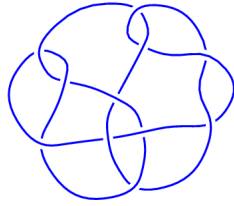
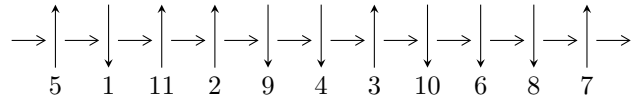


11a₅₂ (K11a₅₂)

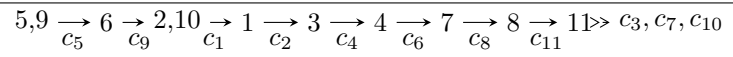


1

Arc Sequences



Solving Sequence



Representation Ideals

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

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

$$I_2^u = \langle u^{70} + 2u^{69} + \dots + 7u + 1, 4.29315 \times 10^{70}u^{69} + 9.25186 \times 10^{70}u^{68} + \dots + 4.17991 \times 10^{70}b + 8.65097 \times 10^{70} \\ - 6.25102 \times 10^{70}u^{69} - 1.20643 \times 10^{71}u^{68} + \dots + 4.17991 \times 10^{70}a - 3.98376 \times 10^{71} \rangle$$

There are 2 irreducible components with 72 representations.

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

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

(i) Arc colorings

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

$$a_9 = \begin{pmatrix} u + 1 \\ -3u - 1 \end{pmatrix}$$

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

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

$$a_{10} = \begin{pmatrix} 0 \\ -u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ -u - 1 \end{pmatrix}$$

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

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

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

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

$$a_{11} = \begin{pmatrix} -u - 1 \\ u + 1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u - 1 \\ u + 1 \end{pmatrix}$$

(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
$u = -0.500000 - 0.866025I$		
$a = 0.500000 - 0.866025I$	$-1.64493 + 2.02988I$	$-3.00000 - 3.46410I$
$b = 0.500000 + 2.59808I$		
$u = -0.500000 + 0.866025I$		
$a = 0.500000 + 0.866025I$	$-1.64493 - 2.02988I$	$-3.00000 + 3.46410I$
$b = 0.500000 - 2.59808I$		

$$\text{II. } I_2^u = \langle u^{70} + 2u^{69} + \dots + 7u + 1, 4.29 \times 10^{70}u^{69} + 9.25 \times 10^{70}u^{68} + \dots + 4.18 \times 10^{70}b + 8.65 \times 10^{70}, -6.25 \times 10^{70}u^{69} - 1.21 \times 10^{71}u^{68} + \dots + 4.18 \times 10^{70}a - 3.98 \times 10^{71} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_5 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 1.49549u^{69} + 2.88627u^{68} + \dots + 11.1491u + 9.53072 \\ -1.02709u^{69} - 2.21341u^{68} + \dots - 4.32788u - 2.06965 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 1.48730u^{69} + 2.86554u^{68} + \dots + 1.33091u + 8.39096 \\ -0.657446u^{69} - 1.05978u^{68} + \dots - 4.77620u - 2.02891 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.273410u^{69} - 0.519559u^{68} + \dots + 0.135853u + 0.316491 \\ -0.0101833u^{69} - 0.253892u^{68} + \dots + 1.28544u - 0.0243111 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 1 \\ u^2 \end{pmatrix} \\ a_3 &= \begin{pmatrix} u^2 + 1 \\ u^4 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_7 &= \begin{pmatrix} 1.52549u^{69} + 3.20894u^{68} + \dots + 3.18319u + 8.53702 \\ -0.695638u^{69} - 1.40318u^{68} + \dots - 6.62848u - 2.17497 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 1.32926u^{69} + 2.65160u^{68} + \dots - 1.32082u + 6.55666 \\ -0.448125u^{69} - 0.872997u^{68} + \dots - 6.11574u - 2.04777 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -1.90147u^{69} - 3.00687u^{68} + \dots - 17.2798u - 7.54591 \\ 0.445769u^{69} + 0.536167u^{68} + \dots + 2.09334u + 1.10540 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -1.90147u^{69} - 3.00687u^{68} + \dots - 17.2798u - 7.54591 \\ 0.445769u^{69} + 0.536167u^{68} + \dots + 2.09334u + 1.10540 \end{pmatrix} \end{aligned}$$

(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
$u = -0.954425 - 0.553357I$ $a = 1.150122 + 0.165836I$ $b = 0.866121 - 0.472624I$	$7.36308 - 10.70735I$	$3.01709 + 6.14665I$
$u = -0.954425 + 0.553357I$ $a = 1.150122 - 0.165836I$ $b = 0.866121 + 0.472624I$	$7.36308 + 10.70735I$	$3.01709 - 6.14665I$
$u = -0.933958 - 0.585997I$ $a = 0.166743 - 1.054817I$ $b = -0.229351 + 0.766410I$	$8.09011 - 4.47407I$	$4.24940 + 1.33305I$
$u = -0.933958 + 0.585997I$ $a = 0.166743 + 1.054817I$ $b = -0.229351 - 0.766410I$	$8.09011 + 4.47407I$	$4.24940 - 1.33305I$
$u = -0.776298 - 0.488443I$ $a = -1.160648 + 0.295201I$ $b = -0.786256 - 0.488134I$	$0.03545 - 5.59321I$	$-0.93885 + 5.88908I$
$u = -0.776298 + 0.488443I$ $a = -1.160648 - 0.295201I$ $b = -0.786256 + 0.488134I$	$0.03545 + 5.59321I$	$-0.93885 - 5.88908I$
$u = -0.725223 - 1.096767I$ $a = 0.886974 - 0.091424I$ $b = -0.885386 - 0.136936I$	$6.51009 + 10.55953I$	$2.16375 - 5.53235I$
$u = -0.725223 + 1.096767I$ $a = 0.886974 + 0.091424I$ $b = -0.885386 + 0.136936I$	$6.51009 - 10.55953I$	$2.16375 + 5.53235I$
$u = -0.720698 - 0.648573I$ $a = 0.457752 + 0.676305I$ $b = -0.223376 - 0.557342I$	$3.13610 - 1.75909I$	$5.49516 + 1.80706I$
$u = -0.720698 + 0.648573I$ $a = 0.457752 - 0.676305I$ $b = -0.223376 + 0.557342I$	$3.13610 + 1.75909I$	$5.49516 - 1.80706I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.719263 - 1.118333I$ $a = -0.080090 - 0.972006I$ $b = -0.33627 + 3.01349I$	$5.6142 + 16.8243I$	$0.71174 - 10.03515I$
$u = -0.719263 + 1.118333I$ $a = -0.080090 + 0.972006I$ $b = -0.33627 - 3.01349I$	$5.6142 - 16.8243I$	$0.71174 + 10.03515I$
$u = -0.697500 - 0.803718I$ $a = 0.178031 + 1.124480I$ $b = 0.187669 - 1.075527I$	$6.85272 + 3.28181I$	$6.45434 - 3.67109I$
$u = -0.697500 + 0.803718I$ $a = 0.178031 - 1.124480I$ $b = 0.187669 + 1.075527I$	$6.85272 - 3.28181I$	$6.45434 + 3.67109I$
$u = -0.689342 - 0.894211I$ $a = -1.035608 - 0.003596I$ $b = 0.791092 + 0.192095I$	$6.57916 + 2.04356I$	$5.98703 - 2.65335I$
$u = -0.689342 + 0.894211I$ $a = -1.035608 + 0.003596I$ $b = 0.791092 - 0.192095I$	$6.57916 - 2.04356I$	$5.98703 + 2.65335I$
$u = -0.685303 - 0.740870I$ $a = -1.282462 + 0.185307I$ $b = -0.336677 + 0.039372I$	$6.10986 - 3.15378I$	$5.18638 + 2.28891I$
$u = -0.685303 + 0.740870I$ $a = -1.282462 - 0.185307I$ $b = -0.336677 - 0.039372I$	$6.10986 + 3.15378I$	$5.18638 - 2.28891I$
$u = -0.664262 - 0.939808I$ $a = 0.030828 + 1.144787I$ $b = 0.24220 - 2.62804I$	$5.50755 + 8.37088I$	$3.57481 - 8.42575I$
$u = -0.664262 + 0.939808I$ $a = 0.030828 - 1.144787I$ $b = 0.24220 + 2.62804I$	$5.50755 - 8.37088I$	$3.57481 + 8.42575I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.661839 - 0.998275I$ $a = -0.592526 - 0.385144I$ $b = 0.462170 + 0.535095I$	$2.09416 + 7.06733I$	$3.10109 - 7.21627I$
$u = -0.661839 + 0.998275I$ $a = -0.592526 + 0.385144I$ $b = 0.462170 - 0.535095I$	$2.09416 - 7.06733I$	$3.10109 + 7.21627I$
$u = -0.642942 - 1.069942I$ $a = -0.250713 + 0.894107I$ $b = -0.09210 - 2.87809I$	$-1.65551 + 10.94813I$	$-3.48280 - 9.65202I$
$u = -0.642942 + 1.069942I$ $a = -0.250713 - 0.894107I$ $b = -0.09210 + 2.87809I$	$-1.65551 - 10.94813I$	$-3.48280 + 9.65202I$
$u = -0.581386 - 0.947779I$ $a = 0.768796 - 0.774844I$ $b = 0.32121 + 1.82192I$	$-1.93471 + 3.15779I$	$-1.32353 - 9.16120I$
$u = -0.581386 + 0.947779I$ $a = 0.768796 + 0.774844I$ $b = 0.32121 - 1.82192I$	$-1.93471 - 3.15779I$	$-1.32353 + 9.16120I$
$u = -0.546606 - 0.763209I$ $a = 0.599370 - 1.121498I$ $b = 0.04744 + 2.10166I$	$-1.30105 + 1.37775I$	$4.35855 + 4.78657I$
$u = -0.546606 + 0.763209I$ $a = 0.599370 + 1.121498I$ $b = 0.04744 - 2.10166I$	$-1.30105 - 1.37775I$	$4.35855 - 4.78657I$
$u = -0.225350 - 0.984742I$ $a = -0.212970 - 1.060490I$ $b = -0.72523 + 2.48015I$	$-3.99310 + 2.18696I$	$-8.57359 - 2.22609I$
$u = -0.225350 + 0.984742I$ $a = -0.212970 + 1.060490I$ $b = -0.72523 - 2.48015I$	$-3.99310 - 2.18696I$	$-8.57359 + 2.22609I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.172499 - 0.029720I$		
$a = 4.63826 - 1.73204I$	$-1.46844 + 0.34695I$	$-5.88246 - 0.51749I$
$b = -0.486621 + 0.483308I$		
$u = -0.172499 + 0.029720I$		
$a = 4.63826 + 1.73204I$	$-1.46844 - 0.34695I$	$-5.88246 + 0.51749I$
$b = -0.486621 - 0.483308I$		
$u = -0.036237 - 1.176333I$		
$a = -0.166737 + 0.841040I$	$-5.59225 - 3.69663I$	$-9.44807 + 5.64116I$
$b = 0.27535 - 2.82107I$		
$u = -0.036237 + 1.176333I$		
$a = -0.166737 - 0.841040I$	$-5.59225 + 3.69663I$	$-9.44807 - 5.64116I$
$b = 0.27535 + 2.82107I$		
$u = 0.006007 - 0.938840I$		
$a = 0.583105 - 0.275897I$	$-1.97330 - 1.67417I$	$-2.89034 + 3.89687I$
$b = -0.419174 - 0.345013I$		
$u = 0.006007 + 0.938840I$		
$a = 0.583105 + 0.275897I$	$-1.97330 + 1.67417I$	$-2.89034 - 3.89687I$
$b = -0.419174 + 0.345013I$		
$u = 0.093994 - 0.803000I$		
$a = -0.69744 + 1.23795I$	$1.51661 - 4.29217I$	$-0.31628 + 5.07111I$
$b = 1.19255 - 1.55778I$		
$u = 0.093994 + 0.803000I$		
$a = -0.69744 - 1.23795I$	$1.51661 + 4.29217I$	$-0.31628 - 5.07111I$
$b = 1.19255 + 1.55778I$		
$u = 0.116249 - 1.319014I$		
$a = 0.493322 - 0.775316I$	$-0.06465 - 8.51032I$	$-2.47657 + 8.97656I$
$b = 0.01428 + 2.29159I$		
$u = 0.116249 + 1.319014I$		
$a = 0.493322 + 0.775316I$	$-0.06465 + 8.51032I$	$-2.47657 - 8.97656I$
$b = 0.01428 - 2.29159I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.174351 - 1.283412I$ $a = -0.674289 - 0.508970I$ $b = 0.303026 + 1.195672I$	$0.52470 - 2.76607I$	$-1.22752 + 4.10691I$
$u = 0.174351 + 1.283412I$ $a = -0.674289 + 0.508970I$ $b = 0.303026 - 1.195672I$	$0.52470 + 2.76607I$	$-1.22752 - 4.10691I$
$u = 0.248336 - 0.844356I$ $a = 1.016255 + 0.682065I$ $b = -0.15852 - 2.43203I$	$1.83973 + 0.97289I$	$2.18559 - 1.15743I$
$u = 0.248336 + 0.844356I$ $a = 1.016255 - 0.682065I$ $b = -0.15852 + 2.43203I$	$1.83973 - 0.97289I$	$2.18559 + 1.15743I$
$u = 0.356108 - 0.054613I$ $a = 2.09936 + 2.52412I$ $b = 0.462646 + 0.124379I$	$3.87537 - 2.94930I$	$-1.97198 + 2.94182I$
$u = 0.356108 + 0.054613I$ $a = 2.09936 - 2.52412I$ $b = 0.462646 - 0.124379I$	$3.87537 + 2.94930I$	$-1.97198 - 2.94182I$
$u = 0.425524 - 0.842724I$ $a = -0.433995 - 0.557687I$ $b = -1.89420 - 0.74507I$	$-1.06799 - 1.58770I$	$1.27174 + 9.61226I$
$u = 0.425524 + 0.842724I$ $a = -0.433995 + 0.557687I$ $b = -1.89420 + 0.74507I$	$-1.06799 + 1.58770I$	$1.27174 - 9.61226I$
$u = 0.481951 - 0.889150I$ $a = -0.317059 - 0.715177I$ $b = 1.32678 + 5.33597I$	$-1.27782 - 2.20300I$	$28.2888 - 15.0727I$
$u = 0.481951 + 0.889150I$ $a = -0.317059 + 0.715177I$ $b = 1.32678 - 5.33597I$	$-1.27782 + 2.20300I$	$28.2888 + 15.0727I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.578878 - 0.878433I$ $a = -0.134382 + 1.109729I$ $b = -2.70748 - 2.77752I$	$3.41570 - 5.19038I$	$-13.1775 - 6.7973I$
$u = 0.578878 + 0.878433I$ $a = -0.134382 - 1.109729I$ $b = -2.70748 + 2.77752I$	$3.41570 + 5.19038I$	$-13.1775 + 6.7973I$
$u = 0.583169 - 0.848078I$ $a = 1.092123 + 0.269922I$ $b = -0.65494 + 2.36227I$	$3.51311 + 0.58844I$	$-14.6540 - 7.5568I$
$u = 0.583169 + 0.848078I$ $a = 1.092123 - 0.269922I$ $b = -0.65494 - 2.36227I$	$3.51311 - 0.58844I$	$-14.6540 + 7.5568I$
$u = 0.583671 - 1.124247I$ $a = 0.146048 + 0.647206I$ $b = 0.36300 - 2.53812I$	$-1.06806 - 4.56339I$	$-2.77563 + 10.69902I$
$u = 0.583671 + 1.124247I$ $a = 0.146048 - 0.647206I$ $b = 0.36300 + 2.53812I$	$-1.06806 + 4.56339I$	$-2.77563 - 10.69902I$
$u = 0.626147 - 0.914671I$ $a = 0.274202 - 0.021237I$ $b = 0.176960 - 0.315393I$	$0.59157 - 2.55234I$	$2.38321 + 1.51119I$
$u = 0.626147 + 0.914671I$ $a = 0.274202 + 0.021237I$ $b = 0.176960 + 0.315393I$	$0.59157 + 2.55234I$	$2.38321 - 1.51119I$
$u = 0.627763 - 0.219249I$ $a = 0.762541 - 0.231325I$ $b = 0.624904 - 0.241870I$	$1.45022 - 0.18071I$	$7.16773 - 1.07123I$
$u = 0.627763 + 0.219249I$ $a = 0.762541 + 0.231325I$ $b = 0.624904 + 0.241870I$	$1.45022 + 0.18071I$	$7.16773 + 1.07123I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.760996 - 0.715752I$ $a = 0.253472 + 0.580095I$ $b = 0.443597 - 0.627153I$	$1.05262 - 2.72622I$	$4.23016 + 8.33460I$
$u = 0.760996 + 0.715752I$ $a = 0.253472 - 0.580095I$ $b = 0.443597 + 0.627153I$	$1.05262 + 2.72622I$	$4.23016 - 8.33460I$
$u = 0.78729 - 1.17932I$ $a = 0.091695 - 0.844947I$ $b = 0.34565 + 2.50453I$	$4.61940 - 7.83060I$	$4.38555 + 10.26240I$
$u = 0.78729 + 1.17932I$ $a = 0.091695 + 0.844947I$ $b = 0.34565 - 2.50453I$	$4.61940 + 7.83060I$	$4.38555 - 10.26240I$
$u = 0.815235 - 1.138532I$ $a = -0.811045 - 0.159049I$ $b = 0.154524 + 0.019192I$	$4.87181 - 1.93616I$	$5.33797 + 4.75512I$
$u = 0.815235 + 1.138532I$ $a = -0.811045 + 0.159049I$ $b = 0.154524 - 0.019192I$	$4.87181 + 1.93616I$	$5.33797 - 4.75512I$
$u = 1.082267 - 0.519895I$ $a = -0.389488 - 0.919470I$ $b = -0.050529 + 1.168874I$	$6.73681 - 4.83956I$	$9.12593 + 6.03580I$
$u = 1.082267 + 0.519895I$ $a = -0.389488 + 0.919470I$ $b = -0.050529 - 1.168874I$	$6.73681 + 4.83956I$	$9.12593 - 6.03580I$
$u = 1.085196 - 0.452446I$ $a = -0.949553 + 0.340609I$ $b = -0.615057 - 0.596176I$	$6.80863 + 1.13129I$	$9.46306 + 0.26470I$
$u = 1.085196 + 0.452446I$ $a = -0.949553 - 0.340609I$ $b = -0.615057 + 0.596176I$	$6.80863 - 1.13129I$	$9.46306 - 0.26470I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2 + u + 1)(u^{70} + 2u^{69} + \dots + 7u + 1)$
c_2	$(u^2 + u + 1)(u^{70} + 26u^{69} + \dots - 61u + 1)$
c_3	$u^2(u^{70} + 7u^{69} + \dots - 4u + 4)$
c_4	$(u^2 - u + 1)(u^{70} + 2u^{69} + \dots + 7u + 1)$
c_5	$(u - 1)^2(u^{70} + 3u^{69} + \dots - 2u + 1)$
c_6	$(u^2 - u + 1)(u^{70} + 4u^{69} + \dots + 14859u + 4643)$
c_7	$(u^2 - u + 1)(u^{70} + 2u^{69} + \dots - 3989u + 641)$
c_8	$(u - 1)^2(u^{70} + 21u^{69} + \dots + 8u + 1)$
c_9	$(u + 1)^2(u^{70} + 3u^{69} + \dots - 2u + 1)$
c_{10}	$(u + 1)^2(u^{70} + 21u^{69} + \dots + 8u + 1)$
c_{11}	$(u + 1)^2(u^{70} + 7u^{69} + \dots - 4u^2 + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y^2 + y + 1)(y^{70} + 26y^{69} + \dots - 61y + 1)$
c_2	$(y^2 + y + 1)(y^{70} + 38y^{69} + \dots - 1741y + 1)$
c_3	$y^2(y^{70} - 15y^{69} + \dots - 328y + 16)$
c_5	$(y - 1)^2(y^{70} - 21y^{69} + \dots - 8y + 1)$
c_6	$(y^2 + y + 1)(y^{70} - 46y^{69} + \dots + 5.12637 \times 10^8 y + 2.15574 \times 10^7)$
c_7	$(y^2 + y + 1)(y^{70} - 90y^{69} + \dots - 1.22379 \times 10^7 y + 410881)$
c_8, c_{10}	$(y - 1)^2(y^{70} + 59y^{69} + \dots + 128y + 1)$
c_9	$(y - 1)^2(y^{70} - 21y^{69} + \dots - 8y + 1)$
c_{11}	$(y - 1)^2(y^{70} - 9y^{69} + \dots - 8y + 1)$