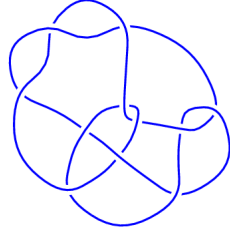
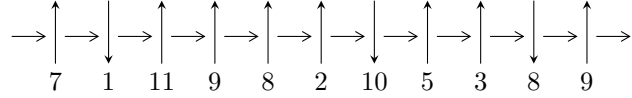


11n₁₃₁ (K11n₁₃₁)

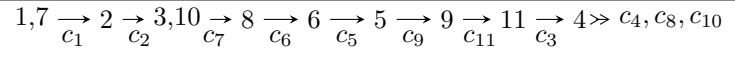


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle u^{11} + u^{10} + 3u^9 + 3u^8 + 5u^7 + 7u^6 + 5u^5 + 8u^4 + 3u^3 + 5u^2 + u + 1, \\ -u^9 - u^8 - 2u^7 - 2u^6 - 3u^5 - 5u^4 - 2u^3 - 3u^2 + a - u - 2, \\ -u^{10} - 2u^9 - 3u^8 - 5u^7 - 6u^6 - 10u^5 - 9u^4 - 8u^3 - 9u^2 + b - 4u - 4 \rangle$$

$$I_2^u = \langle u^{44} + 8u^{42} + \dots - 28u + 19, 9.69653 \times 10^{36}u^{43} + 1.93812 \times 10^{38}u^{42} + \dots + 1.36546 \times 10^{39}b + 1.44554 \times 10^{40} \\ - 2.34671 \times 10^{40}u^{43} - 2.31254 \times 10^{39}u^{42} + \dots + 2.59437 \times 10^{40}a + 1.06428 \times 10^{41} \rangle$$

There are 2 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>”

$$I_1^u = \langle u^{11} + u^{10} + \cdots + u + 1, -u^9 - u^8 + \cdots + a - 2, -u^{10} - 2u^9 + \cdots + b - 4 \rangle \quad \mathbf{I.}$$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} u^9 + u^8 + 2u^7 + 2u^6 + 3u^5 + 5u^4 + 2u^3 + 3u^2 + u + 2 \\ u^{10} + 2u^9 + 3u^8 + 5u^7 + 6u^6 + 10u^5 + 9u^4 + 8u^3 + 9u^2 + 4u + 4 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -3u^{10} - 2u^9 - 6u^8 - 5u^7 - 8u^6 - 13u^5 - 3u^4 - 11u^3 - 4u + 1 \\ 2u^9 + u^8 + 4u^7 + 3u^6 + 5u^5 + 8u^4 + u^3 + 8u^2 + 3 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} u^9 + u^8 + 2u^7 + 2u^6 + 2u^5 + 4u^4 + u^3 + 2u^2 - u - 1 \\ -u^9 - u^8 - 2u^7 - 2u^6 - 3u^5 - 5u^4 - 2u^3 - 4u^2 - u - 2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^7 - u^6 - u^5 - u^4 - u^3 - 3u^2 \\ u^{10} + 3u^9 + 4u^8 + 7u^7 + 8u^6 + 12u^5 + 13u^4 + 9u^3 + 11u^2 + 4u + 4 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 3u^{10} + 4u^9 + \cdots + 8u + 5 \\ 2u^{10} + u^9 + 5u^8 + 4u^7 + 7u^6 + 11u^5 + 4u^4 + 13u^3 + 2u^2 + 6u + 2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -2u^{10} - u^9 - 5u^8 - 4u^7 - 7u^6 - 11u^5 - 4u^4 - 13u^3 - u^2 - 6u - 1 \\ -u^{10} - 2u^9 - 4u^8 - 5u^7 - 7u^6 - 10u^5 - 10u^4 - 10u^3 - 7u^2 - 6u - 3 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -2u^{10} - u^9 - 5u^8 - 4u^7 - 7u^6 - 11u^5 - 4u^4 - 13u^3 - u^2 - 6u - 1 \\ -u^{10} - 2u^9 - 4u^8 - 5u^7 - 7u^6 - 10u^5 - 10u^4 - 10u^3 - 7u^2 - 6u - 3 \end{pmatrix}$$

(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
$u = -1.27239$ $a = 0.381829$ $b = -0.0451978$	2.76650	23.9435
$u = -0.535222 - 1.201171I$ $a = -0.093193 - 0.766402I$ $b = -0.63928 + 1.45867I$	$-1.44280 + 5.48967I$	$2.58502 - 8.73904I$
$u = -0.535222 + 1.201171I$ $a = -0.093193 + 0.766402I$ $b = -0.63928 - 1.45867I$	$-1.44280 - 5.48967I$	$2.58502 + 8.73904I$
$u = -0.299778 - 0.927842I$ $a = 0.63272 - 1.53718I$ $b = -1.147891 + 0.441102I$	$-4.88598 + 1.24077I$	$-7.95477 + 0.13168I$
$u = -0.299778 + 0.927842I$ $a = 0.63272 + 1.53718I$ $b = -1.147891 - 0.441102I$	$-4.88598 - 1.24077I$	$-7.95477 - 0.13168I$
$u = -0.127541 - 0.574472I$ $a = 1.39365 - 0.29759I$ $b = 1.76363 - 0.62512I$	$1.73238 - 2.30988I$	$9.96723 + 2.64055I$
$u = -0.127541 + 0.574472I$ $a = 1.39365 + 0.29759I$ $b = 1.76363 + 0.62512I$	$1.73238 + 2.30988I$	$9.96723 - 2.64055I$
$u = 0.363187 - 0.893448I$ $a = 0.626586 + 1.218743I$ $b = 0.332981 - 0.934382I$	$-7.76852 - 1.52130I$	$0.55594 + 5.61462I$
$u = 0.363187 + 0.893448I$ $a = 0.626586 - 1.218743I$ $b = 0.332981 + 0.934382I$	$-7.76852 + 1.52130I$	$0.55594 - 5.61462I$
$u = 0.735549 - 0.971108I$ $a = 0.249319 + 0.595629I$ $b = -1.286840 - 0.135867I$	$-5.46767 - 2.92476I$	$-5.12520 + 4.54367I$
Solution to I_1^v	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.735549 + 0.971108I$ $a = 0.249319 - 0.595629I$ $b = -1.286840 + 0.135867I$	$-5.46767 + 2.92476I$	$-5.12520 - 4.54367I$

$$\text{II. } J_2^u = \langle u^{44} + 8u^{42} + \dots - 28u + 19, 9.70 \times 10^{36} u^{43} + 1.94 \times 10^{38} u^{42} + \dots + 1.37 \times 10^{39} b + 1.45 \times 10^{39}, -2.35 \times 10^{40} u^{43} - 2.31 \times 10^{39} u^{42} + \dots + 2.59 \times 10^{40} a + 1.06 \times 10^{41} \rangle$$

(i) Arc colorings

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

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

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

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

$$a_{10} = \begin{pmatrix} 0.904540u^{43} + 0.0891368u^{42} + \dots + 28.1734u - 4.10227 \\ -0.00710130u^{43} - 0.141939u^{42} + \dots + 5.47040u - 1.05865 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.129802u^{43} + 0.616286u^{42} + \dots - 13.9864u + 18.1892 \\ -0.112721u^{43} - 0.238849u^{42} + \dots - 2.68255u - 7.40994 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 0.855694u^{43} - 0.294688u^{42} + \dots + 42.8937u - 18.2259 \\ -0.198202u^{43} + 0.0959296u^{42} + \dots - 8.51213u + 7.37608 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1.12405u^{43} - 0.0401899u^{42} + \dots + 35.9422u - 8.61657 \\ 0.406276u^{43} + 0.227899u^{42} + \dots + 10.7610u + 3.51106 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.232879u^{43} + 0.618756u^{42} + \dots - 6.55564u + 18.5444 \\ -0.0121303u^{43} + 0.0705266u^{42} + \dots - 6.59355u + 5.72029 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.925125u^{43} + 0.652168u^{42} + \dots + 16.2508u + 7.52727 \\ -0.107850u^{43} + 0.505554u^{42} + \dots - 18.8829u + 20.6647 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} 0.925125u^{43} + 0.652168u^{42} + \dots + 16.2508u + 7.52727 \\ -0.107850u^{43} + 0.505554u^{42} + \dots - 18.8829u + 20.6647 \end{pmatrix}$$

(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
$u = -1.33218$ $a = 0.419650$ $b = -0.343484$	2.55385	-14.8813
$u = -1.004834 - 0.721198I$ $a = -0.817876 - 0.261435I$ $b = 0.420704 + 1.060050I$	$5.67789 - 0.23429I$	$7.33450 + 1.57451I$
$u = -1.004834 + 0.721198I$ $a = -0.817876 + 0.261435I$ $b = 0.420704 - 1.060050I$	$5.67789 + 0.23429I$	$7.33450 - 1.57451I$
$u = -0.801504 - 1.072619I$ $a = 0.171221 + 0.993803I$ $b = 1.18028 - 1.27689I$	$4.52542 + 6.79447I$	$5.75672 - 4.75364I$
$u = -0.801504 + 1.072619I$ $a = 0.171221 - 0.993803I$ $b = 1.18028 + 1.27689I$	$4.52542 - 6.79447I$	$5.75672 + 4.75364I$
$u = -0.769126$ $a = 0.807876$ $b = 0.267033$	1.54727	4.67399
$u = -0.725736 - 1.115000I$ $a = 0.122771 - 0.880273I$ $b = -0.87157 + 1.15445I$	$-0.55823 + 5.04012I$	$8.95344 - 5.95960I$
$u = -0.725736 + 1.115000I$ $a = 0.122771 + 0.880273I$ $b = -0.87157 - 1.15445I$	$-0.55823 - 5.04012I$	$8.95344 + 5.95960I$
$u = -0.724746 - 0.501149I$ $a = 0.790041 + 0.280445I$ $b = 0.212674 - 0.438603I$	$1.31409 + 0.60593I$	$8.59743 - 3.14385I$
$u = -0.724746 + 0.501149I$ $a = 0.790041 - 0.280445I$ $b = 0.212674 + 0.438603I$	$1.31409 - 0.60593I$	$8.59743 + 3.14385I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.691309 - 0.811314I$ $a = -1.341520 + 0.125641I$ $b = -0.247744 + 0.790756I$	$4.27651 - 0.41832I$	$5.68762 - 0.89780I$
$u = -0.691309 + 0.811314I$ $a = -1.341520 - 0.125641I$ $b = -0.247744 - 0.790756I$	$4.27651 + 0.41832I$	$5.68762 + 0.89780I$
$u = -0.672004 - 0.909211I$ $a = -0.118766 + 1.200990I$ $b = 0.67880 - 1.94511I$	$3.96994 + 5.67612I$	$4.70172 - 5.28440I$
$u = -0.672004 + 0.909211I$ $a = -0.118766 - 1.200990I$ $b = 0.67880 + 1.94511I$	$3.96994 - 5.67612I$	$4.70172 + 5.28440I$
$u = -0.489616 - 1.163076I$ $a = 0.051203 - 0.505529I$ $b = -0.89249 + 1.30630I$	$-1.75776 + 4.42520I$	$0.29599 - 2.66999I$
$u = -0.489616 + 1.163076I$ $a = 0.051203 + 0.505529I$ $b = -0.89249 - 1.30630I$	$-1.75776 - 4.42520I$	$0.29599 + 2.66999I$
$u = -0.191318 - 0.786546I$ $a = -0.321704 + 0.371146I$ $b = 2.20155 - 0.83164I$	$1.02150 - 1.91904I$	$-0.873774 - 0.783296I$
$u = -0.191318 + 0.786546I$ $a = -0.321704 - 0.371146I$ $b = 2.20155 + 0.83164I$	$1.02150 + 1.91904I$	$-0.873774 + 0.783296I$
$u = -0.180695 - 1.380015I$ $a = -0.137763 - 0.704470I$ $b = 0.033690 + 0.557996I$	$-3.28704 + 5.28886I$	$-1.34806 - 7.01858I$
$u = -0.180695 + 1.380015I$ $a = -0.137763 + 0.704470I$ $b = 0.033690 - 0.557996I$	$-3.28704 - 5.28886I$	$-1.34806 + 7.01858I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.038388 - 0.751954I$ $a = 1.43109 + 0.27249I$ $b = 1.141290 + 0.618112I$	$0.97471 + 2.65784I$	$-0.64848 - 4.81672I$
$u = 0.038388 + 0.751954I$ $a = 1.43109 - 0.27249I$ $b = 1.141290 - 0.618112I$	$0.97471 - 2.65784I$	$-0.64848 + 4.81672I$
$u = 0.155660 - 0.819694I$ $a = -0.50119 - 1.50907I$ $b = -0.837138 + 0.913868I$	$-8.09531 - 0.68903I$	$-3.33839 - 2.14717I$
$u = 0.155660 + 0.819694I$ $a = -0.50119 + 1.50907I$ $b = -0.837138 - 0.913868I$	$-8.09531 + 0.68903I$	$-3.33839 + 2.14717I$
$u = 0.305333 - 1.097036I$ $a = 0.502841 + 0.752892I$ $b = -0.431064 - 0.191810I$	$-3.64801 - 0.66413I$	$-0.67434 - 1.82360I$
$u = 0.305333 + 1.097036I$ $a = 0.502841 - 0.752892I$ $b = -0.431064 + 0.191810I$	$-3.64801 + 0.66413I$	$-0.67434 + 1.82360I$
$u = 0.358331 - 0.841835I$ $a = 0.73681 + 1.63006I$ $b = -0.800323 - 0.656423I$	$-4.31132 - 1.52913I$	$4.89215 + 5.65142I$
$u = 0.358331 + 0.841835I$ $a = 0.73681 - 1.63006I$ $b = -0.800323 + 0.656423I$	$-4.31132 + 1.52913I$	$4.89215 - 5.65142I$
$u = 0.525867 - 1.092400I$ $a = -0.400089 + 1.030593I$ $b = -1.09956 - 1.76264I$	$-2.17094 - 6.60740I$	$-0.69632 + 10.88929I$
$u = 0.525867 + 1.092400I$ $a = -0.400089 - 1.030593I$ $b = -1.09956 + 1.76264I$	$-2.17094 + 6.60740I$	$-0.69632 - 10.88929I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.553611 - 0.824772I$ $a = 0.447859 + 1.150177I$ $b = -1.49583 - 0.39989I$	$-3.21451 - 2.15595I$	$1.07743 + 2.96858I$
$u = 0.553611 + 0.824772I$ $a = 0.447859 - 1.150177I$ $b = -1.49583 + 0.39989I$	$-3.21451 + 2.15595I$	$1.07743 - 2.96858I$
$u = 0.634927 - 0.276340I$ $a = 1.29507 - 0.74684I$ $b = -0.103239 + 0.918524I$	$0.09044 + 2.10677I$	$3.45567 - 5.29032I$
$u = 0.634927 + 0.276340I$ $a = 1.29507 + 0.74684I$ $b = -0.103239 - 0.918524I$	$0.09044 - 2.10677I$	$3.45567 + 5.29032I$
$u = 0.702097 - 0.948685I$ $a = -1.230739 + 0.211924I$ $b = -0.165846 - 1.175811I$	$5.04402 - 6.54331I$	$5.65027 + 5.81604I$
$u = 0.702097 + 0.948685I$ $a = -1.230739 - 0.211924I$ $b = -0.165846 + 1.175811I$	$5.04402 + 6.54331I$	$5.65027 - 5.81604I$
$u = 0.724813 - 0.904533I$ $a = -0.048082 - 0.448492I$ $b = 1.168585 - 0.034882I$	$-4.81373 - 2.81453I$	$7.83387 + 2.63389I$
$u = 0.724813 + 0.904533I$ $a = -0.048082 + 0.448492I$ $b = 1.168585 + 0.034882I$	$-4.81373 + 2.81453I$	$7.83387 - 2.63389I$
$u = 0.748515 - 1.151138I$ $a = 0.050409 - 1.131160I$ $b = 1.37231 + 1.59702I$	$3.0688 - 14.3723I$	$3.57455 + 8.23244I$
$u = 0.748515 + 1.151138I$ $a = 0.050409 + 1.131160I$ $b = 1.37231 - 1.59702I$	$3.0688 + 14.3723I$	$3.57455 - 8.23244I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.749080 - 0.765100I$	$5.60971 + 1.02097I$	$7.05881 + 0.21382I$
$a = 0.129349 - 1.222592I$		
$b = 0.61597 + 1.72869I$		
$u = 0.749080 + 0.765100I$	$5.60971 - 1.02097I$	$7.05881 - 0.21382I$
$a = 0.129349 + 1.222592I$		
$b = 0.61597 - 1.72869I$		
$u = 1.035794 - 0.563745I$	$4.92535 + 7.92322I$	$5.81282 - 4.97707I$
$a = -1.135220 + 0.231350I$		
$b = 0.457170 - 1.082787I$		
$u = 1.035794 + 0.563745I$	$4.92535 - 7.92322I$	$5.81282 + 4.97707I$
$a = -1.135220 - 0.231350I$		
$b = 0.457170 + 1.082787I$		

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^{11} + u^{10} + 3u^9 + 3u^8 + 5u^7 + 7u^6 + 5u^5 + 8u^4 + 3u^3 + 5u^2 + u + 1)$ $(u^{44} + 8u^{42} + \dots - 28u + 19)$
c_2	$(u^{11} + 5u^{10} + \dots - 9u - 1)(u^{44} + 16u^{43} + \dots + 3928u + 361)$
c_3	$(u^{11} - u^{10} - 2u^9 - u^8 + 2u^6 + 5u^5 - 2u^4 + 2u^3 - 4u^2 - 1)$ $(u^{44} + 4u^{43} + \dots + 13u + 1)$
c_4	$(u^{11} + u^{10} + 5u^9 + 5u^8 + 9u^7 + 8u^6 + 7u^5 + 6u^4 + 2u^3 + 4u^2 + 1)$ $(u^{44} + 2u^{43} + \dots - 11u - 1)$
c_5	$(u^{11} + u^{10} + 5u^9 + 5u^8 + 9u^7 + 8u^6 + 7u^5 + 6u^4 + 2u^3 + 4u^2 + 1)$ $(u^{44} + 2u^{43} + \dots - 11u - 1)$
c_6	$(u^{11} - u^{10} + 3u^9 - 3u^8 + 5u^7 - 7u^6 + 5u^5 - 8u^4 + 3u^3 - 5u^2 + u - 1)$ $(u^{44} + 8u^{42} + \dots - 28u + 19)$
c_7	$(u^{11} - 2u^{10} - 3u^9 + 8u^8 - 10u^6 + 7u^5 + 3u^4 - 6u^3 + 2u^2 + 2u - 1)$ $(u^{44} + u^{43} + \dots - 41u + 11)$
c_8	$(u^{11} - u^{10} + 5u^9 - 5u^8 + 9u^7 - 8u^6 + 7u^5 - 6u^4 + 2u^3 - 4u^2 - 1)$ $(u^{44} + 2u^{43} + \dots - 11u - 1)$
c_9	$(u^{11} + 4u^9 + 2u^8 + 2u^7 + 5u^6 - 2u^5 + u^3 - 2u^2 + u + 1)$ $(u^{44} + u^{43} + \dots + 14u - 1)$
c_{10}	$(u^{11} + 2u^{10} - 3u^9 - 8u^8 + 10u^6 + 7u^5 - 3u^4 - 6u^3 - 2u^2 + 2u + 1)$ $(u^{44} + u^{43} + \dots - 41u + 11)$
c_{11}	$(u^{11} - u^{10} - 4u^9 + 6u^8 + 4u^7 - 12u^6 + 7u^5 + 6u^4 - 7u^3 - u^2 + 3u - 1)$ $(u^{44} + 2u^{43} + \dots + 12u - 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_6	$(y^{11} + 5y^{10} + \dots - 9y - 1)(y^{44} + 16y^{43} + \dots + 3928y + 361)$
c_2	$(y^{11} + y^{10} + \dots + 11y - 1)(y^{44} + 24y^{43} + \dots - 363932y + 130321)$
c_3	$(y^{11} - 5y^{10} + \dots - 8y - 1)(y^{44} - 42y^{43} + \dots - 5y + 1)$
c_4	$(y^{11} + 9y^{10} + \dots - 8y - 1)(y^{44} + 12y^{43} + \dots - 37y + 1)$
c_5, c_8	$(y^{11} + 9y^{10} + \dots - 8y - 1)(y^{44} + 12y^{43} + \dots - 37y + 1)$
c_7	$(y^{11} - 10y^{10} + \dots + 8y - 1)(y^{44} - 15y^{43} + \dots - 2869y + 121)$
c_9	$(y^{11} + 8y^{10} + \dots + 5y - 1)(y^{44} + 7y^{43} + \dots - 54y + 1)$
c_{10}	$(y^{11} - 10y^{10} + \dots + 8y - 1)(y^{44} - 15y^{43} + \dots - 2869y + 121)$
c_{11}	$(y^{11} - 9y^{10} + \dots + 7y - 1)(y^{44} - 38y^{43} + \dots - 96y + 1)$