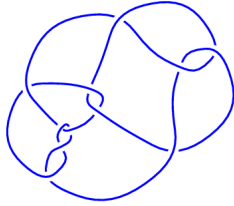
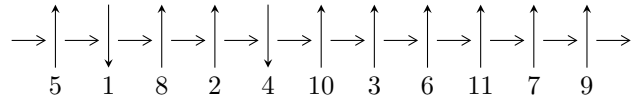


11a₄₈ (K11a₄₈)

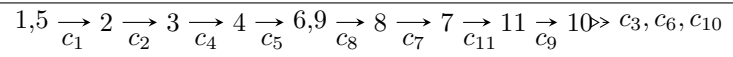


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle a^6 - a^5 - a^4 + 3a^2 - 2a + 1, -a^5 - a^4 - a^3 + 3a^2 + 5b - 2a - 2, 2a^5 - 3a^4 - 3a^3 - a^2 + 9a + 5u - 1 \rangle$$

$$I_2^u = \langle u^{62} - 4u^{61} + \dots + u + 1, -9u^{61} + 37u^{60} + \dots + 4a + 12, -14u^{61} + 23u^{60} + \dots + 4b - 7 \rangle$$

There are 2 irreducible components with 68 representations.

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

$$\mathbf{I. } I_1^u = \langle a^6 - a^5 - a^4 + 3a^2 - 2a + 1, -a^5 - a^4 - a^3 + 3a^2 + 5b - 2a - 2, 2a^5 - 3a^4 - 3a^3 - a^2 + 9a + 5u - 1 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \dots - \frac{9}{5}a + \frac{1}{5} \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \dots - \frac{9}{5}a + \frac{6}{5} \end{pmatrix} \\ a_3 &= \begin{pmatrix} \frac{2}{5}a^5 - \frac{3}{5}a^4 + \dots + \frac{9}{5}a - \frac{1}{5} \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \dots - \frac{9}{5}a + \frac{6}{5} \end{pmatrix} \\ a_4 &= \begin{pmatrix} \frac{2}{5}a^5 - \frac{3}{5}a^4 + \dots + \frac{9}{5}a - \frac{1}{5} \\ -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \dots - \frac{9}{5}a + \frac{6}{5} \end{pmatrix} \\ a_6 &= \begin{pmatrix} -1 \\ 0 \end{pmatrix} \\ a_9 &= \begin{pmatrix} a \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix} \\ a_8 &= \begin{pmatrix} -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots + \frac{3}{5}a - \frac{2}{5} \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix} \\ a_7 &= \begin{pmatrix} -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots + \frac{3}{5}a - \frac{2}{5} \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix} \\ a_{11} &= \begin{pmatrix} \frac{2}{5}a^5 + \frac{2}{5}a^4 + \dots + \frac{4}{5}a + \frac{4}{5} \\ \frac{3}{5}a^5 + \frac{3}{5}a^4 + \dots + \frac{4}{5}a - \frac{1}{5} \end{pmatrix} \\ a_{10} &= \begin{pmatrix} a^5 - a^3 - a^2 + 2a \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix} \\ a_{10} &= \begin{pmatrix} a^5 - a^3 - a^2 + 2a \\ \frac{1}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{2}{5}a + \frac{2}{5} \end{pmatrix} \end{aligned}$$

(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
$u = -0.500000 + 0.866025I$ $a = -1.024478 - 0.839835I$ $b = 0.215080 - 1.307141I$	$-3.02413 - 4.85801I$	$4.03424 + 5.28153I$
$u = -0.500000 - 0.866025I$ $a = -1.024478 + 0.839835I$ $b = 0.215080 + 1.307141I$	$-3.02413 + 4.85801I$	$4.03424 - 5.28153I$
$u = -0.500000 + 0.866025I$ $a = 0.284920 - 0.493496I$ $b = 0.569840$	$1.11345 - 2.02988I$	$12.72167 + 1.07831I$
$u = -0.500000 - 0.866025I$ $a = 0.284920 + 0.493496I$ $b = 0.569840$	$1.11345 + 2.02988I$	$12.72167 - 1.07831I$
$u = -0.500000 - 0.866025I$ $a = 1.239557 - 0.467306I$ $b = 0.215080 - 1.307141I$	$-3.02413 - 0.79824I$	$2.74410 + 0.29766I$
$u = -0.500000 + 0.866025I$ $a = 1.239557 + 0.467306I$ $b = 0.215080 + 1.307141I$	$-3.02413 + 0.79824I$	$2.74410 - 0.29766I$

$$\text{II. } I_2^u = \langle u^{62} - 4u^{61} + \dots + u + 1, -9u^{61} + 37u^{60} + \dots + 4a + 12, -14u^{61} + 23u^{60} + \dots + 4b - 7 \rangle$$

(i) Arc colorings

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

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

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

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

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

$$a_6 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} \frac{9}{2}u^{61} - \frac{37}{4}u^{60} + \dots - \frac{3}{2}u - 3 \\ \frac{7}{2}u^{61} - \frac{23}{4}u^{60} + \dots + \frac{13}{2}u + \frac{7}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} \frac{11}{4}u^{61} - \frac{35}{2}u^{60} + \dots - \frac{49}{4}u - \frac{35}{4} \\ \frac{13}{2}u^{61} - \frac{47}{4}u^{60} + \dots + \frac{23}{2}u + \frac{11}{4} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{13}{4}u^{61} - \frac{23}{2}u^{60} + \dots - \frac{7}{4}u - \frac{13}{4} \\ \frac{3}{2}u^{61} - \frac{1}{4}u^{60} + \dots + \frac{13}{2}u + \frac{9}{4} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{1}{4}u^{60} + \frac{3}{4}u^{59} + \dots + \frac{5}{2}u + \frac{7}{4} \\ \frac{1}{4}u^{61} - u^{60} + \dots - \frac{5}{4}u - \frac{1}{4} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{11}{4}u^{61} + \frac{47}{4}u^{60} + \dots + \frac{7}{4}u + 1 \\ -\frac{3}{4}u^{61} - \frac{1}{4}u^{60} + \dots - \frac{17}{4}u - \frac{5}{2} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{11}{4}u^{61} + \frac{47}{4}u^{60} + \dots + \frac{7}{4}u + 1 \\ -\frac{3}{4}u^{61} - \frac{1}{4}u^{60} + \dots - \frac{17}{4}u - \frac{5}{2} \end{pmatrix}$$

(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
$u = -0.762893 - 0.779001I$ $a = 0.88438 - 1.40384I$ $b = -0.547272 + 1.284433I$	$0.86999 - 2.89738I$	$9.03331 + 2.19430I$
$u = -0.762893 + 0.779001I$ $a = 0.88438 + 1.40384I$ $b = -0.547272 - 1.284433I$	$0.86999 + 2.89738I$	$9.03331 - 2.19430I$
$u = -0.760261 - 0.159745I$ $a = 0.938749 + 0.389340I$ $b = -0.56323 - 1.31677I$	$1.40736 + 5.86221I$	$11.56645 - 5.83230I$
$u = -0.760261 + 0.159745I$ $a = 0.938749 - 0.389340I$ $b = -0.56323 + 1.31677I$	$1.40736 - 5.86221I$	$11.56645 + 5.83230I$
$u = -0.744263$ $a = 1.16786$ $b = -1.09986$	5.44766	16.7724
$u = -0.740943 - 0.874063I$ $a = 1.87255 - 0.82263I$ $b = -1.074739 - 0.047853I$	$4.66247 + 2.81474I$	$13.46114 - 3.06514I$
$u = -0.740943 + 0.874063I$ $a = 1.87255 + 0.82263I$ $b = -1.074739 + 0.047853I$	$4.66247 - 2.81474I$	$13.46114 + 3.06514I$
$u = -0.728645 - 0.950887I$ $a = 2.59637 + 0.18053I$ $b = -0.54347 - 1.35036I$	$0.34590 + 8.55449I$	$7.89989 - 7.37126I$
$u = -0.728645 + 0.950887I$ $a = 2.59637 - 0.18053I$ $b = -0.54347 + 1.35036I$	$0.34590 - 8.55449I$	$7.89989 + 7.37126I$
$u = -0.708480 - 0.748571I$ $a = -0.625956 + 0.954656I$ $b = -0.035473 - 0.874104I$	$-0.06793 + 2.21961I$	$7.00118 - 3.72035I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.708480 + 0.748571I$ $a = -0.625956 - 0.954656I$ $b = -0.035473 + 0.874104I$	$-0.06793 - 2.21961I$	$7.00118 + 3.72035I$
$u = -0.696514 - 0.949067I$ $a = -2.10523 - 0.43360I$ $b = 0.084369 + 0.956151I$	$-0.66167 + 3.18112I$	$5.68094 - 2.23281I$
$u = -0.696514 + 0.949067I$ $a = -2.10523 + 0.43360I$ $b = 0.084369 - 0.956151I$	$-0.66167 - 3.18112I$	$5.68094 + 2.23281I$
$u = -0.675568 - 0.188318I$ $a = -0.786334 - 0.175025I$ $b = 0.053146 + 0.874363I$	$0.358267 + 0.639742I$	$9.73626 - 0.89260I$
$u = -0.675568 + 0.188318I$ $a = -0.786334 + 0.175025I$ $b = 0.053146 - 0.874363I$	$0.358267 - 0.639742I$	$9.73626 + 0.89260I$
$u = -0.580047 - 0.850451I$ $a = -0.615466 + 0.047953I$ $b = -0.105015 - 0.107324I$	$0.46590 + 2.28716I$	$1.57514 - 4.44404I$
$u = -0.580047 + 0.850451I$ $a = -0.615466 - 0.047953I$ $b = -0.105015 + 0.107324I$	$0.46590 - 2.28716I$	$1.57514 + 4.44404I$
$u = -0.491392 - 1.033553I$ $a = 0.487519 - 1.001305I$ $b = -0.126717 - 1.022767I$	$-1.94981 + 3.50251I$	$6.74199 - 2.92158I$
$u = -0.491392 + 1.033553I$ $a = 0.487519 + 1.001305I$ $b = -0.126717 + 1.022767I$	$-1.94981 - 3.50251I$	$6.74199 + 2.92158I$
$u = -0.446047 - 1.065130I$ $a = -0.990242 + 0.647003I$ $b = -0.466356 + 1.245927I$	$-1.36538 - 1.65817I$	$8.11270 + 2.15137I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.446047 + 1.065130I$ $a = -0.990242 - 0.647003I$ $b = -0.466356 - 1.245927I$	$-1.36538 + 1.65817I$	$8.11270 - 2.15137I$
$u = -0.288556 - 1.063806I$ $a = -0.278572 - 0.779132I$ $b = -0.996600 - 0.151978I$	$1.97217 + 3.44390I$	$11.66791 - 5.38327I$
$u = -0.288556 + 1.063806I$ $a = -0.278572 + 0.779132I$ $b = -0.996600 + 0.151978I$	$1.97217 - 3.44390I$	$11.66791 + 5.38327I$
$u = -0.246452$ $a = -1.59617$ $b = -0.280872$	0.790964	12.7577
$u = -0.193615 - 1.121265I$ $a = 0.76073 - 1.80584I$ $b = -0.50338 - 1.40284I$	$-2.88060 + 8.87825I$	$4.84069 - 8.24774I$
$u = -0.193615 + 1.121265I$ $a = 0.76073 + 1.80584I$ $b = -0.50338 + 1.40284I$	$-2.88060 - 8.87825I$	$4.84069 + 8.24774I$
$u = -0.176329 - 0.912969I$ $a = -0.631715 - 0.212995I$ $b = 0.204630 - 0.113298I$	$-1.47231 + 1.88154I$	$1.17198 - 4.94319I$
$u = -0.176329 + 0.912969I$ $a = -0.631715 + 0.212995I$ $b = 0.204630 + 0.113298I$	$-1.47231 - 1.88154I$	$1.17198 + 4.94319I$
$u = -0.172015 - 1.093989I$ $a = -1.05796 + 1.37125I$ $b = 0.117190 + 1.069155I$	$-3.80732 + 3.28559I$	$2.70369 - 3.32270I$
$u = -0.172015 + 1.093989I$ $a = -1.05796 - 1.37125I$ $b = 0.117190 - 1.069155I$	$-3.80732 - 3.28559I$	$2.70369 + 3.32270I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.017068 - 0.625651I$		
$a = 0.059805 + 1.358872I$	$0.589690 - 0.350421I$	$8.57728 + 0.80469I$
$b = -0.665979 + 0.287190I$		
$u = -0.017068 + 0.625651I$		
$a = 0.059805 - 1.358872I$	$0.589690 + 0.350421I$	$8.57728 - 0.80469I$
$b = -0.665979 - 0.287190I$		
$u = 0.067320 - 0.925637I$		
$a = -1.65632 - 1.56093I$	$-5.17463 + 1.43170I$	$-0.06499 - 2.83805I$
$b = -0.021019 - 1.209611I$		
$u = 0.067320 + 0.925637I$		
$a = -1.65632 + 1.56093I$	$-5.17463 - 1.43170I$	$-0.06499 + 2.83805I$
$b = -0.021019 + 1.209611I$		
$u = 0.113095 - 0.896419I$		
$a = 1.43284 + 1.95950I$	$-4.68648 - 4.26236I$	$0.88079 + 2.61775I$
$b = -0.35266 + 1.38822I$		
$u = 0.113095 + 0.896419I$		
$a = 1.43284 - 1.95950I$	$-4.68648 + 4.26236I$	$0.88079 - 2.61775I$
$b = -0.35266 - 1.38822I$		
$u = 0.361194 - 0.064869I$		
$a = -0.06161 + 2.33790I$	$-2.33982 + 2.66219I$	$4.81398 - 3.49490I$
$b = -0.267132 - 1.196306I$		
$u = 0.361194 + 0.064869I$		
$a = -0.06161 - 2.33790I$	$-2.33982 - 2.66219I$	$4.81398 + 3.49490I$
$b = -0.267132 + 1.196306I$		
$u = 0.672440 - 0.859246I$		
$a = -1.094706 - 0.307283I$	$-1.87828 + 0.43024I$	$10.07820 + 0.99106I$
$b = -0.15697 - 1.45420I$		
$u = 0.672440 + 0.859246I$		
$a = -1.094706 + 0.307283I$	$-1.87828 - 0.43024I$	$10.07820 - 0.99106I$
$b = -0.15697 + 1.45420I$		

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.673310 - 0.886698I$ $a = 0.848443 + 0.513970I$ $b = -0.08966 + 1.42530I$	$-1.96729 - 5.63314I$	$9.29193 + 6.96146I$
$u = 0.673310 + 0.886698I$ $a = 0.848443 - 0.513970I$ $b = -0.08966 - 1.42530I$	$-1.96729 + 5.63314I$	$9.29193 - 6.96146I$
$u = 0.741510 - 1.026057I$ $a = -2.01086 - 0.29598I$ $b = 0.288482 - 1.092218I$	$2.12433 - 9.28782I$	$7.07358 + 5.37090I$
$u = 0.741510 + 1.026057I$ $a = -2.01086 + 0.29598I$ $b = 0.288482 + 1.092218I$	$2.12433 + 9.28782I$	$7.07358 - 5.37090I$
$u = 0.749728 - 1.037361I$ $a = 2.34145 + 0.53630I$ $b = -0.56778 + 1.49568I$	$3.3199 - 15.1181I$	$8.76765 + 9.83151I$
$u = 0.749728 + 1.037361I$ $a = 2.34145 - 0.53630I$ $b = -0.56778 - 1.49568I$	$3.3199 + 15.1181I$	$8.76765 - 9.83151I$
$u = 0.752971 - 0.970116I$ $a = -0.630063 - 0.503155I$ $b = 0.456679 + 0.367835I$	$4.25170 - 6.26267I$	$8.01998 + 5.64382I$
$u = 0.752971 + 0.970116I$ $a = -0.630063 + 0.503155I$ $b = 0.456679 - 0.367835I$	$4.25170 + 6.26267I$	$8.01998 - 5.64382I$
$u = 0.774379 - 1.004959I$ $a = 1.35473 + 1.13843I$ $b = -1.218836 + 0.287269I$	$8.80808 - 8.74834I$	$13.8563 + 6.5357I$
$u = 0.774379 + 1.004959I$ $a = 1.35473 - 1.13843I$ $b = -1.218836 - 0.287269I$	$8.80808 + 8.74834I$	$13.8563 - 6.5357I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.789356 - 0.948317I$ $a = 0.026334 + 1.083390I$ $b = -0.815193 - 1.043276I$	$6.52873 - 1.87763I$	$12.33236 + 0.44343I$
$u = 0.789356 + 0.948317I$ $a = 0.026334 - 1.083390I$ $b = -0.815193 + 1.043276I$	$6.52873 + 1.87763I$	$12.33236 - 0.44343I$
$u = 0.811900 - 0.775479I$ $a = -1.206085 + 0.072648I$ $b = 0.416947 - 0.445355I$	$4.85281 + 0.38708I$	$9.40949 - 0.37474I$
$u = 0.811900 + 0.775479I$ $a = -1.206085 - 0.072648I$ $b = 0.416947 + 0.445355I$	$4.85281 - 0.38708I$	$9.40949 + 0.37474I$
$u = 0.838512 - 0.820293I$ $a = 1.45343 - 0.32563I$ $b = -0.784520 + 1.117279I$	$6.92919 - 4.19000I$	$12.85535 + 4.81135I$
$u = 0.838512 + 0.820293I$ $a = 1.45343 + 0.32563I$ $b = -0.784520 - 1.117279I$	$6.92919 + 4.19000I$	$12.85535 - 4.81135I$
$u = 0.848922 - 0.694333I$ $a = -0.858355 - 0.429131I$ $b = 0.287596 + 1.039466I$	$3.14061 + 3.35098I$	$8.80351 - 0.61428I$
$u = 0.848922 + 0.694333I$ $a = -0.858355 + 0.429131I$ $b = 0.287596 - 1.039466I$	$3.14061 - 3.35098I$	$8.80351 + 0.61428I$
$u = 0.866327 - 0.751351I$ $a = 1.39239 + 0.33135I$ $b = -1.227951 - 0.228420I$	$9.59400 + 2.64881I$	$15.2877 - 1.4188I$
$u = 0.866327 + 0.751351I$ $a = 1.39239 - 0.33135I$ $b = -1.227951 + 0.228420I$	$9.59400 - 2.64881I$	$15.2877 + 1.4188I$
Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.872766 - 0.690242I$ $a = 0.873901 + 0.662198I$ $b = -0.58873 - 1.46893I$	$4.38951 + 9.08805I$	$10.55855 - 5.20810I$
$u = 0.872766 + 0.690242I$ $a = 0.873901 - 0.662198I$ $b = -0.58873 + 1.46893I$	$4.38951 - 9.08805I$	$10.55855 + 5.20810I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2 + u + 1)^3(u^{62} + 4u^{61} + \dots - u + 1)$
c_2, c_5	$(u^2 + u + 1)^3(u^{62} + 20u^{61} + \dots - 17u + 1)$
c_3, c_7	$u^6(u^{62} + u^{61} + \dots - 224u - 64)$
c_4	$(u^2 - u + 1)^3(u^{62} + 4u^{61} + \dots - u + 1)$
c_6	$(u^3 - u^2 + 1)^2(u^{62} + 3u^{61} + \dots - 2u - 1)$
c_8	$(u^3 - u^2 + 2u - 1)^2(u^{62} + 3u^{61} + \dots - 4452u - 1201)$
c_9	$(u^3 + u^2 + 2u + 1)^2(u^{62} + 21u^{61} + \dots + 16u + 1)$
c_{10}	$(u^3 + u^2 - 1)^2(u^{62} + 3u^{61} + \dots - 2u - 1)$
c_{11}	$(u^3 - u^2 + 2u - 1)^2(u^{62} + 21u^{61} + \dots + 16u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y^2 + y + 1)^3(y^{62} + 20y^{61} + \dots - 17y + 1)$
c_2, c_5	$(y^2 + y + 1)^3(y^{62} + 48y^{61} + \dots - 369y + 1)$
c_3, c_7	$y^6(y^{62} - 35y^{61} + \dots - 37888y + 4096)$
c_6, c_{10}	$(y^3 - y^2 + 2y - 1)^2(y^{62} - 21y^{61} + \dots - 16y + 1)$
c_8	$(y^3 + 3y^2 + 2y - 1)^2(y^{62} - 17y^{61} + \dots - 4.19571 \times 10^7y + 1442401)$
c_9, c_{11}	$(y^3 + 3y^2 + 2y - 1)^2(y^{62} + 43y^{61} + \dots - 16y + 1)$