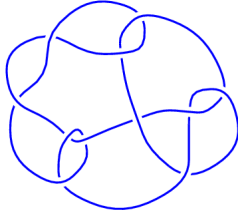
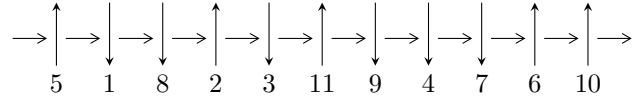


11a<sub>11</sub> (K11a<sub>11</sub>)

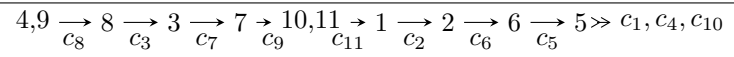


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

$$I = I_1^u \cap I_1^v$$

$$I_1^u = \langle u^{58} + u^{57} + \dots - 4u + 4, -3.09096 \times 10^{31}u^{57} - 6.61165 \times 10^{31}u^{56} + \dots + 4.71586 \times 10^{31}b - 1.87421 \times 10^{31} \\ 6.39352 \times 10^{31}u^{57} + 8.81969 \times 10^{31}u^{56} + \dots + 2.35793 \times 10^{31}a - 3.61858 \times 10^{32} \rangle$$

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

There are 2 irreducible components with 60 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>”

$$\begin{aligned} & \mathbf{I. } I_1^u = \\ & \langle u^{58} + u^{57} + \dots - 4u + 4, -3.09 \times 10^{31} u^{57} - 6.61 \times 10^{31} u^{56} + \dots + 4.72 \times 10^{31} b - \\ & 1.87 \times 10^{32}, 6.39 \times 10^{31} u^{57} + 8.82 \times 10^{31} u^{56} + \dots + 2.36 \times 10^{31} a - 3.62 \times 10^{32} \rangle \end{aligned}$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} u \\ u \end{pmatrix}$$

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

$$a_7 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^3 \\ u^5 - u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -2.71150u^{57} - 3.74044u^{56} + \dots + 2.09467u + 15.3464 \\ 0.655440u^{57} + 1.40200u^{56} + \dots - 2.24430u + 3.97426 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -2.70789u^{57} - 4.52920u^{56} + \dots + 6.30614u + 15.3067 \\ 0.656171u^{57} + 1.40311u^{56} + \dots + 0.932406u - 1.22587 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 2.94156u^{57} + 5.06615u^{56} + \dots - 14.3092u - 16.1539 \\ 1.30694u^{57} + 2.20766u^{56} + \dots - 3.11530u - 4.20133 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 2.36713u^{57} + 4.08110u^{56} + \dots - 1.82738u - 9.24737 \\ -0.340761u^{57} - 0.448100u^{56} + \dots + 4.47876u + 6.05934 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 2.83660u^{57} + 4.52459u^{56} + \dots - 1.25804u - 7.48548 \\ -0.527460u^{57} - 1.40772u^{56} + \dots + 4.11569u + 9.04710 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 2.83660u^{57} + 4.52459u^{56} + \dots - 1.25804u - 7.48548 \\ -0.527460u^{57} - 1.40772u^{56} + \dots + 4.11569u + 9.04710 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $1.35369u^{57} + 2.48411u^{56} + \dots - 5.92434u - 3.41763$

(iv) Complex Volumes and Cusp Shapes

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.048561 - 0.067957I$		
$a = 0.559839 - 0.037746I$	$-5.05702 + 2.63543I$	$-8.96800 - 3.93457I$
$b = -0.685431 - 0.626108I$		
$u = -1.048561 + 0.067957I$		
$a = 0.559839 + 0.037746I$	$-5.05702 - 2.63543I$	$-8.96800 + 3.93457I$
$b = -0.685431 + 0.626108I$		
$u = -1.038689 - 0.260534I$		
$a = 0.382607 + 0.196103I$	$-4.36361 - 4.61978I$	$-7.52611 + 4.69531I$
$b = -0.476634 - 0.716148I$		
$u = -1.038689 + 0.260534I$		
$a = 0.382607 - 0.196103I$	$-4.36361 + 4.61978I$	$-7.52611 - 4.69531I$
$b = -0.476634 + 0.716148I$		
$u = -1.025183 - 0.826072I$		
$a = 1.56413 + 1.82853I$	$5.5002 - 14.7239I$	$1.22769 + 9.89191I$
$b = 3.60552 - 0.60183I$		
$u = -1.025183 + 0.826072I$		
$a = 1.56413 - 1.82853I$	$5.5002 + 14.7239I$	$1.22769 - 9.89191I$
$b = 3.60552 + 0.60183I$		
$u = -0.990315 - 0.389853I$		
$a = 0.911414 + 0.955546I$	$-0.45426 - 4.86179I$	$-0.56072 + 6.44358I$
$b = 0.229881 + 0.238137I$		
$u = -0.990315 + 0.389853I$		
$a = 0.911414 - 0.955546I$	$-0.45426 + 4.86179I$	$-0.56072 - 6.44358I$
$b = 0.229881 - 0.238137I$		
$u = -0.988463 - 0.757489I$		
$a = 1.39536 + 1.73246I$	$2.01751 - 7.25755I$	$-2.01563 + 5.53872I$
$b = 2.91390 - 0.15577I$		
$u = -0.988463 + 0.757489I$		
$a = 1.39536 - 1.73246I$	$2.01751 + 7.25755I$	$-2.01563 - 5.53872I$
$b = 2.91390 + 0.15577I$		

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.944641 - 0.777587I$ $a = -0.202921 + 0.404867I$ $b = -0.0521931 + 0.0917099I$	$4.07167 - 4.42773I$	$1.08988 + 2.76799I$
$u = -0.944641 + 0.777587I$ $a = -0.202921 - 0.404867I$ $b = -0.0521931 - 0.0917099I$	$4.07167 + 4.42773I$	$1.08988 - 2.76799I$
$u = -0.898879 - 0.794879I$ $a = -2.27583 - 1.17813I$ $b = -2.55245 + 1.82789I$	$6.42683 - 5.27485I$	$2.53353 + 4.61239I$
$u = -0.898879 + 0.794879I$ $a = -2.27583 + 1.17813I$ $b = -2.55245 - 1.82789I$	$6.42683 + 5.27485I$	$2.53353 - 4.61239I$
$u = -0.881786 - 0.800253I$ $a = 1.22945 + 1.96308I$ $b = 3.32632 + 0.91591I$	$6.48025 - 0.70893I$	$2.72501 + 1.07342I$
$u = -0.881786 + 0.800253I$ $a = 1.22945 - 1.96308I$ $b = 3.32632 - 0.91591I$	$6.48025 + 0.70893I$	$2.72501 - 1.07342I$
$u = -0.826470 - 0.811218I$ $a = -0.254122 + 0.271069I$ $b = -0.379361 + 0.111056I$	$4.43701 - 1.53415I$	$1.72366 + 2.51421I$
$u = -0.826470 + 0.811218I$ $a = -0.254122 - 0.271069I$ $b = -0.379361 - 0.111056I$	$4.43701 + 1.53415I$	$1.72366 - 2.51421I$
$u = -0.792798 - 0.939540I$ $a = -1.87151 - 1.33967I$ $b = -3.41570 + 0.60471I$	$6.24695 + 8.22888I$	$2.36913 - 5.79102I$
$u = -0.792798 + 0.939540I$ $a = -1.87151 + 1.33967I$ $b = -3.41570 - 0.60471I$	$6.24695 - 8.22888I$	$2.36913 + 5.79102I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.746191 - 0.812452I$ $a = -1.94463 - 1.01558I$ $b = -2.38492 + 0.69473I$	$2.74272 + 1.35672I$	$-0.686842 - 0.658171I$
$u = -0.746191 + 0.812452I$ $a = -1.94463 + 1.01558I$ $b = -2.38492 - 0.69473I$	$2.74272 - 1.35672I$	$-0.686842 + 0.658171I$
$u = -0.732349 - 0.313831I$ $a = 0.221327 + 1.099831I$ $b = -0.266285 + 1.344798I$	$1.56865 - 3.63401I$	$0.50067 + 8.81328I$
$u = -0.732349 + 0.313831I$ $a = 0.221327 - 1.099831I$ $b = -0.266285 - 1.344798I$	$1.56865 + 3.63401I$	$0.50067 - 8.81328I$
$u = -0.536435 - 0.432411I$ $a = -2.17911 + 0.03542I$ $b = -0.543168 + 0.254424I$	$2.16202 + 0.77457I$	$3.14237 + 2.08066I$
$u = -0.536435 + 0.432411I$ $a = -2.17911 - 0.03542I$ $b = -0.543168 - 0.254424I$	$2.16202 - 0.77457I$	$3.14237 - 2.08066I$
$u = -0.327071 - 0.663667I$ $a = -1.233135 - 0.055842I$ $b = -0.770460 - 0.508189I$	$1.77616 + 0.94992I$	$4.44755 - 1.71410I$
$u = -0.327071 + 0.663667I$ $a = -1.233135 + 0.055842I$ $b = -0.770460 + 0.508189I$	$1.77616 - 0.94992I$	$4.44755 + 1.71410I$
$u = 0.036590 - 0.771690I$ $a = 0.350529 - 0.136230I$ $b = 0.093556 - 1.021657I$	$-0.81275 + 1.40752I$	$-3.05190 - 0.70072I$
$u = 0.036590 + 0.771690I$ $a = 0.350529 + 0.136230I$ $b = 0.093556 + 1.021657I$	$-0.81275 - 1.40752I$	$-3.05190 + 0.70072I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.278867 - 0.850545I$		
$a = 0.874500 - 0.473068I$	$-0.11517 - 4.84774I$	$-0.96980 + 7.14409I$
$b = 0.92049 - 1.15445I$		
$u = 0.278867 + 0.850545I$		
$a = 0.874500 + 0.473068I$	$-0.11517 + 4.84774I$	$-0.96980 - 7.14409I$
$b = 0.92049 + 1.15445I$		
$u = 0.291033 - 0.534414I$		
$a = 0.0153111 - 0.0176376I$	$-0.32061 + 1.54716I$	$-2.16073 - 4.65280I$
$b = 0.339612 - 0.487861I$		
$u = 0.291033 + 0.534414I$		
$a = 0.0153111 + 0.0176376I$	$-0.32061 - 1.54716I$	$-2.16073 + 4.65280I$
$b = 0.339612 + 0.487861I$		
$u = 0.649706 - 0.200927I$		
$a = 0.157184 + 0.869311I$	$1.09083 - 1.19632I$	$-2.67942 - 2.86295I$
$b = 0.95807 + 1.28027I$		
$u = 0.649706 + 0.200927I$		
$a = 0.157184 - 0.869311I$	$1.09083 + 1.19632I$	$-2.67942 + 2.86295I$
$b = 0.95807 - 1.28027I$		
$u = 0.715542 - 0.182951I$		
$a = 2.75787 - 0.05269I$	$0.90066 + 2.88860I$	$-3.50834 - 6.47238I$
$b = -0.138663 + 0.400271I$		
$u = 0.715542 + 0.182951I$		
$a = 2.75787 + 0.05269I$	$0.90066 - 2.88860I$	$-3.50834 + 6.47238I$
$b = -0.138663 - 0.400271I$		
$u = 0.768453 - 0.836694I$		
$a = 0.280171 + 0.206896I$	$2.81999 - 3.64889I$	$-0.72605 + 2.41695I$
$b = 0.535760 + 0.093490I$		
$u = 0.768453 + 0.836694I$		
$a = 0.280171 - 0.206896I$	$2.81999 + 3.64889I$	$-0.72605 - 2.41695I$
$b = 0.535760 - 0.093490I$		

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.813150 - 0.906222I$		
$a = 1.95775 - 1.29698I$	$8.06195 - 2.97069I$	$5.15213 + 1.06762I$
$b = 3.23685 + 0.88444I$		
$u = 0.813150 + 0.906222I$		
$a = 1.95775 + 1.29698I$	$8.06195 + 2.97069I$	$5.15213 - 1.06762I$
$b = 3.23685 - 0.88444I$		
$u = 0.870741 - 0.827532I$		
$a = 2.17780 - 1.20916I$	$8.16003 + 0.02626I$	$5.24638 + 0.26541I$
$b = 2.77149 + 1.54849I$		
$u = 0.870741 + 0.827532I$		
$a = 2.17780 + 1.20916I$	$8.16003 - 0.02626I$	$5.24638 - 0.26541I$
$b = 2.77149 - 1.54849I$		
$u = 0.903498 - 0.662172I$		
$a = 0.082491 + 0.331374I$	$-1.07636 + 2.53447I$	$-5.45479 - 2.49966I$
$b = 0.161407 - 0.181206I$		
$u = 0.903498 + 0.662172I$		
$a = 0.082491 - 0.331374I$	$-1.07636 - 2.53447I$	$-5.45479 + 2.49966I$
$b = 0.161407 + 0.181206I$		
$u = 0.913527 - 0.181757I$		
$a = -0.301584 + 0.019035I$	$-1.79712 + 0.58239I$	$-4.29390 - 0.53701I$
$b = 0.554517 - 0.572023I$		
$u = 0.913527 + 0.181757I$		
$a = -0.301584 - 0.019035I$	$-1.79712 - 0.58239I$	$-4.29390 + 0.53701I$
$b = 0.554517 + 0.572023I$		
$u = 0.920258 - 0.810339I$		
$a = -1.32251 + 1.93351I$	$8.00524 + 6.08837I$	$4.76268 - 5.76942I$
$b = -3.45813 + 0.53171I$		
$u = 0.920258 + 0.810339I$		
$a = -1.32251 - 1.93351I$	$8.00524 - 6.08837I$	$4.76268 + 5.76942I$
$b = -3.45813 - 0.53171I$		

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.987501 - 0.771501I$ $a = 0.186336 + 0.456524I$ $b = -0.0758896 + 0.0706432I$	$2.14956 + 9.66192I$	$-1.84579 - 7.09878I$
$u = 0.987501 + 0.771501I$ $a = 0.186336 - 0.456524I$ $b = -0.0758896 - 0.0706432I$	$2.14956 - 9.66192I$	$-1.84579 + 7.09878I$
$u = 0.998202 - 0.822274I$ $a = -1.50191 + 1.85613I$ $b = -3.58439 - 0.30006I$	$7.47129 + 9.35808I$	$4.04876 - 5.69041I$
$u = 0.998202 + 0.822274I$ $a = -1.50191 - 1.85613I$ $b = -3.58439 + 0.30006I$	$7.47129 - 9.35808I$	$4.04876 + 5.69041I$
$u = 1.053535 - 0.258866I$ $a = -0.886093 + 0.610626I$ $b = 0.361952 + 0.187903I$	$-4.33981 + 1.99854I$	$-7.41077 - 3.19574I$
$u = 1.053535 + 0.258866I$ $a = -0.886093 - 0.610626I$ $b = 0.361952 - 0.187903I$	$-4.33981 - 1.99854I$	$-7.41077 + 3.19574I$
$u = 1.077230 - 0.420247I$ $a = -1.13071 + 0.90891I$ $b = -0.225654 - 0.241080I$	$-2.89029 + 9.39325I$	$-4.11066 - 9.87037I$
$u = 1.077230 + 0.420247I$ $a = -1.13071 - 0.90891I$ $b = -0.225654 + 0.241080I$	$-2.89029 - 9.39325I$	$-4.11066 + 9.87037I$



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

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

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

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

$$a_{10} = \begin{pmatrix} b+1 \\ 0 \end{pmatrix}$$

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

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

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

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

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

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

(ii) Obstruction class =  $-1$

(iii) Cusp Shapes =  $-4b + 1$

(iv) Complex Volumes and Cusp Shapes

Solution to $I_1^v$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 0.500000 - 0.866025I$	$1.64493 - 2.02988I$	$3.00000 + 3.46410I$
$a = 0$		
$b = -0.500000 - 0.866025I$		
$v = 0.500000 + 0.866025I$	$1.64493 + 2.02988I$	$3.00000 - 3.46410I$
$a = 0$		
$b = -0.500000 + 0.866025I$		

### III. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u^2 + u + 1)(u^{58} + 2u^{57} + \dots + 3u + 1)$
$c_2$	$(u^2 - u + 1)(u^{58} + 26u^{57} + \dots + 5u + 1)$
$c_3, c_8$	$u^2(u^{58} + u^{57} + \dots - 4u + 4)$
$c_4$	$(u^2 - u + 1)(u^{58} + 2u^{57} + \dots + 3u + 1)$
$c_5$	$(u^2 - u + 1)(u^{58} + 2u^{57} + \dots + 5u + 1)$
$c_6, c_{10}$	$(u - 1)^2(u^{58} + 3u^{57} + \dots + 2u + 1)$
$c_7, c_9$	$u^2(u^{58} + 15u^{57} + \dots + 168u + 16)$
$c_{11}$	$(u + 1)^2(u^{58} + 33u^{57} + \dots - 2u + 1)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_4$	$(y^2 + y + 1)(y^{58} + 26y^{57} + \dots + 5y + 1)$
$c_2$	$(y^2 + y + 1)(y^{58} + 14y^{57} + \dots + 29y + 1)$
$c_3, c_8$	$y^2(y^{58} - 15y^{57} + \dots - 168y + 16)$
$c_5$	$(y^2 + y + 1)(y^{58} + 2y^{57} + \dots + 53y + 1)$
$c_6, c_{10}$	$(y - 1)^2(y^{58} - 33y^{57} + \dots + 2y + 1)$
$c_7, c_9$	$y^2(y^{58} + 53y^{57} + \dots + 2784y + 256)$
$c_{11}$	$(y - 1)^2(y^{58} - 13y^{57} + \dots + 42y + 1)$