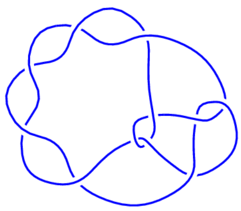
$11a_{214}$ $(K11a_{214})$



1

Arc Sequences

$$\to \underset{7}{\uparrow} \to \underset{1}{\downarrow} \to \underset{8}{\uparrow} \to \underset{11}{\downarrow} \to \underset{10}{\downarrow} \to \underset{2}{\uparrow} \to \underset{9}{\downarrow} \to \underset{3}{\uparrow} \to \underset{6}{\downarrow} \to \underset{5}{\downarrow} \to \underset{4}{\downarrow} \to$$

Solving Sequence

$$2{,}6 \xrightarrow[c_6]{} 7{,}9 \xrightarrow[c_9]{} 10 \xrightarrow[c_1]{} 1 \xrightarrow[c_2]{} 3 \xrightarrow[c_5]{} 5 \xrightarrow[c_{10}]{} 11 \xrightarrow[c_4]{} 4 \xrightarrow[c_8]{} 8 \gg c_3, c_7, c_{11}$$

Representation Ideals

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

$$\begin{aligned}
I_1^u &= \langle b^4 + 2b^3 + b^2 + 5,\ 2b^3 + 3b^2 - 4b + 9a + 2,\ 2b^3 + 3b^2 + 5b + 9u + 2\rangle \\
I_2^u &= \langle u^{16} + 3u^{14} - u^{13} + 8u^{12} - 2u^{11} + 11u^{10} - 4u^9 + 15u^8 - 2u^7 + 13u^6 - 2u^5 + 11u^4 + 5u^2 - u + 1, \\
&\quad u^{15} - u^{14} + 2u^{13} - 3u^{12} + 7u^{11} - 7u^{10} + 6u^9 - 8u^8 + 13u^7 - 9u^6 + 2u^5 - 6u^4 + 7u^3 - 5u^2 + 4a - 6u - 1, \\
&\quad u^{15} - u^{14} + 2u^{13} - 3u^{12} + 7u^{11} - 7u^{10} + 6u^9 - 8u^8 + 13u^7 - 9u^6 + 2u^5 - 6u^4 + 7u^3 - 5u^2 + 4b - 2u - 1\rangle \\
I_3^u &= \langle u^{22} + u^{21} + \cdots + 6u + 5,\ -160508u^{21} - 283168u^{20} + \cdots + 2148665a - 366973, \\
&\quad 211946u^{21} + 275871u^{20} + \cdots + 429733b + 1188174\rangle
\end{aligned}$$

There are 3 irreducible components with 42 representations.

[1]The knot diagram image is adapter from "C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, http://www.indiana.edu/ knotinfo"

I. $I^u_1 = \langle b^4 + 2b^3 + b^2 + 5,\ 2b^3 + 3b^2 - 4b + 9a + 2,\ 2b^3 + 3b^2 + 5b + 9u + 2\rangle$

(i) Arc colorings

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

$$a_6 = \begin{pmatrix}0\\-\frac{2}{9}b^3 - \frac{1}{3}b^2 - \frac{5}{9}b - \frac{2}{9}\end{pmatrix}$$

$$a_7 = \begin{pmatrix}-\frac{2}{9}b^3 - \frac{1}{3}b^2 - \frac{5}{9}b - \frac{2}{9}\\-\frac{2}{9}b^3 - \frac{1}{3}b^2 - \frac{5}{9}b - \frac{2}{9}\end{pmatrix}$$

$$a_9 = \begin{pmatrix}-\frac{2}{9}b^3 - \frac{1}{3}b^2 + \frac{4}{9}b - \frac{2}{9}\\b\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}-\frac{2}{9}b^3 - \frac{1}{3}b^2 + \frac{4}{9}b - \frac{2}{9}\\\frac{2}{9}b^3 + \frac{1}{3}b^2 + \frac{5}{9}b + \frac{2}{9}\end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix}-\frac{1}{3}b^3 - \frac{1}{3}b - \frac{1}{3}\\-\frac{4}{9}b^3 - \frac{2}{3}b^2 - \frac{1}{9}b - \frac{4}{9}\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}\frac{2}{9}b^3 + \frac{1}{3}b^2 - \frac{4}{9}b + \frac{11}{9}\\\frac{1}{9}b^3 + \frac{2}{3}b^2 - \frac{2}{9}b + \frac{1}{9}\end{pmatrix}$$

$$a_4 = \begin{pmatrix}\frac{1}{9}b^3 - \frac{1}{3}b^2 - \frac{2}{9}b + \frac{1}{9}\\\frac{1}{9}b^3 - \frac{1}{3}b^2 - \frac{2}{9}b + \frac{10}{9}\end{pmatrix}$$

$$a_8 = \begin{pmatrix}-\frac{4}{9}b^3 - \frac{2}{3}b^2 - \frac{1}{9}b - \frac{4}{9}\\-\frac{2}{9}b^3 - \frac{1}{3}b^2 + \frac{4}{9}b - \frac{2}{9}\end{pmatrix}$$

$$a_8 = \begin{pmatrix}-\frac{4}{9}b^3 - \frac{2}{3}b^2 - \frac{1}{9}b - \frac{4}{9}\\-\frac{2}{9}b^3 - \frac{1}{3}b^2 + \frac{4}{9}b - \frac{2}{9}\end{pmatrix}$$

(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
$u = 1.00000I$ $a = -1.61803$ $b = -1.61803 - 1.00000I$	5.59278	−4.00000
$u = -1.00000I$ $a = -1.61803$ $b = -1.61803 + 1.00000I$	5.59278	−4.00000
$u = 1.00000I$ $a = 0.618034$ $b = 0.618034 - 1.000000I$	−2.30291	−4.00000
$u = -1.00000I$ $a = 0.618034$ $b = 0.618034 + 1.000000I$	−2.30291	−4.00000

II.

$\boldsymbol{I_2^u = \langle u^{16} + 3u^{14} + \cdots - u + 1,\ u^{15} - u^{14} + \cdots + 4a - 1,\ u^{15} - u^{14} + \cdots + 4b - 1\rangle}$

(i) Arc colorings

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

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

$$a_7 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{3}{2}u + \frac{1}{4} \\ -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{1}{2}u + \frac{1}{4} \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{3}{2}u + \frac{1}{4} \\ u^5 + u^3 + u \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} \frac{1}{2}u^{15} - u^{14} + \cdots + \frac{5}{2}u - \frac{3}{2} \\ \frac{1}{4}u^{15} - \frac{1}{4}u^{14} + \cdots + \frac{3}{2}u - \frac{1}{4} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^{15} + \frac{5}{2}u^{13} + \cdots + u + \frac{3}{2} \\ \frac{3}{4}u^{15} - \frac{1}{4}u^{14} + \cdots + u + \frac{1}{4} \end{pmatrix}$$

$$a_4 = \begin{pmatrix} \frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{3}{4}u^2 - \frac{3}{4} \\ \frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{7}{4}u^2 + \frac{1}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{1}{2}u + \frac{1}{4} \\ -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{1}{2}u + \frac{1}{4} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{1}{2}u + \frac{1}{4} \\ -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots + \frac{1}{2}u + \frac{1}{4} \end{pmatrix}$$

(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
$u = -0.739034 - 0.627334I$ $a = -0.841258 - 0.815572I$ $b = -0.102224 - 0.188238I$	$5.48130 + 1.05317I$	$4.45688 - 2.38990I$
$u = -0.739034 + 0.627334I$ $a = -0.841258 + 0.815572I$ $b = -0.102224 + 0.188238I$	$5.48130 - 1.05317I$	$4.45688 + 2.38990I$
$u = -0.691623 - 1.176671I$ $a = 1.052037 + 0.704615I$ $b = 1.74366 + 1.88129I$	$12.2077 + 11.7947I$	$0.96071 - 6.63599I$
$u = -0.691623 + 1.176671I$ $a = 1.052037 - 0.704615I$ $b = 1.74366 - 1.88129I$	$12.2077 - 11.7947I$	$0.96071 + 6.63599I$
$u = -0.596655 - 1.032137I$ $a = -0.109726 + 0.540280I$ $b = 0.48693 + 1.57242I$	$-1.29053 + 6.45307I$	$-4.44807 - 7.45131I$
$u = -0.596655 + 1.032137I$ $a = -0.109726 - 0.540280I$ $b = 0.48693 - 1.57242I$	$-1.29053 - 6.45307I$	$-4.44807 + 7.45131I$
$u = -0.317155 - 0.789225I$ $a = -1.72238 - 0.65818I$ $b = -1.405228 + 0.131045I$	$6.59915 + 1.30998I$	$1.95561 - 5.45778I$
$u = -0.317155 + 0.789225I$ $a = -1.72238 + 0.65818I$ $b = -1.405228 - 0.131045I$	$6.59915 - 1.30998I$	$1.95561 + 5.45778I$
$u = 0.209770 - 0.436269I$ $a = 0.568820 - 0.850997I$ $b = 0.359050 - 0.414727I$	$0.004513 - 0.990902I$	$-0.07468 + 7.34190I$
$u = 0.209770 + 0.436269I$ $a = 0.568820 + 0.850997I$ $b = 0.359050 + 0.414727I$	$0.004513 + 0.990902I$	$-0.07468 - 7.34190I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.555046 - 0.909908I$ $a = 0.688090 + 0.110259I$ $b = 0.133044 + 1.020167I$	$-0.19881 - 2.75301I$	$-1.57245 + 2.26508I$
$u = 0.555046 + 0.909908I$ $a = 0.688090 - 0.110259I$ $b = 0.133044 - 1.020167I$	$-0.19881 + 2.75301I$	$-1.57245 - 2.26508I$
$u = 0.652805 - 1.114226I$ $a = -0.533500 + 0.650708I$ $b = -1.18631 + 1.76493I$	$2.50481 - 9.84228I$	$-0.10556 + 8.25112I$
$u = 0.652805 + 1.114226I$ $a = -0.533500 - 0.650708I$ $b = -1.18631 - 1.76493I$	$2.50481 + 9.84228I$	$-0.10556 - 8.25112I$
$u = 0.926846 - 0.626361I$ $a = 0.89792 - 1.27849I$ $b = -0.028925 - 0.652126I$	$15.8152 - 0.4292I$	$4.82755 + 2.00465I$
$u = 0.926846 + 0.626361I$ $a = 0.89792 + 1.27849I$ $b = -0.028925 + 0.652126I$	$15.8152 + 0.4292I$	$4.82755 - 2.00465I$

III.

$\boldsymbol{I_3^u = \langle u^{22} + u^{21} + \cdots + 6u + 5,\ -1.61 \times 10^5 u^{21} - 2.83 \times 10^5 u^{20} + \cdots + 2.15 \times 10^6 a - 3.67 \times 10^5,\ 2.12 \times 10^5 u^{21} + 2.76 \times 10^5 u^{20} + \cdots + 4.30 \times 10^5 b + 1.19 \times 10^6 \rangle}$

(i) Arc colorings

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

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

$$a_7 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 0.0747013u^{21} + 0.131788u^{20} + \cdots - 0.874577u + 0.170791 \\ -0.493204u^{21} - 0.641959u^{20} + \cdots - 6.08237u - 2.76491 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 0.0747013u^{21} + 0.131788u^{20} + \cdots - 0.874577u + 0.170791 \\ -0.782970u^{21} - 0.955766u^{20} + \cdots - 6.79840u - 3.05035 \end{pmatrix}$$

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

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

$$a_5 = \begin{pmatrix} 0.331109u^{21} + 0.413583u^{20} + \cdots + 2.78813u + 1.30908 \\ 0.214435u^{21} + 0.800367u^{20} + \cdots - 0.0196448u + 1.48856 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.205744u^{21} - 0.326088u^{20} + \cdots + 0.156570u - 1.22255 \\ 0.503457u^{21} - 0.242811u^{20} + \cdots + 0.879521u + 0.583367 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -0.380187u^{21} - 0.0215362u^{20} + \cdots - 0.0453789u - 1.15037 \\ 0.229882u^{21} - 0.194437u^{20} + \cdots - 1.92489u - 4.28836 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.0275418u^{21} + 0.323516u^{20} + \cdots - 0.657386u + 0.591853 \\ -0.782970u^{21} - 0.955766u^{20} + \cdots - 5.79840u - 3.05035 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.0275418u^{21} + 0.323516u^{20} + \cdots - 0.657386u + 0.591853 \\ -0.782970u^{21} - 0.955766u^{20} + \cdots - 5.79840u - 3.05035 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.986171 - 0.439556I$ $a = 0.71539 + 1.44238I$ $b = -0.370454 + 0.315681I$	$14.4695 - 5.6984I$	$3.54476 + 2.83577I$
$u = -0.986171 + 0.439556I$ $a = 0.71539 - 1.44238I$ $b = -0.370454 - 0.315681I$	$14.4695 + 5.6984I$	$3.54476 - 2.83577I$
$u = -0.662778 - 0.976432I$ $a = -0.613122 - 0.698594I$ $b = -0.90348 - 1.42464I$	$4.47712 + 4.26374I$	$2.95029 - 4.02329I$
$u = -0.662778 + 0.976432I$ $a = -0.613122 + 0.698594I$ $b = -0.90348 + 1.42464I$	$4.47712 - 4.26374I$	$2.95029 + 4.02329I$
$u = -0.610796 - 0.518790I$ $a = 0.732873 - 0.099949I$ $b = -0.299838 - 0.613611I$	$0.18031 - 1.62554I$	$-1.42199 + 3.91435I$
$u = -0.610796 + 0.518790I$ $a = 0.732873 + 0.099949I$ $b = -0.299838 + 0.613611I$	$0.18031 + 1.62554I$	$-1.42199 - 3.91435I$
$u = -0.579803 - 0.857238I$ $a = 1.34246 + 0.94342I$ $b = 0.10974 + 2.24371I$	$7.95553 + 2.30219I$	$0.32022 - 2.86330I$
$u = -0.579803 + 0.857238I$ $a = 1.34246 - 0.94342I$ $b = 0.10974 - 2.24371I$	$7.95553 - 2.30219I$	$0.32022 + 2.86330I$
$u = -0.197868 - 1.057098I$ $a = -0.057779 + 0.308683I$ $b = -0.624592 + 1.222647I$	-3.92670	-11.6982
$u = -0.197868 + 1.057098I$ $a = -0.057779 - 0.308683I$ $b = -0.624592 - 1.222647I$	-3.92670	-11.6982

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.111564-1.357145I$ $a=-1.244438-0.079920I$ $b=-1.99597+0.15207I$	$7.95553-2.30219I$	$0.32022+2.86330I$
$u=-0.111564+1.357145I$ $a=-1.244438+0.079920I$ $b=-1.99597-0.15207I$	$7.95553+2.30219I$	$0.32022-2.86330I$
$u=0.125296-1.244617I$ $a=0.715202+0.046512I$ $b=1.320485+0.472454I$	$-1.26759+1.65848I$	$-0.54419-4.72916I$
$u=0.125296+1.244617I$ $a=0.715202-0.046512I$ $b=1.320485-0.472454I$	$-1.26759-1.65848I$	$-0.54419+4.72916I$
$u=0.399913-0.875160I$ $a=-0.772209+0.521411I$ $b=0.18495+1.83613I$	$-1.26759-1.65848I$	$-0.54419+4.72916I$
$u=0.399913+0.875160I$ $a=-0.772209-0.521411I$ $b=0.18495-1.83613I$	$-1.26759+1.65848I$	$-0.54419-4.72916I$
$u=0.529162-0.802687I$ $a=-0.008791-0.616475I$ $b=0.482064-1.069543I$	$0.18031-1.62554I$	$-1.42199+3.91435I$
$u=0.529162+0.802687I$ $a=-0.008791+0.616475I$ $b=0.482064+1.069543I$	$0.18031+1.62554I$	$-1.42199-3.91435I$
$u=0.746289-1.064202I$ $a=1.062488-0.812263I$ $b=1.26433-1.68612I$	$14.4695-5.6984I$	$3.54476+2.83577I$
$u=0.746289+1.064202I$ $a=1.062488+0.812263I$ $b=1.26433+1.68612I$	$14.4695+5.6984I$	$3.54476-2.83577I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=0.848321-0.450725I$ $a=-0.772068+0.841303I$ $b=0.332764-0.097424I$	$4.47712+4.26374I$	$2.95029-4.02329I$
$u=0.848321+0.450725I$ $a=-0.772068-0.841303I$ $b=0.332764+0.097424I$	$4.47712-4.26374I$	$2.95029+4.02329I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_3, c_6 c_8	$(u^2+1)^2(u^{16}+3u^{14}+\cdots-u+1)(u^{22}+u^{21}+\cdots+6u+5)$
c_2	$(u+1)^4(u^{16}+6u^{15}+\cdots+9u+1)(u^{22}+11u^{21}+\cdots+124u+25)$
c_4, c_5, c_9 c_{10}, c_{11}	(u^4+3u^2+1) $(u^{11}-u^{10}+8u^9-7u^8+22u^7-16u^6+24u^5-13u^4+9u^3-3u^2+1)^2$ $(u^{16}+3u^{15}+\cdots+7u+2)$
c_7	$(u-1)^4(u^{16}+6u^{15}+\cdots+9u+1)(u^{22}+11u^{21}+\cdots+124u+25)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_6 c_8	$(y+1)^4(y^{16}+6y^{15}+\cdots+9y+1)(y^{22}+11y^{21}+\cdots+124y+25)$
c_2, c_7	$(y-1)^4(y^{16}+14y^{15}+\cdots+13y+1)(y^{22}-y^{21}+\cdots+4824y+625)$
c_4, c_5, c_9 c_{10}, c_{11}	$(y^2+3y+1)^2$ $(-1+6y+17y^2+35y^3+181y^4+516y^5+756y^6+636y^7+319y^8+94y^9+15y^{10}+y^{11})^2$ $(y^{16}+21y^{15}+\cdots+23y+4)$