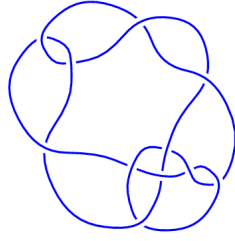
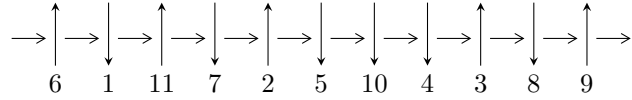


11a₁₆₇ (K11a₁₆₇)

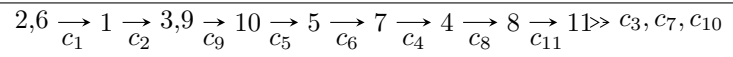


1

Arc Sequences



Solving Sequence



Representation Ideals

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

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

$$I_2^u = \langle u^{58} + 2u^{57} + \dots - u + 1, -9.20331 \times 10^{18}u^{57} - 1.37199 \times 10^{19}u^{56} + \dots + 3.39537 \times 10^{18}b - 4.21028 \times 10^{18}a - 7.03039 \times 10^{18}u^{57} + 1.85492 \times 10^{19}u^{56} + \dots + 3.39537 \times 10^{18}a + 2.49612 \times 10^{19} \rangle$$

There are 2 irreducible components with 60 representations.

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

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

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

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

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

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

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

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

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

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

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

$$\text{II. } I_2^u = \langle u^{58} + 2u^{57} + \dots - u + 1, -9.20 \times 10^{18}u^{57} - 1.37 \times 10^{19}u^{56} + \dots + 3.40 \times 10^{18}b - 4.21 \times 10^{18}, 7.03 \times 10^{18}u^{57} + 1.85 \times 10^{19}u^{56} + \dots + 3.40 \times 10^{18}a + 2.50 \times 10^{19} \rangle$$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u^2 + 1 \\ u^4 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -2.07058u^{57} - 5.46309u^{56} + \dots + 8.71905u - 7.35155 \\ 2.71055u^{57} + 4.04078u^{56} + \dots + 2.87153u + 1.24001 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0678518u^{57} - 1.33180u^{56} + \dots + 7.13402u - 4.56590 \\ 2.17215u^{57} + 3.03451u^{56} + \dots + 4.72602u + 0.0399380 \end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix} -u^5 - u \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.236838u^{57} - 1.43795u^{56} + \dots + 5.04652u - 4.51898 \\ 2.07684u^{57} + 2.44455u^{56} + \dots + 6.07889u - 0.359956 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -1.42519u^{57} - 1.02253u^{56} + \dots - 3.40758u - 0.311267 \\ 0.425182u^{57} - 1.40266u^{56} + \dots + 2.31128u - 1.00001 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -1.42519u^{57} - 1.02253u^{56} + \dots - 3.40758u - 0.311267 \\ 0.425182u^{57} - 1.40266u^{56} + \dots + 2.31128u - 1.00001 \end{pmatrix}$$

(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
$u = -0.910971 - 0.834834I$ $a = -1.39520 + 0.83245I$ $b = -0.16453 - 2.92280I$	$5.95099 - 9.03935I$	$1.43078 + 4.42094I$
$u = -0.910971 + 0.834834I$ $a = -1.39520 - 0.83245I$ $b = -0.16453 + 2.92280I$	$5.95099 + 9.03935I$	$1.43078 - 4.42094I$
$u = -0.885584 - 0.866640I$ $a = 1.50974 - 1.18822I$ $b = 0.37841 + 3.18031I$	$9.19750 - 2.53947I$	$3.93592 + 2.26065I$
$u = -0.885584 + 0.866640I$ $a = 1.50974 + 1.18822I$ $b = 0.37841 - 3.18031I$	$9.19750 + 2.53947I$	$3.93592 - 2.26065I$
$u = -0.845331 - 0.960143I$ $a = 2.46844 - 0.68770I$ $b = -0.88375 + 3.17281I$	$8.90043 + 8.94791I$	$3.25999 - 7.24575I$
$u = -0.845331 + 0.960143I$ $a = 2.46844 + 0.68770I$ $b = -0.88375 - 3.17281I$	$8.90043 - 8.94791I$	$3.25999 + 7.24575I$
$u = -0.843359 - 0.871287I$ $a = -1.58053 - 0.99032I$ $b = 2.04212 - 0.61200I$	$3.51042 - 0.65934I$	$-1.64525 + 3.03608I$
$u = -0.843359 + 0.871287I$ $a = -1.58053 + 0.99032I$ $b = 2.04212 + 0.61200I$	$3.51042 + 0.65934I$	$-1.64525 - 3.03608I$
$u = -0.839643 - 0.992004I$ $a = -2.25810 + 0.80518I$ $b = 0.57202 - 3.02731I$	$5.4499 + 15.5032I$	$0.56907 - 9.02044I$
$u = -0.839643 + 0.992004I$ $a = -2.25810 - 0.80518I$ $b = 0.57202 + 3.02731I$	$5.4499 - 15.5032I$	$0.56907 + 9.02044I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.823065 - 0.934173I$ $a = 0.54799 + 1.61489I$ $b = -1.96451 - 1.14977I$	$3.31523 + 6.86856I$	$-2.26425 - 8.06853I$
$u = -0.823065 + 0.934173I$ $a = 0.54799 - 1.61489I$ $b = -1.96451 + 1.14977I$	$3.31523 - 6.86856I$	$-2.26425 + 8.06853I$
$u = -0.817614 - 0.900250I$ $a = -2.55651 + 1.15874I$ $b = 0.38714 - 3.85396I$	$1.70109 + 3.05742I$	$-4.60638 - 2.59890I$
$u = -0.817614 + 0.900250I$ $a = -2.55651 - 1.15874I$ $b = 0.38714 + 3.85396I$	$1.70109 - 3.05742I$	$-4.60638 + 2.59890I$
$u = -0.769063 - 0.455452I$ $a = -0.930791 - 0.294716I$ $b = 0.667321 - 0.337766I$	$0.20150 + 3.82733I$	$2.45119 - 7.09206I$
$u = -0.769063 + 0.455452I$ $a = -0.930791 + 0.294716I$ $b = 0.667321 + 0.337766I$	$0.20150 - 3.82733I$	$2.45119 + 7.09206I$
$u = -0.587529 - 0.195087I$ $a = 0.575520 + 0.301118I$ $b = -0.685426 + 0.097381I$	$1.59378 + 0.29446I$	$6.92249 + 0.09350I$
$u = -0.587529 + 0.195087I$ $a = 0.575520 - 0.301118I$ $b = -0.685426 - 0.097381I$	$1.59378 - 0.29446I$	$6.92249 - 0.09350I$
$u = -0.568190 - 1.020443I$ $a = 0.267371 + 0.661740I$ $b = -0.379130 - 0.546655I$	$-1.55389 + 1.10217I$	$-0.55808 + 5.36603I$
$u = -0.568190 + 1.020443I$ $a = 0.267371 - 0.661740I$ $b = -0.379130 + 0.546655I$	$-1.55389 - 1.10217I$	$-0.55808 - 5.36603I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.440330 - 0.759700I$ $a = -1.066631 + 0.436456I$ $b = 0.384922 - 0.669695I$	$0.01176 + 1.74270I$	$0.45658 - 3.63727I$
$u = -0.440330 + 0.759700I$ $a = -1.066631 - 0.436456I$ $b = 0.384922 + 0.669695I$	$0.01176 - 1.74270I$	$0.45658 + 3.63727I$
$u = -0.340458 - 0.770916I$ $a = 2.47350 + 3.28718I$ $b = -3.16149 - 0.03944I$	$-1.98107 + 1.64703I$	$6.1662 + 29.1207I$
$u = -0.340458 + 0.770916I$ $a = 2.47350 - 3.28718I$ $b = -3.16149 + 0.03944I$	$-1.98107 - 1.64703I$	$6.1662 - 29.1207I$
$u = -0.336157 - 1.024864I$ $a = -0.225338 - 0.792429I$ $b = 0.112078 + 0.426502I$	$-1.05261 + 3.13615I$	$2.50844 - 8.50381I$
$u = -0.336157 + 1.024864I$ $a = -0.225338 + 0.792429I$ $b = 0.112078 - 0.426502I$	$-1.05261 - 3.13615I$	$2.50844 + 8.50381I$
$u = -0.310122 - 0.582175I$ $a = -1.49433 - 2.38673I$ $b = 1.265493 - 0.474592I$	$-1.39991 + 1.11754I$	$-8.74885 - 3.65436I$
$u = -0.310122 + 0.582175I$ $a = -1.49433 + 2.38673I$ $b = 1.265493 + 0.474592I$	$-1.39991 - 1.11754I$	$-8.74885 + 3.65436I$
$u = -0.010811 - 0.780206I$ $a = -1.13083 - 1.06637I$ $b = 0.336641 - 0.147588I$	$-1.43717 + 1.52858I$	$-5.32481 - 4.46151I$
$u = -0.010811 + 0.780206I$ $a = -1.13083 + 1.06637I$ $b = 0.336641 + 0.147588I$	$-1.43717 - 1.52858I$	$-5.32481 + 4.46151I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.051144 - 1.040465I$		
$a = 0.694306 + 0.600130I$	$-5.22394 + 4.97791I$	$-7.03726 - 5.31540I$
$b = 0.0941538 + 0.0407924I$		
$u = 0.051144 + 1.040465I$		
$a = 0.694306 - 0.600130I$	$-5.22394 - 4.97791I$	$-7.03726 + 5.31540I$
$b = 0.0941538 - 0.0407924I$		
$u = 0.225458 - 0.825902I$		
$a = -1.06368 - 2.01364I$	$-4.22808 - 0.48675I$	$-11.22027 + 2.03951I$
$b = 1.09293 + 1.05099I$		
$u = 0.225458 + 0.825902I$		
$a = -1.06368 + 2.01364I$	$-4.22808 + 0.48675I$	$-11.22027 - 2.03951I$
$b = 1.09293 - 1.05099I$		
$u = 0.332519 - 0.864557I$		
$a = 1.019626 - 0.147782I$	$-3.63287 - 3.82995I$	$-8.64205 + 8.99135I$
$b = 0.137567 + 0.696892I$		
$u = 0.332519 + 0.864557I$		
$a = 1.019626 + 0.147782I$	$-3.63287 + 3.82995I$	$-8.64205 - 8.99135I$
$b = 0.137567 - 0.696892I$		
$u = 0.341034 - 0.197878I$		
$a = -2.63966 - 0.02210I$	$-1.92464 + 1.08312I$	$-1.72371 - 1.84781I$
$b = 0.304941 - 0.449084I$		
$u = 0.341034 + 0.197878I$		
$a = -2.63966 + 0.02210I$	$-1.92464 - 1.08312I$	$-1.72371 + 1.84781I$
$b = 0.304941 + 0.449084I$		
$u = 0.434758 - 1.011699I$		
$a = -1.05107 - 1.46627I$	$-2.95190 - 11.16427I$	$-3.60588 + 9.61832I$
$b = 0.635292 + 1.236512I$		
$u = 0.434758 + 1.011699I$		
$a = -1.05107 + 1.46627I$	$-2.95190 + 11.16427I$	$-3.60588 - 9.61832I$
$b = 0.635292 - 1.236512I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.440912 - 0.897881I$	$0.81208 - 5.75126I$	$-0.14596 + 9.28589I$
$a = 1.28479 + 1.51068I$		
$b = -0.655511 - 0.976043I$		
$u = 0.440912 + 0.897881I$	$0.81208 + 5.75126I$	$-0.14596 - 9.28589I$
$a = 1.28479 - 1.51068I$		
$b = -0.655511 + 0.976043I$		
$u = 0.590155 - 0.416456I$	$2.32246 + 1.88820I$	$5.25997 - 2.06026I$
$a = 0.964716 + 0.975316I$		
$b = -0.411626 - 0.943907I$		
$u = 0.590155 + 0.416456I$	$2.32246 - 1.88820I$	$5.25997 + 2.06026I$
$a = 0.964716 - 0.975316I$		
$b = -0.411626 + 0.943907I$		
$u = 0.741876 - 0.285613I$	$-0.59272 + 6.92978I$	$1.28521 - 5.28654I$
$a = -1.143887 - 0.651964I$		
$b = 0.222922 + 0.926797I$		
$u = 0.741876 + 0.285613I$	$-0.59272 - 6.92978I$	$1.28521 + 5.28654I$
$a = -1.143887 + 0.651964I$		
$b = 0.222922 - 0.926797I$		
$u = 0.823019 - 0.992908I$	$6.63609 - 7.79931I$	$2.27644 + 7.29353I$
$a = 1.17187 + 0.87639I$		
$b = 0.13038 - 1.73093I$		
$u = 0.823019 + 0.992908I$	$6.63609 + 7.79931I$	$2.27644 - 7.29353I$
$a = 1.17187 - 0.87639I$		
$b = 0.13038 + 1.73093I$		
$u = 0.838722 - 0.920465I$	$4.97538 - 3.90988I$	$4.24532 - 6.23565I$
$a = 0.561004 - 0.957597I$		
$b = -1.93336 - 1.29288I$		
$u = 0.838722 + 0.920465I$	$4.97538 + 3.90988I$	$4.24532 + 6.23565I$
$a = 0.561004 + 0.957597I$		
$b = -1.93336 + 1.29288I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.848099 - 0.894531I$ $a = 1.07319 + 1.36400I$ $b = 1.65226 - 1.13672I$	$5.05665 - 2.36415I$	$3.35828 + 10.69478I$
$u = 0.848099 + 0.894531I$ $a = 1.07319 - 1.36400I$ $b = 1.65226 + 1.13672I$	$5.05665 + 2.36415I$	$3.35828 - 10.69478I$
$u = 0.867514 - 0.951168I$ $a = -1.31254 - 0.69248I$ $b = -0.09282 + 2.05203I$	$8.26855 - 3.73272I$	$4.21505 + 0.37316I$
$u = 0.867514 + 0.951168I$ $a = -1.31254 + 0.69248I$ $b = -0.09282 - 2.05203I$	$8.26855 + 3.73272I$	$4.21505 - 0.37316I$
$u = 0.895121 - 0.818579I$ $a = 0.892761 + 0.255381I$ $b = -0.50150 - 1.65644I$	$7.18623 + 1.43763I$	$3.61939 - 2.17602I$
$u = 0.895121 + 0.818579I$ $a = 0.892761 - 0.255381I$ $b = -0.50150 + 1.65644I$	$7.18623 - 1.43763I$	$3.61939 + 2.17602I$
$u = 0.897894 - 0.891847I$ $a = -1.155737 - 0.290111I$ $b = 0.41707 + 1.99877I$	$8.46147 - 2.78521I$	$4.56237 + 4.61833I$
$u = 0.897894 + 0.891847I$ $a = -1.155737 + 0.290111I$ $b = 0.41707 - 1.99877I$	$8.46147 + 2.78521I$	$4.56237 - 4.61833I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2 + u + 1)(u^{58} + 2u^{57} + \dots - u + 1)$
c_2, c_6	$(u^2 + u + 1)(u^{58} + 14u^{57} + \dots + 5u + 1)$
c_3	$(u^2 + u + 1)(u^{58} + 4u^{57} + \dots + u + 1)$
c_4	$(u^2 - u + 1)(u^{58} + 14u^{57} + \dots + 5u + 1)$
c_5	$(u^2 - u + 1)(u^{58} + 2u^{57} + \dots - u + 1)$
c_7	$(u - 1)^2(u^{58} + 3u^{57} + \dots + 10u + 1)$
c_8	$(u^2 - u + 1)(u^{58} + 4u^{57} + \dots + 21u + 1)$
c_9	$(u^2 - u + 1)(u^{58} + 2u^{57} + \dots - 403u + 77)$
c_{10}	$(u + 1)^2(u^{58} + 3u^{57} + \dots + 10u + 1)$
c_{11}	$u^2(u^{58} + 9u^{57} + \dots + 12u + 4)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^2 + y + 1)(y^{58} + 14y^{57} + \dots + 5y + 1)$
c_2, c_4, c_6	$(y^2 + y + 1)(y^{58} + 62y^{57} + \dots + 53y + 1)$
c_3	$(y^2 + y + 1)(y^{58} + 10y^{57} + \dots + 5y + 1)$
c_7, c_{10}	$(y - 1)^2(y^{58} - 33y^{57} + \dots + 122y + 1)$
c_8	$(y^2 + y + 1)(y^{58} - 46y^{57} + \dots + 117y + 1)$
c_9	$(y^2 + y + 1)(y^{58} - 58y^{57} + \dots - 89259y + 5929)$
c_{11}	$y^2(y^{58} - 15y^{57} + \dots - 168y + 16)$