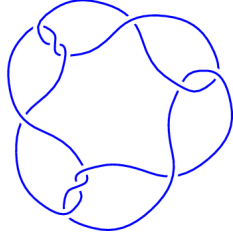
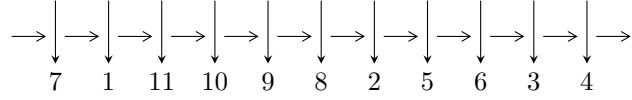


11a₂₄₅ (K11a₂₄₅)

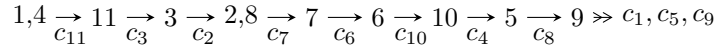


1

Arc Sequences



Solving Sequence



Representation Ideals

$$I = \bigcap_{i=1}^3 I_i^u$$

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

$$I_2^u = \langle u^{14} + u^{13} - 6u^{12} - 5u^{11} + 14u^{10} + 8u^9 - 13u^8 - 2u^6 - 11u^5 + 11u^4 + 5u^3 - 4u^2 + 4u - 1, \\ u^6 - 3u^4 + 2u^2 + a + 1, -u^{13} - u^{12} + 5u^{11} + 4u^{10} - 9u^9 - 5u^8 + 4u^7 + 6u^5 + 3u^4 - 5u^3 + b - u \rangle$$

$$I_3^u = \langle u^{24} + u^{23} + \dots + 4u^2 + 1, \\ u^{17} - 5u^{15} + 2u^{14} + 9u^{13} - 8u^{12} - 2u^{11} + 10u^{10} - 13u^9 + 3u^8 + 12u^7 - 14u^6 + 4u^5 + 4u^4 - 6u^3 + 4u^2 + b - \\ - 2u^{23} + 16u^{21} + \dots + a - 1 \rangle$$

There are 3 irreducible components with 39 representations.

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

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

(i) Arc colorings

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

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

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

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

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

$$a_8 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

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

(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
$u = 1.00000$		
$a = -1.00000$	-3.28987	-12.0000
$b = 0$		

II.

$$I_2^u = \langle u^{14} + u^{13} + \dots + 4u - 1, u^6 - 3u^4 + 2u^2 + a + 1, -u^{13} - u^{12} + \dots + b - u \rangle$$

(i) Arc colorings

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

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

$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^6 + 3u^4 - 2u^2 - 1 \\ u^{13} + u^{12} - 5u^{11} - 4u^{10} + 9u^9 + 5u^8 - 4u^7 - 6u^5 - 3u^4 + 5u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^9 - 4u^7 + 5u^5 - 3u \\ u^{12} - 5u^{10} + u^9 + 9u^8 - 4u^7 - 4u^6 + 5u^5 - 6u^4 + 5u^2 - 3u + 1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^3 - 2u \\ u^{12} + u^{11} + \dots - 3u + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^4 - u^2 - 1 \\ u^{13} + u^{12} + \dots - u^2 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^4 - u^2 - 1 \\ u^{13} + u^{12} + \dots - u^2 + u \end{pmatrix}$$

(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
$u = -1.38564$ $a = -0.858705$ $b = -0.310279$	-11.4128	-21.8333
$u = -1.364062 - 0.212940I$ $a = 0.098789 - 0.381539I$ $b = -0.441168 + 1.046602I$	$-8.69313 - 7.21786I$	$-18.5779 + 6.6599I$
$u = -1.364062 + 0.212940I$ $a = 0.098789 + 0.381539I$ $b = -0.441168 - 1.046602I$	$-8.69313 + 7.21786I$	$-18.5779 - 6.6599I$
$u = -1.329057 - 0.410124I$ $a = 1.51688 + 1.21546I$ $b = 2.07273 - 1.18475I$	$-0.11168 - 12.47308I$	$-13.5601 + 7.9056I$
$u = -1.329057 + 0.410124I$ $a = 1.51688 - 1.21546I$ $b = 2.07273 + 1.18475I$	$-0.11168 + 12.47308I$	$-13.5601 - 7.9056I$
$u = 0.029285 - 0.881113I$ $a = 2.80742 + 0.43631I$ $b = 2.16231 + 0.65198I$	$8.40861 + 3.17852I$	$-5.65702 - 2.68027I$
$u = 0.029285 + 0.881113I$ $a = 2.80742 - 0.43631I$ $b = 2.16231 - 0.65198I$	$8.40861 - 3.17852I$	$-5.65702 + 2.68027I$
$u = 0.150725 - 0.518889I$ $a = -0.401132 + 0.568901I$ $b = -0.785314 - 0.098189I$	$1.00801 + 1.75508I$	$-6.01712 - 6.20279I$
$u = 0.150725 + 0.518889I$ $a = -0.401132 - 0.568901I$ $b = -0.785314 + 0.098189I$	$1.00801 - 1.75508I$	$-6.01712 + 6.20279I$
$u = 0.290248$ $a = -1.14779$ $b = 0.378522$	-0.639037	-16.3132

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.276220 - 0.129179I$ $a = -0.417607 + 0.004977I$ $b = -0.93256 - 1.43125I$	$-5.86531 + 2.46178I$	$-16.4162 - 2.9434I$
$u = 1.276220 + 0.129179I$ $a = -0.417607 - 0.004977I$ $b = -0.93256 + 1.43125I$	$-5.86531 - 2.46178I$	$-16.4162 + 2.9434I$
$u = 1.284588 - 0.394747I$ $a = 0.89890 - 1.31380I$ $b = 2.38988 - 0.04383I$	$0.58736 + 5.97274I$	$-12.69846 - 3.76747I$
$u = 1.284588 + 0.394747I$ $a = 0.89890 + 1.31380I$ $b = 2.38988 + 0.04383I$	$0.58736 - 5.97274I$	$-12.69846 + 3.76747I$

III.

$$I_3^u = \langle u^{24} + u^{23} + \dots + 4u^2 + 1, u^{17} - 5u^{15} + \dots + b - u, -2u^{23} + 16u^{21} + \dots + a - 1 \rangle$$

(i) Arc colorings

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

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

$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 2u^{23} - 16u^{21} + \dots + 3u + 1 \\ -u^{17} + 5u^{15} + \dots - 4u^2 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 2u^{23} - 16u^{21} + \dots + 3u + 1 \\ -u^{14} + 4u^{12} + \dots - 3u^2 + u \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 2u^{23} - 16u^{21} + \dots + 4u + 1 \\ -u^{20} + 6u^{18} + \dots - 4u^2 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^5 + 2u^3 - u \\ u^7 - 3u^5 + 2u^3 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 2u^{23} - 16u^{21} + \dots - 6u^2 + 4u \\ u^{19} - 7u^{17} + \dots - 2u^2 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 2u^{23} - 16u^{21} + \dots - 6u^2 + 4u \\ u^{19} - 7u^{17} + \dots - 2u^2 + u \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.299303 - 0.409615I$ $a = -1.38427 - 1.50052I$ $b = -2.05463 + 0.90714I$	$4.26829 - 7.80134I$	$-9.63389 + 5.63981I$
$u = -1.299303 + 0.409615I$ $a = -1.38427 + 1.50052I$ $b = -2.05463 - 0.90714I$	$4.26829 + 7.80134I$	$-9.63389 - 5.63981I$
$u = -1.279918 - 0.182904I$ $a = -0.521420 + 0.858560I$ $b = 0.560507 - 0.529284I$	$-3.36661 - 4.24921I$	$-14.1765 + 6.9831I$
$u = -1.279918 + 0.182904I$ $a = -0.521420 - 0.858560I$ $b = 0.560507 + 0.529284I$	$-3.36661 + 4.24921I$	$-14.1765 - 6.9831I$
$u = -1.263085 - 0.396551I$ $a = 1.10421 + 1.77048I$ $b = 1.91195 - 0.61052I$	$0.75031 - 3.01307I$	$-12.63175 + 2.63251I$
$u = -1.263085 + 0.396551I$ $a = 1.10421 - 1.77048I$ $b = 1.91195 + 0.61052I$	$0.75031 + 3.01307I$	$-12.63175 - 2.63251I$
$u = -1.242514 - 0.071539I$ $a = 1.299102 - 0.509607I$ $b = -0.324180 + 0.160186I$	$-4.72717 - 0.35310I$	$-18.6669 + 0.6298I$
$u = -1.242514 + 0.071539I$ $a = 1.299102 + 0.509607I$ $b = -0.324180 - 0.160186I$	$-4.72717 + 0.35310I$	$-18.6669 - 0.6298I$
$u = -0.149210 - 0.343690I$ $a = 0.38022 - 2.32756I$ $b = 0.591528 - 0.544572I$	$-1.55013 - 0.71593I$	$-8.04353 + 0.64874I$
$u = -0.149210 + 0.343690I$ $a = 0.38022 + 2.32756I$ $b = 0.591528 + 0.544572I$	$-1.55013 + 0.71593I$	$-8.04353 - 0.64874I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.013292 - 0.856991I$ $a = -2.87070 + 0.01833I$ $b = -2.18517 - 0.35098I$	$4.62532 - 1.48234I$	$-8.84742 + 0.67542I$
$u = -0.013292 + 0.856991I$ $a = -2.87070 - 0.01833I$ $b = -2.18517 + 0.35098I$	$4.62532 + 1.48234I$	$-8.84742 - 0.67542I$
$u = 0.070751 - 0.894321I$ $a = -2.63267 - 0.81626I$ $b = -2.05463 - 0.90714I$	$4.26829 + 7.80134I$	$-9.63389 - 5.63981I$
$u = 0.070751 + 0.894321I$ $a = -2.63267 + 0.81626I$ $b = -2.05463 + 0.90714I$	$4.26829 - 7.80134I$	$-9.63389 + 5.63981I$
$u = 0.321894 - 0.643464I$ $a = 0.139355 + 0.381592I$ $b = 0.560507 + 0.529284I$	$-3.36661 + 4.24921I$	$-14.1765 - 6.9831I$
$u = 0.321894 + 0.643464I$ $a = 0.139355 - 0.381592I$ $b = 0.560507 - 0.529284I$	$-3.36661 - 4.24921I$	$-14.1765 + 6.9831I$
$u = 0.778878 - 0.387180I$ $a = 0.724270 + 0.366429I$ $b = -0.324180 + 0.160186I$	$-4.72717 - 0.35310I$	$-18.6669 + 0.6298I$
$u = 0.778878 + 0.387180I$ $a = 0.724270 - 0.366429I$ $b = -0.324180 - 0.160186I$	$-4.72717 + 0.35310I$	$-18.6669 - 0.6298I$
$u = 1.110594 - 0.134720I$ $a = 0.061147 - 0.280336I$ $b = 0.591528 + 0.544572I$	$-1.55013 + 0.71593I$	$-8.04353 - 0.64874I$
$u = 1.110594 + 0.134720I$ $a = 0.061147 + 0.280336I$ $b = 0.591528 - 0.544572I$	$-1.55013 - 0.71593I$	$-8.04353 + 0.64874I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.213272 - 0.447486I$ $a = 0.34948 - 1.57995I$ $b = 1.91195 - 0.61052I$	$0.75031 - 3.01307I$	$-12.63175 + 2.63251I$
$u = 1.213272 + 0.447486I$ $a = 0.34948 + 1.57995I$ $b = 1.91195 + 0.61052I$	$0.75031 + 3.01307I$	$-12.63175 - 2.63251I$
$u = 1.251933 - 0.421635I$ $a = -0.64872 + 1.47659I$ $b = -2.18517 + 0.35098I$	$4.62532 + 1.48234I$	$-8.84742 - 0.67542I$
$u = 1.251933 + 0.421635I$ $a = -0.64872 - 1.47659I$ $b = -2.18517 - 0.35098I$	$4.62532 - 1.48234I$	$-8.84742 + 0.67542I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_7	$\frac{u(u^{12} - u^{11} - u^{10} + 2u^9 + 3u^8 - 4u^7 - 2u^6 + 4u^5 + 2u^4 - 3u^3 - u^2 + 1)^2}{(u^{14} + 3u^{13} + \dots + 4u + 2)}$
c_2, c_4, c_6	$\frac{u(1 + 2u + 5u^2 + 17u^3 + 38u^4 + 56u^5 + 64u^6 + 56u^7 + 41u^8 + 22u^9 + 11u^{10} + 3u^{11} + u^{12})^2}{(u^{14} + 3u^{13} + \dots + 20u + 4)}$
c_3, c_5, c_8 c_9, c_{10}, c_{11}	$(u - 1)(u^{14} + u^{13} + \dots + 4u - 1)(u^{24} + u^{23} + \dots + 4u^2 + 1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_7	y $(1 - 2y + 5y^2 - 17y^3 + 38y^4 - 56y^5 + 64y^6 - 56y^7 + 41y^8 - 22y^9 + 11y^{10} - 3y^{11} + y^{12})^2$ $(y^{14} - 3y^{13} + \dots - 20y + 4)$
c_2, c_4, c_6	y $(1 + 6y + 33y^2 - 5y^3 + 38y^4 + 168y^5 + 292y^6 + 392y^7 + 365y^8 + 210y^9 + 71y^{10} + 13y^{11} + y^{12})^2$ $(y^{14} + 13y^{13} + \dots - 168y + 16)$
c_3, c_5, c_8 c_9, c_{10}, c_{11}	$(y - 1)(y^{14} - 13y^{13} + \dots - 8y + 1)(y^{24} - 17y^{23} + \dots + 8y + 1)$