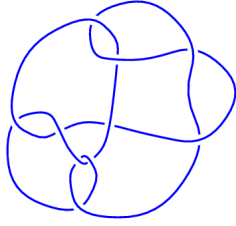
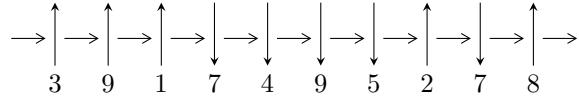


10₁₃₅ (K10n₅)

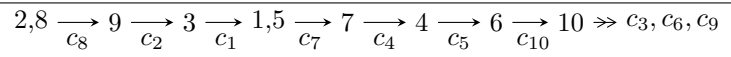


1

Arc Sequences



Solving Sequence



Representation Ideals

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

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

$$I_2^u = \langle u^{21} - 2u^{20} + \dots + 7u - 85, \\ -4.14212 \times 10^{35}u^{20} + 8.57345 \times 10^{35}u^{19} + \dots + 4.58432 \times 10^{37}b - 1.63308 \times 10^{37}, \\ 8.04820 \times 10^{37}u^{20} - 1.53060 \times 10^{38}u^{19} + \dots + 3.89667 \times 10^{39}a - 1.77848 \times 10^{39} \rangle$$

There are 2 irreducible components with 24 representations.

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

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

(i) Arc colorings

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

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

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

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

$$a_1 = \begin{pmatrix} 0 \\ u^2 \end{pmatrix}$$

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

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

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

$$a_6 = \begin{pmatrix} -u^2 + u - 2 \\ u^2 + 1 \end{pmatrix}$$

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

(ii) Obstruction class = 1

(iii) Cusp Shapes = $7u^2 - 5u + 5$

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.215080 - 1.307141I$ $a = -0.122561 - 0.744862I$ $b = -0.877439 + 0.744862I$	$-4.66906 - 2.82812I$	$-7.71191 + 2.59975I$
$u = 0.215080 + 1.307141I$ $a = -0.122561 + 0.744862I$ $b = -0.877439 - 0.744862I$	$-4.66906 + 2.82812I$	$-7.71191 - 2.59975I$
$u = 0.569840$ $a = -1.75488$ $b = 0.754878$	-0.531480	4.42382

$$\text{II. } I_2^u = \langle u^{21} - 2u^{20} + \dots + 7u - 85, -4.14 \times 10^{35}u^{20} + 8.57 \times 10^{35}u^{19} + \dots + 4.58 \times 10^{37}b - 1.63 \times 10^{37}, 8.05 \times 10^{37}u^{20} - 1.53 \times 10^{38}u^{19} + \dots + 3.90 \times 10^{39}a - 1.78 \times 10^{39} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.0206540u^{20} + 0.0392797u^{19} + \dots + 3.40406u + 0.456411 \\ 0.00903541u^{20} - 0.0187017u^{19} + \dots - 2.62821u + 0.356231 \end{pmatrix} \\ a_9 &= \begin{pmatrix} -0.0116186u^{20} + 0.0205780u^{19} + \dots + 0.775853u + 0.812642 \\ 0.00903541u^{20} - 0.0187017u^{19} + \dots - 2.62821u + 0.356231 \end{pmatrix} \\ a_3 &= \begin{pmatrix} 0.00300327u^{20} - 0.00620089u^{19} + \dots - 0.566824u + 1.17775 \\ -0.000909868u^{20} - 0.00553251u^{19} + \dots + 0.585631u + 1.41382 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 0.0161310u^{20} - 0.0448934u^{19} + \dots - 1.18001u + 2.92372 \\ 0.000649318u^{20} - 0.00275159u^{19} + \dots + 0.919236u - 0.0686905 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.0206540u^{20} + 0.0392797u^{19} + \dots + 3.40406u + 0.456411 \\ 0.000846197u^{20} - 0.00536711u^{19} + \dots - 0.886816u + 0.528644 \end{pmatrix} \\ a_4 &= \begin{pmatrix} 0.00665576u^{20} - 0.0234770u^{19} + \dots + 0.928091u + 2.55427 \\ -0.00524729u^{20} + 0.00608328u^{19} + \dots + 1.62657u + 0.531450 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0.0303553u^{20} - 0.0576998u^{19} + \dots - 7.33398u - 0.641791 \\ 0.00804957u^{20} - 0.0206389u^{19} + \dots - 0.110740u + 1.14078 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.0124242u^{20} + 0.0129921u^{19} + \dots + 3.70821u + 2.66745 \\ 0.00524729u^{20} - 0.00608328u^{19} + \dots - 1.62657u - 0.531450 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

$$\text{(iii) Cusp Shapes} = -0.00376892u^{20} - 0.0149564u^{19} + \dots - 1.12863u + 1.16821$$

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.02434 - 2.16479I$		
$a = 0.534577 - 0.190790I$	$8.83595 - 3.51416I$	$4.91512 + 2.66916I$
$b = -1.169826 + 0.051846I$		
$u = -1.02434 + 2.16479I$		
$a = 0.534577 + 0.190790I$	$8.83595 + 3.51416I$	$4.91512 - 2.66916I$
$b = -1.169826 - 0.051846I$		
$u = -0.703419 - 0.890089I$		
$a = -0.313344 - 0.202642I$	$1.46918 + 0.34630I$	$5.96536 - 0.53554I$
$b = 0.853051 + 0.160221I$		
$u = -0.703419 + 0.890089I$		
$a = -0.313344 + 0.202642I$	$1.46918 - 0.34630I$	$5.96536 + 0.53554I$
$b = 0.853051 - 0.160221I$		
$u = -0.569601 - 0.261224I$		
$a = 2.05326 + 0.46735I$	$2.42497 - 4.94435I$	$-1.24866 + 2.70559I$
$b = 0.567882 + 0.851579I$		
$u = -0.569601 + 0.261224I$		
$a = 2.05326 - 0.46735I$	$2.42497 + 4.94435I$	$-1.24866 - 2.70559I$
$b = 0.567882 - 0.851579I$		
$u = -0.072252 - 0.712453I$		
$a = 0.506395 + 1.227569I$	$-1.83472 - 0.21101I$	$-3.18710 + 0.57244I$
$b = -0.707761 + 0.560391I$		
$u = -0.072252 + 0.712453I$		
$a = 0.506395 - 1.227569I$	$-1.83472 + 0.21101I$	$-3.18710 - 0.57244I$
$b = -0.707761 - 0.560391I$		
$u = 0.117256 - 0.594050I$		
$a = -1.68359 - 0.96506I$	$3.29052 + 1.36266I$	$-0.18856 - 2.27516I$
$b = 0.427156 + 0.796867I$		
$u = 0.117256 + 0.594050I$		
$a = -1.68359 + 0.96506I$	$3.29052 - 1.36266I$	$-0.18856 + 2.27516I$
$b = 0.427156 - 0.796867I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.13316 - 1.77819I$		
$a = 0.012577 + 0.714869I$	$-3.02655 - 2.36605I$	$-0.59037 + 2.67274I$
$b = 0.848992 - 0.598239I$		
$u = 0.13316 + 1.77819I$		
$a = 0.012577 - 0.714869I$	$-3.02655 + 2.36605I$	$-0.59037 - 2.67274I$
$b = 0.848992 + 0.598239I$		
$u = 0.43502 - 2.72022I$		
$a = -0.364037 - 0.352429I$	$3.96319 + 10.68717I$	$0.56681 - 6.96141I$
$b = 1.075838 + 0.689537I$		
$u = 0.43502 + 2.72022I$		
$a = -0.364037 + 0.352429I$	$3.96319 - 10.68717I$	$0.56681 + 6.96141I$
$b = 1.075838 - 0.689537I$		
$u = 0.439691 - 1.065143I$		
$a = -0.164036 - 0.516848I$	$-3.85955 - 2.93752I$	$2.97600 + 3.43881I$
$b = -0.882737 + 0.780973I$		
$u = 0.439691 + 1.065143I$		
$a = -0.164036 + 0.516848I$	$-3.85955 + 2.93752I$	$2.97600 - 3.43881I$
$b = -0.882737 - 0.780973I$		
$u = 0.555881$		
$a = 1.51829$	-1.20998	-9.37190
$b = -0.289436$		
$u = 0.93625 - 1.78325I$		
$a = 0.434228 + 0.145921I$	$-1.06863 + 4.45806I$	$-0.43689 - 6.14529I$
$b = -0.951460 - 0.595395I$		
$u = 0.93625 + 1.78325I$		
$a = 0.434228 - 0.145921I$	$-1.06863 - 4.45806I$	$-0.43689 + 6.14529I$
$b = -0.951460 + 0.595395I$		
$u = 1.03030 - 1.04737I$		
$a = -0.839884 + 0.137633I$	$5.21503 - 3.89686I$	$2.41425 + 2.65107I$
$b = 1.083584 - 0.616829I$		
Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.03030 + 1.04737I$		
$a = -0.839884 - 0.137633I$	$5.21503 + 3.89686I$	$2.41425 - 2.65107I$
$b = 1.083584 + 0.616829I$		

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^3 + u^2 + 2u + 1)(u^{21} + 8u^{20} + \dots + 17u + 1)$
c_2	$(u^3 + u^2 - 1)(u^{21} + 2u^{20} + \dots + u - 1)$
c_3	$(u^3 - u^2 + 2u - 1)(u^{21} + 8u^{20} + \dots + 17u + 1)$
c_4	$(u - 1)^3(u^{21} + 4u^{20} + \dots - 2u - 1)$
c_5	$(u + 1)^3(u^{21} + 6u^{20} + \dots - 2u + 1)$
c_6, c_9	$u^3(u^{21} + u^{20} + \dots + 4u - 8)$
c_7	$(u + 1)^3(u^{21} + 4u^{20} + \dots - 2u - 1)$
c_8	$(u^3 - u^2 + 1)(u^{21} + 2u^{20} + \dots + u - 1)$
c_{10}	$(u^3 - u^2 + 2u - 1)(u^{21} + 2u^{20} + \dots + 3u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3	$(y^3 + 3y^2 + 2y - 1)(y^{21} + 12y^{20} + \dots + 137y - 1)$
c_2, c_8	$(y^3 - y^2 + 2y - 1)(y^{21} - 8y^{20} + \dots + 17y - 1)$
c_4, c_7	$(y - 1)^3(y^{21} - 6y^{20} + \dots - 2y - 1)$
c_5	$(y - 1)^3(y^{21} + 22y^{20} + \dots + 66y - 1)$
c_6, c_9	$y^3(y^{21} + 21y^{20} + \dots - 176y - 64)$
c_{10}	1.00000000 $(1y^3 + 3.00000000y^2 + 2.00000000y - 1.00000000)$ $(1y^{21} - 24.00000000y^{20} + \dots + 17.00000000y - 1.00000000)$