u - 1.12163 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.878077u^{19} - 3.64108u^{18} + \dots - 37.3764u - 2.45056 \\ 0.133295u^{19} + 0.498498u^{18} + \dots + 1.29523u - 1.28508 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1.12163u^{19} + 4.65596u^{18} + \dots + 50.9286u + 4.61018 \\ -0.278931u^{19} - 1.06850u^{18} + \dots - 2.73563u + 1.50344 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.408694u^{19} + 1.81167u^{18} + \dots + 31.0989u + 4.13465 \\ -0.233980u^{19} - 0.931452u^{18} + \dots - 3.19070u + 0.665806 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.174714u^{19} - 0.880217u^{18} + \dots - 27.9082u - 4.80045 \\ 0.258642u^{19} + 1.02897u^{18} + \dots + 6.32631u - 0.537037 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.174714u^{19} - 0.880217u^{18} + \dots - 27.9082u - 4.80045 \\ 0.258642u^{19} + 1.02897u^{18} + \dots + 6.32631u - 0.537037 \end{pmatrix}$$

(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
$u = -1.10251 - 0.94498I$		
$a = 0.757275 - 0.607433I$	$-0.59440 + 3.60439I$	$2.12405 - 4.48047I$
$b = -0.965691 - 0.331710I$		
$u = -1.10251 + 0.94498I$		
$a = 0.757275 + 0.607433I$	$-0.59440 - 3.60439I$	$2.12405 + 4.48047I$
$b = -0.965691 + 0.331710I$		
$u = -0.729618 - 0.601963I$		
$a = -0.002660 + 0.502436I$	$5.16928 + 2.57908I$	$8.86572 - 4.96809I$
$b = 1.343653 + 0.072587I$		
$u = -0.729618 + 0.601963I$		
$a = -0.002660 - 0.502436I$	$5.16928 - 2.57908I$	$8.86572 + 4.96809I$
$b = 1.343653 - 0.072587I$		
$u = -0.36649 - 1.92873I$		
$a = 0.003517 - 0.916631I$	$-10.3499 + 9.9960I$	$0.04826 - 5.02986I$
$b = -1.46300 - 0.57660I$		
$u = -0.36649 + 1.92873I$		
$a = 0.003517 + 0.916631I$	$-10.3499 - 9.9960I$	$0.04826 + 5.02986I$
$b = -1.46300 + 0.57660I$		
$u = -0.342865 - 1.301009I$		
$a = -0.567886 + 0.523820I$	$-1.166155 + 0.686038I$	$1.05440 + 1.40687I$
$b = -0.778134 + 0.346045I$		
$u = -0.342865 + 1.301009I$		
$a = -0.567886 - 0.523820I$	$-1.166155 - 0.686038I$	$1.05440 - 1.40687I$
$b = -0.778134 - 0.346045I$		
$u = -0.195248 - 0.372946I$		
$a = -0.774007 - 0.603593I$	$0.131319 + 1.058255I$	$2.00315 - 6.24655I$
$b = -0.277579 - 0.390975I$		
$u = -0.195248 + 0.372946I$		
$a = -0.774007 + 0.603593I$	$0.131319 - 1.058255I$	$2.00315 + 6.24655I$
$b = -0.277579 + 0.390975I$		

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.007874 - 1.394548I$ $a = 0.585444 + 0.602506I$ $b = 1.027385 + 0.480106I$	$-1.53618 + 5.13397I$	$0.62229 - 5.85487I$
$u = -0.007874 + 1.394548I$ $a = 0.585444 - 0.602506I$ $b = 1.027385 - 0.480106I$	$-1.53618 - 5.13397I$	$0.62229 + 5.85487I$
$u = 0.01089 - 1.99331I$ $a = 0.051284 + 0.957095I$ $b = 0.076693 + 1.208715I$	$-15.1661 + 3.6593I$	$-2.66886 - 2.23636I$
$u = 0.01089 + 1.99331I$ $a = 0.051284 - 0.957095I$ $b = 0.076693 - 1.208715I$	$-15.1661 - 3.6593I$	$-2.66886 + 2.23636I$
$u = 0.030822 - 0.170366I$ $a = -0.29189 + 5.45429I$ $b = -1.370381 - 0.067940I$	$3.14870 + 0.11294I$	$1.81708 + 1.16761I$
$u = 0.030822 + 0.170366I$ $a = -0.29189 - 5.45429I$ $b = -1.370381 + 0.067940I$	$3.14870 - 0.11294I$	$1.81708 - 1.16761I$
$u = 0.337333 - 0.681420I$ $a = -1.15996 - 1.26131I$ $b = 0.515876 - 0.585061I$	$-3.04083 + 0.89466I$	$-2.94359 + 0.44261I$
$u = 0.337333 + 0.681420I$ $a = -1.15996 + 1.26131I$ $b = 0.515876 + 0.585061I$	$-3.04083 - 0.89466I$	$-2.94359 - 0.44261I$
$u = 0.36556 - 1.75156I$ $a = -0.101116 - 1.030466I$ $b = 1.39118 - 0.66555I$	$-11.13935 - 2.93869I$	$-0.922503 + 0.819894I$
$u = 0.36556 + 1.75156I$ $a = -0.101116 + 1.030466I$ $b = 1.39118 + 0.66555I$	$-11.13935 + 2.93869I$	$-0.922503 - 0.819894I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2 + u + 1)^3(u^{20} + 4u^{19} + \dots + 2u + 1)$
c_2	$(u^2 + u + 1)^3(u^{20} + 28u^{19} + \dots + 74u + 1)$
c_3	$(u^2 - u + 1)(u^4 - 2u^3 + \dots + 2u + 1)(u^{20} + 8u^{18} + \dots - 16u + 41)$
c_4	$(u^2 - u + 1)(u^4 + 2u^3 + \dots - 2u + 1)(u^{20} + 2u^{19} + \dots - 2204u + 839)$
c_5	$(u^2 - u + 1)^3(u^{20} + 4u^{19} + \dots + 2u + 1)$
c_6	$(u - 1)^2(u + 1)^4(u^{20} + 3u^{19} + \dots - 19u + 7)$
c_7, c_8, c_{11}	$u^2(u^2 - 2)^2(u^{20} + u^{19} + \dots + 12u + 4)$
c_9	$(u - 1)^4(u + 1)^2(u^{20} + 3u^{19} + \dots - 19u + 7)$
c_{10}	$(u^2 - u + 1)(u^2 + u + 1)^2(u^{20} + 2u^{19} + \dots - 2u + 1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^2 + y + 1)^3(y^{20} + 28y^{19} + \dots + 74y + 1)$
c_2	$(y^2 + y + 1)^3(y^{20} - 68y^{19} + \dots - 1654y + 1)$
c_3	$(y^2 + y + 1)(y^4 + 6y^3 + 35y^2 + 6y + 1)$ $(y^{20} + 16y^{19} + \dots + 10814y + 1681)$
c_4	$(y^2 + y + 1)(y^4 + 6y^3 + 35y^2 + 6y + 1)$ $(y^{20} - 52y^{19} + \dots + 5336234y + 703921)$
c_6, c_9	$(y - 1)^6(y^{20} - 29y^{19} + \dots + 297y + 49)$
c_7, c_8, c_{11}	$y^2(y - 2)^4(y^{20} - 15y^{19} + \dots - 48y + 16)$
c_{10}	$(y^2 + y + 1)^3(y^{20} + 4y^{19} + \dots + 2y + 1)$