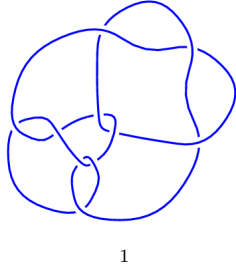
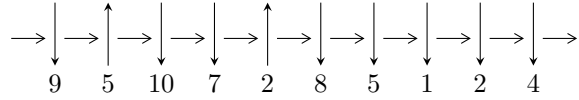


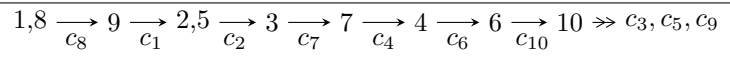
10<sub>149</sub> (K10n<sub>11</sub>)



**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

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

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

$$\begin{aligned} I_2^u = \langle & u^{22} + u^{21} + \dots + 104u^2 - 9, \\ & - 7.35788 \times 10^{30}u^{21} - 3.30448 \times 10^{30}u^{20} + \dots + 1.82577 \times 10^{31}a + 2.82744 \times 10^{31}, \\ & - 1.28108 \times 10^{31}u^{21} - 4.84463 \times 10^{30}u^{20} + \dots + 3.65154 \times 10^{31}b + 1.82963 \times 10^{32} \rangle \end{aligned}$$

There are 2 irreducible components with 24 representations.

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

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

**(i) Arc colorings**

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

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

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

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

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

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

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

$$a_4 = \begin{pmatrix} -1 \\ -b \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$$

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

**(ii) Obstruction class = 1**

**(iii) Cusp Shapes = -21**

(iv) Complex Volumes and Cusp Shapes

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = 1.00000$ $b = -0.618034$	-2.63189	-21.0000
$u = -1.00000$ $a = 1.00000$ $b = 1.61803$	-10.5276	-21.0000

$$\text{II. } I_2^u = \langle u^{22} + u^{21} + \dots + 104u^2 - 9, -7.36 \times 10^{30}u^{21} - 3.30 \times 10^{30}u^{20} + \dots + 1.83 \times 10^{31}a + 2.83 \times 10^{31}, -1.28 \times 10^{31}u^{21} - 4.84 \times 10^{30}u^{20} + \dots + 3.65 \times 10^{31}b + 1.83 \times 10^{32} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.403001u^{21} + 0.180991u^{20} + \dots + 11.2467u - 1.54863 \\ 0.350831u^{21} + 0.132673u^{20} + \dots + 5.94112u - 5.01057 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.0521698u^{21} + 0.0483176u^{20} + \dots + 5.30555u + 3.46194 \\ 0.350831u^{21} + 0.132673u^{20} + \dots + 5.94112u - 5.01057 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.167853u^{21} - 0.0489427u^{20} + \dots - 5.40869u - 3.86909 \\ 0.206228u^{21} + 0.0277419u^{20} + \dots + 2.68638u - 2.72478 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.167853u^{21} - 0.0489427u^{20} + \dots - 5.40869u - 3.86909 \\ 0.0231829u^{21} - 0.00720060u^{20} + \dots + 1.17570u - 0.773627 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 0.403001u^{21} + 0.180991u^{20} + \dots + 11.2467u - 1.54863 \\ 0.165508u^{21} + 0.0684145u^{20} + \dots + 2.31411u - 3.01248 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.362388u^{21} - 0.0108766u^{20} + \dots - 4.78694u + 7.03606 \\ -0.153546u^{21} - 0.0550249u^{20} + \dots - 3.33238u + 0.203122 \end{pmatrix} \\ a_6 &= \begin{pmatrix} -0.497841u^{21} - 0.128328u^{20} + \dots - 2.30037u + 9.23083 \\ -0.313935u^{21} - 0.00250308u^{20} + \dots - 3.43028u + 4.04486 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.411032u^{21} - 0.0490938u^{20} + \dots - 9.20236u + 7.50308 \\ -0.130882u^{21} - 0.0712371u^{20} + \dots - 3.21454u - 0.583105 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $-1.71558u^{21} - 0.254831u^{20} + \dots - 21.9461u + 14.1775$

(iv) Complex Volumes and Cusp Shapes

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.57096 - 0.94066I$ $a = -0.258512 + 0.561773I$ $b = -1.38990 + 0.37870I$	$-0.37121 + 4.08988I$	$-7.66142 - 3.87499I$
$u = -1.57096 + 0.94066I$ $a = -0.258512 - 0.561773I$ $b = -1.38990 - 0.37870I$	$-0.37121 - 4.08988I$	$-7.66142 + 3.87499I$
$u = -1.083737 - 0.669508I$ $a = -0.393332 + 0.920545I$ $b = -0.137382 + 0.980052I$	$3.27405 + 6.32540I$	$-5.56731 - 5.28995I$
$u = -1.083737 + 0.669508I$ $a = -0.393332 - 0.920545I$ $b = -0.137382 - 0.980052I$	$3.27405 - 6.32540I$	$-5.56731 + 5.28995I$
$u = -0.860192$ $a = 1.29256$ $b = -0.260308$	$-2.22827$	$0.635126$
$u = -0.751068$ $a = 2.13675$ $b = 1.22419$	$-6.34803$	$-16.4998$
$u = -0.625608 - 0.424523I$ $a = -1.25797 - 0.94803I$ $b = 1.195652 - 0.411381I$	$1.13790 + 4.89828I$	$-6.90240 - 4.82636I$
$u = -0.625608 + 0.424523I$ $a = -1.25797 + 0.94803I$ $b = 1.195652 + 0.411381I$	$1.13790 - 4.89828I$	$-6.90240 + 4.82636I$
$u = -0.515831$ $a = -0.182336$ $b = -0.736463$	$-1.10354$	$-8.74826$
$u = -0.447977 - 1.208301I$ $a = -0.344000 - 0.992002I$ $b = 1.207457 - 0.170395I$	$-4.60553 + 3.49423I$	$-13.3144 - 6.3296I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.447977 + 1.208301I$ $a = -0.344000 + 0.992002I$ $b = 1.207457 + 0.170395I$	$-4.60553 - 3.49423I$	$-13.3144 + 6.3296I$
$u = 0.094354 - 0.983533I$ $a = 0.329848 - 0.728206I$ $b = -0.096382 - 0.403421I$	$-0.85664 - 1.35693I$	$-6.38441 + 4.83589I$
$u = 0.094354 + 0.983533I$ $a = 0.329848 + 0.728206I$ $b = -0.096382 + 0.403421I$	$-0.85664 + 1.35693I$	$-6.38441 - 4.83589I$
$u = 0.313746 - 0.099352I$ $a = 1.64681 + 2.55270I$ $b = -1.154467 + 0.562023I$	$0.148418 - 0.912400I$	$-7.06168 + 2.22739I$
$u = 0.313746 + 0.099352I$ $a = 1.64681 - 2.55270I$ $b = -1.154467 - 0.562023I$	$0.148418 + 0.912400I$	$-7.06168 - 2.22739I$
$u = 0.72608 - 2.68987I$ $a = -0.026741 - 0.331798I$ $b = -1.080884 - 0.106938I$	$-3.24923 - 0.58535I$	$-11.5610 - 9.1342I$
$u = 0.72608 + 2.68987I$ $a = -0.026741 + 0.331798I$ $b = -1.080884 + 0.106938I$	$-3.24923 + 0.58535I$	$-11.5610 + 9.1342I$
$u = 1.06827$ $a = 0.772350$ $b = 1.66272$	$-10.1504$	$0.707927$
$u = 1.217790 - 0.169386I$ $a = 0.441293 + 0.779766I$ $b = 0.123407 + 0.853958I$	$4.43145 + 0.35468I$	$-3.17978 + 0.18562I$
$u = 1.217790 + 0.169386I$ $a = 0.441293 - 0.779766I$ $b = 0.123407 - 0.853958I$	$4.43145 - 0.35468I$	$-3.17978 - 0.18562I$
Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.40572 - 1.40325I$ $a = 0.186270 + 0.696267I$ $b = 1.38743 + 0.45171I$	$-1.50863 - 11.44273I$	$-9.41507 + 7.02258I$
$u = 1.40572 + 1.40325I$ $a = 0.186270 - 0.696267I$ $b = 1.38743 - 0.45171I$	$-1.50863 + 11.44273I$	$-9.41507 - 7.02258I$

### III. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u^2 - u - 1)(u^{22} + 2u^{21} + \dots - 5u + 1)$
$c_2, c_5$	$u^2(u^{22} + 3u^{21} + \dots + 28u + 4)$
$c_3$	$(u^2 - u - 1)(u^{22} + 2u^{21} + \dots + u + 1)$
$c_4$	$(u - 1)^2(u^{22} + 3u^{21} + \dots + 12u + 1)$
$c_6$	$(u - 1)^2(u^{22} + 9u^{21} + \dots + 120u + 1)$
$c_7$	$(u + 1)^2(u^{22} + 3u^{21} + \dots + 12u + 1)$
$c_8, c_9$	$(u^2 + u - 1)(u^{22} + 2u^{21} + \dots - 5u + 1)$
$c_{10}$	$(u^2 + u - 1)(u^{22} + 2u^{21} + \dots + u + 1)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_8, c_9$	$(y^2 - 3y + 1)(y^{22} - 18y^{21} + \dots - 9y + 1)$
$c_2, c_5$	$y^2(y^{22} - 15y^{21} + \dots - 264y + 16)$
$c_3, c_{10}$	$(y^2 - 3y + 1)(y^{22} - 6y^{21} + \dots - 9y + 1)$
$c_4, c_7$	$(y - 1)^2(y^{22} - 9y^{21} + \dots - 120y + 1)$
$c_6$	$(y - 1)^2(y^{22} + 11y^{21} + \dots - 12776y + 1)$