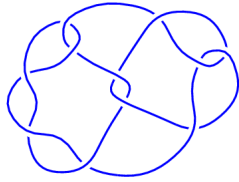
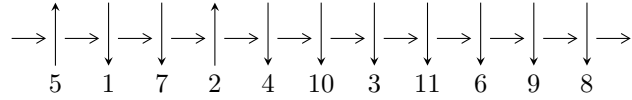


11a<sub>50</sub> (K11a<sub>50</sub>)

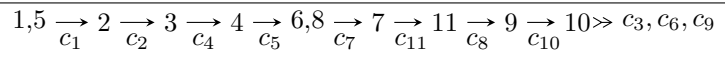


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

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

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

$$I_2^u = \langle u^{47} - 4u^{46} + \dots + 6u - 1, -2u^{46} + 9u^{45} + \dots + 4b + 5, -u^{46} + 18u^{45} + \dots + 4a - 25 \rangle$$

There are 2 irreducible components with 53 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>”

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

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0 \\ \frac{2}{5}a^5 - \frac{3}{5}a^4 + \dots + \frac{9}{5}a - \frac{6}{5} \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ \frac{2}{5}a^5 - \frac{3}{5}a^4 + \dots + \frac{9}{5}a - \frac{1}{5} \end{pmatrix} \\ a_3 &= \begin{pmatrix} -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \dots - \frac{9}{5}a + \frac{6}{5} \\ \frac{2}{5}a^5 - \frac{3}{5}a^4 + \dots + \frac{9}{5}a - \frac{1}{5} \end{pmatrix} \\ a_4 &= \begin{pmatrix} -\frac{2}{5}a^5 + \frac{3}{5}a^4 + \dots - \frac{9}{5}a + \frac{6}{5} \\ \frac{2}{5}a^5 - \frac{3}{5}a^4 + \dots + \frac{9}{5}a - \frac{1}{5} \end{pmatrix} \\ a_6 &= \begin{pmatrix} -1 \\ 0 \end{pmatrix} \\ a_8 &= \begin{pmatrix} a \\ -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots - \frac{2}{5}a - \frac{2}{5} \end{pmatrix} \\ a_7 &= \begin{pmatrix} a \\ -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots - \frac{2}{5}a - \frac{2}{5} \end{pmatrix} \\ a_{11} &= \begin{pmatrix} \frac{2}{5}a^5 + \frac{2}{5}a^4 + \dots + \frac{4}{5}a + \frac{4}{5} \\ -\frac{2}{5}a^5 - \frac{2}{5}a^4 + \dots - \frac{4}{5}a + \frac{1}{5} \end{pmatrix} \\ a_9 &= \begin{pmatrix} a^5 - a^3 - a^2 + 2a \\ -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots - \frac{2}{5}a - \frac{2}{5} \end{pmatrix} \\ a_{10} &= \begin{pmatrix} \frac{6}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{12}{5}a + \frac{2}{5} \\ -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots - \frac{2}{5}a - \frac{2}{5} \end{pmatrix} \\ a_{10} &= \begin{pmatrix} \frac{6}{5}a^5 + \frac{1}{5}a^4 + \dots + \frac{12}{5}a + \frac{2}{5} \\ -\frac{1}{5}a^5 - \frac{1}{5}a^4 + \dots - \frac{2}{5}a - \frac{2}{5} \end{pmatrix} \end{aligned}$$

(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
$u = -0.500000 - 0.866025I$ $a = -1.024478 - 0.839835I$ $b = -0.215080 + 1.307141I$	$3.02413 + 4.85801I$	$-2.74410 - 7.22587I$
$u = -0.500000 + 0.866025I$ $a = -1.024478 + 0.839835I$ $b = -0.215080 - 1.307141I$	$3.02413 - 4.85801I$	$-2.74410 + 7.22587I$
$u = -0.500000 - 0.866025I$ $a = 0.284920 - 0.493496I$ $b = -0.569840$	$-1.11345 + 2.02988I$	$-12.72167 - 5.84990I$
$u = -0.500000 + 0.866025I$ $a = 0.284920 + 0.493496I$ $b = -0.569840$	$-1.11345 - 2.02988I$	$-12.72167 + 5.84990I$
$u = -0.500000 + 0.866025I$ $a = 1.239557 - 0.467306I$ $b = -0.215080 + 1.307141I$	$3.02413 + 0.79824I$	$-4.03424 + 1.64667I$
$u = -0.500000 - 0.866025I$ $a = 1.239557 + 0.467306I$ $b = -0.215080 - 1.307141I$	$3.02413 - 0.79824I$	$-4.03424 - 1.64667I$

$$\langle u^{47} - 4u^{46} + \dots + 6u - 1, -2u^{46} + 9u^{45} + \dots + 4b + 5, -u^{46} + 18u^{45} + \dots + 4a - 25 \rangle$$

II.  $I_2^u =$

(i) Arc colorings

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

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

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

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

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

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

$$a_8 = \begin{pmatrix} \frac{1}{4}u^{46} - \frac{9}{2}u^{45} + \dots - 17u + \frac{25}{4} \\ \frac{1}{2}u^{46} - \frac{9}{4}u^{45} + \dots + \frac{9}{4}u - \frac{5}{4} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} \frac{7}{4}u^{46} - \frac{5}{2}u^{45} + \dots + 2u + \frac{7}{4} \\ -\frac{9}{2}u^{46} + \frac{41}{4}u^{45} + \dots + \frac{35}{4}u - \frac{7}{4} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -\frac{1}{4}u^{46} + \frac{3}{4}u^{45} + \dots + \frac{13}{4}u + 2 \\ \frac{1}{4}u^{46} - u^{45} + \dots - \frac{5}{2}u + \frac{1}{4} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -2u^{46} + \frac{15}{2}u^{45} + \dots + 20u + 1 \\ -\frac{5}{4}u^{46} + \frac{13}{4}u^{45} + \dots - \frac{11}{4}u + \frac{1}{2} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{7}{4}u^{46} + \frac{33}{4}u^{45} + \dots + \frac{107}{4}u - \frac{1}{2} \\ -\frac{5}{4}u^{46} + \frac{9}{4}u^{45} + \dots - \frac{31}{4}u + \frac{3}{2} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{7}{4}u^{46} + \frac{33}{4}u^{45} + \dots + \frac{107}{4}u - \frac{1}{2} \\ -\frac{5}{4}u^{46} + \frac{9}{4}u^{45} + \dots - \frac{31}{4}u + \frac{3}{2} \end{pmatrix}$$

(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
$u = -0.867038 - 0.019562I$		
$a = 0.12989 - 1.85582I$	$9.34836 + 3.22875I$	$0.48816 - 2.52460I$
$b = -0.08456 + 1.60423I$		
$u = -0.867038 + 0.019562I$		
$a = 0.12989 + 1.85582I$	$9.34836 - 3.22875I$	$0.48816 + 2.52460I$
$b = -0.08456 - 1.60423I$		
$u = -0.810352 - 0.881677I$		
$a = 1.20304 + 2.40238I$	$8.49103 - 0.19218I$	$-2.01859 - 0.12637I$
$b = -0.06174 - 1.58029I$		
$u = -0.810352 + 0.881677I$		
$a = 1.20304 - 2.40238I$	$8.49103 + 0.19218I$	$-2.01859 + 0.12637I$
$b = -0.06174 + 1.58029I$		
$u = -0.803055 - 0.903733I$		
$a = -0.99990 - 2.49478I$	$8.42204 + 6.23223I$	$-2.23245 - 5.02146I$
$b = -0.11755 + 1.60103I$		
$u = -0.803055 + 0.903733I$		
$a = -0.99990 + 2.49478I$	$8.42204 - 6.23223I$	$-2.23245 + 5.02146I$
$b = -0.11755 - 1.60103I$		
$u = -0.663428 - 0.780790I$		
$a = 1.00646 + 1.05901I$	$1.047096 + 0.807076I$	$-4.48198 + 0.15159I$
$b = -0.205400 - 0.577345I$		
$u = -0.663428 + 0.780790I$		
$a = 1.00646 - 1.05901I$	$1.047096 - 0.807076I$	$-4.48198 - 0.15159I$
$b = -0.205400 + 0.577345I$		
$u = -0.656947 - 0.912090I$		
$a = -0.22666 - 1.51107I$	$0.63898 + 4.31334I$	$-6.53825 - 6.48689I$
$b = -0.392245 + 0.675540I$		
$u = -0.656947 + 0.912090I$		
$a = -0.22666 + 1.51107I$	$0.63898 - 4.31334I$	$-6.53825 + 6.48689I$
$b = -0.392245 - 0.675540I$		

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.563257 - 0.159760I$ $a = 0.608331 - 0.292239I$ $b = -0.248810 + 0.689997I$	$1.45889 + 1.89863I$	$-0.82802 - 4.86862I$
$u = -0.563257 + 0.159760I$ $a = 0.608331 + 0.292239I$ $b = -0.248810 - 0.689997I$	$1.45889 - 1.89863I$	$-0.82802 + 4.86862I$
$u = -0.461388 - 0.956277I$ $a = 0.665200 - 0.526100I$ $b = -0.316069 - 0.253513I$	$-0.63663 + 1.64887I$	$-2.14725 + 2.29266I$
$u = -0.461388 + 0.956277I$ $a = 0.665200 + 0.526100I$ $b = -0.316069 + 0.253513I$	$-0.63663 - 1.64887I$	$-2.14725 - 2.29266I$
$u = -0.322894 - 1.152853I$ $a = 1.126819 - 0.062685I$ $b = -0.03457 - 1.51727I$	$5.51392 + 0.84918I$	$-3.71085 - 1.13770I$
$u = -0.322894 + 1.152853I$ $a = 1.126819 + 0.062685I$ $b = -0.03457 + 1.51727I$	$5.51392 - 0.84918I$	$-3.71085 + 1.13770I$
$u = -0.311898 - 0.787865I$ $a = 0.956078 - 0.122134I$ $b = 0.1036155 - 0.0693880I$	$-0.33163 + 1.48922I$	$-3.21291 - 4.41196I$
$u = -0.311898 + 0.787865I$ $a = 0.956078 + 0.122134I$ $b = 0.1036155 + 0.0693880I$	$-0.33163 - 1.48922I$	$-3.21291 + 4.41196I$
$u = -0.294048 - 1.158778I$ $a = -1.041503 + 0.000140I$ $b = -0.17743 + 1.57625I$	$5.33133 + 7.16658I$	$-4.32444 - 6.19083I$
$u = -0.294048 + 1.158778I$ $a = -1.041503 - 0.000140I$ $b = -0.17743 - 1.57625I$	$5.33133 - 7.16658I$	$-4.32444 + 6.19083I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.199822 - 1.009777I$ $a = -0.834043 + 0.291155I$ $b = -0.625995 + 0.626906I$	$-2.01497 + 4.25844I$	$-10.22284 - 8.38293I$
$u = -0.199822 + 1.009777I$ $a = -0.834043 - 0.291155I$ $b = -0.625995 - 0.626906I$	$-2.01497 - 4.25844I$	$-10.22284 + 8.38293I$
$u = -0.026264 - 0.834708I$ $a = -1.139078 + 0.577019I$ $b = -0.739974 - 0.342805I$	$-2.87835 - 0.31776I$	$-14.00580 + 0.89851I$
$u = -0.026264 + 0.834708I$ $a = -1.139078 - 0.577019I$ $b = -0.739974 + 0.342805I$	$-2.87835 + 0.31776I$	$-14.00580 - 0.89851I$
$u = 0.143780$ $a = 3.43014$ $b = -0.444877$	$-0.906933$	$-11.3954$
$u = 0.236667 - 0.699953I$ $a = -2.00141 + 0.89361I$ $b = -0.27531 - 1.39228I$	$2.56997 - 3.95764I$	$-7.31001 + 0.68586I$
$u = 0.236667 + 0.699953I$ $a = -2.00141 - 0.89361I$ $b = -0.27531 + 1.39228I$	$2.56997 + 3.95764I$	$-7.31001 - 0.68586I$
$u = 0.262896 - 0.609439I$ $a = 2.19053 - 0.65507I$ $b = -0.102273 + 1.283388I$	$2.83383 + 1.80935I$	$-5.60137 - 4.89150I$
$u = 0.262896 + 0.609439I$ $a = 2.19053 + 0.65507I$ $b = -0.102273 - 1.283388I$	$2.83383 - 1.80935I$	$-5.60137 + 4.89150I$
$u = 0.749711 - 0.881463I$ $a = 0.133762 + 0.692661I$ $b = -1.094818 + 0.057901I$	$1.38780 - 2.84463I$	$-6.42020 + 2.87095I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.749711 + 0.881463I$ $a = 0.133762 - 0.692661I$ $b = -1.094818 - 0.057901I$	$1.38780 + 2.84463I$	$-6.42020 - 2.87095I$
$u = 0.760355 - 0.975109I$ $a = -0.78027 + 1.38920I$ $b = -0.832040 - 0.941509I$	$3.97968 - 9.12021I$	$-4.70207 + 8.49829I$
$u = 0.760355 + 0.975109I$ $a = -0.78027 - 1.38920I$ $b = -0.832040 + 0.941509I$	$3.97968 + 9.12021I$	$-4.70207 - 8.49829I$
$u = 0.796590 - 1.043644I$ $a = -1.65368 + 1.73183I$ $b = -0.26885 - 1.69481I$	$12.7501 - 13.4737I$	$-1.97906 + 7.86996I$
$u = 0.796590 + 1.043644I$ $a = -1.65368 - 1.73183I$ $b = -0.26885 + 1.69481I$	$12.7501 + 13.4737I$	$-1.97906 - 7.86996I$
$u = 0.797400 - 0.942409I$ $a = 0.817901 - 0.783072I$ $b = 0.484733 + 0.494859I$	$6.27252 - 4.67969I$	$-0.19550 + 3.17611I$
$u = 0.797400 + 0.942409I$ $a = 0.817901 + 0.783072I$ $b = 0.484733 - 0.494859I$	$6.27252 + 4.67969I$	$-0.19550 - 3.17611I$
$u = 0.807992 - 1.034532I$ $a = 1.69856 - 1.55368I$ $b = 0.14248 + 1.55761I$	$13.2416 - 6.9328I$	$-1.14544 + 3.17565I$
$u = 0.807992 + 1.034532I$ $a = 1.69856 + 1.55368I$ $b = 0.14248 - 1.55761I$	$13.2416 + 6.9328I$	$-1.14544 - 3.17565I$
$u = 0.810606 - 0.776375I$ $a = 0.565835 - 0.632629I$ $b = -0.750225 + 1.009345I$	$4.58669 + 3.21526I$	$-3.05328 - 3.33895I$



Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.810606 + 0.776375I$ $a = 0.565835 + 0.632629I$ $b = -0.750225 - 1.009345I$	$4.58669 - 3.21526I$	$-3.05328 + 3.33895I$
$u = 0.830386 - 0.839820I$ $a = 0.137676 + 0.366174I$ $b = 0.439191 - 0.593639I$	$6.59048 - 1.40114I$	$0.38925 + 2.24691I$
$u = 0.830386 + 0.839820I$ $a = 0.137676 - 0.366174I$ $b = 0.439191 + 0.593639I$	$6.59048 + 1.40114I$	$0.38925 - 2.24691I$
$u = 0.927893 - 0.738669I$ $a = 0.28332 - 1.95602I$ $b = -0.22878 + 1.70233I$	$13.7092 + 7.1190I$	$-0.57186 - 3.20529I$
$u = 0.927893 + 0.738669I$ $a = 0.28332 + 1.95602I$ $b = -0.22878 - 1.70233I$	$13.7092 - 7.1190I$	$-0.57186 + 3.20529I$
$u = 0.928006 - 0.759035I$ $a = -0.06191 + 1.86044I$ $b = 0.10905 - 1.59219I$	$14.10936 + 0.53726I$	$0.02243 + 1.50138I$
$u = 0.928006 + 0.759035I$ $a = -0.06191 - 1.86044I$ $b = 0.10905 + 1.59219I$	$14.10936 - 0.53726I$	$0.02243 - 1.50138I$

### III. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u^2 + u + 1)^3(u^{47} + 4u^{46} + \dots + 6u + 1)$
$c_2, c_5$	$(u^2 + u + 1)^3(u^{47} + 14u^{46} + \dots + 38u - 1)$
$c_3, c_7$	$u^6(u^{47} + u^{46} + \dots + 96u - 64)$
$c_4$	$(u^2 - u + 1)^3(u^{47} + 4u^{46} + \dots + 6u + 1)$
$c_6$	$(u^3 + u^2 - 1)^2(u^{47} + 3u^{46} + \dots - u + 1)$
$c_8$	$(u^3 - u^2 + 2u - 1)^2(u^{47} + 11u^{46} + \dots + u + 1)$
$c_9$	$(u^3 - u^2 + 1)^2(u^{47} + 3u^{46} + \dots - u + 1)$
$c_{10}, c_{11}$	$(u^3 + u^2 + 2u + 1)^2(u^{47} + 11u^{46} + \dots + u + 1)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_4$	$(y^2 + y + 1)^3(y^{47} + 14y^{46} + \dots + 38y - 1)$
$c_2, c_5$	$(y^2 + y + 1)^3(y^{47} + 42y^{46} + \dots + 2346y - 1)$
$c_3, c_7$	$y^6(y^{47} + 35y^{46} + \dots - 23552y - 4096)$
$c_6, c_9$	$(y^3 - y^2 + 2y - 1)^2(y^{47} - 11y^{46} + \dots + y - 1)$
$c_8, c_{10}, c_{11}$	$(y^3 + 3y^2 + 2y - 1)^2(y^{47} + 53y^{46} + \dots + 41y - 1)$