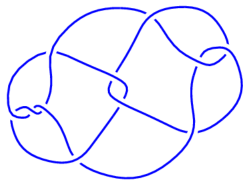
$11a_{63}$ ($K11a_{63}$)



[1]

Arc Sequences

$\to \uparrow_{5} \to \downarrow_{1} \to \uparrow_{9} \to \uparrow_{2} \to \downarrow_{4} \to \uparrow_{11} \to \uparrow_{10} \to \uparrow_{3} \to \uparrow_{6} \to \uparrow_{7} \to \uparrow_{8} \to$

5 1 9 2 4 11 10 3 6 7 8

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle a^6 - a^5 + a^4 - 2a^3 + a^2 + 1,\ -a^4 + a^3 - a^2 + a + u,\ -a^5 + a^4 - a^3 + a^2 + b\rangle$$
$$I_2^u = \langle u^{52} - 4u^{51} + \cdots + 2u + 1,\ u^{50} - u^{49} + \cdots + 4b - 7,\ -3u^{51} + 24u^{50} + \cdots + 4a + 13\rangle$$

There are 2 irreducible components with 58 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.

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

(i) Arc colorings

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

$$a_5 = \begin{pmatrix} 0 \\ a^4 - a^3 + a^2 - a \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 1 \\ a^4 - a^3 + a^2 - a + 1 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -a^4 + a^3 - a^2 + a \\ a^4 - a^3 + a^2 - a + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} a \\ a^5 - a^4 + a^3 - a^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} a \\ a^5 - a^4 + a^3 - a^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -a^4 + a^3 - a^2 + a \\ a^4 - a^3 + a^2 - a + 1 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} a^3 - a^2 \\ -a^3 + 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} a^4 - a^3 \\ a^5 - a^4 - a^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a^5 - a^4 + a^3 - a^2 + a \\ a^5 - a^4 + a^3 - a^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} a^5 - a^4 + a^3 - a^2 + a \\ a^5 - a^4 + a^3 - a^2 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.500000+0.866025I$ $a=-0.377439-0.653743I$ $b=0.754878$	$1.11345-2.02988I$	$12.18187+2.43783I$
$u=-0.500000-0.866025I$ $a=-0.377439+0.653743I$ $b=0.754878$	$1.11345+2.02988I$	$12.18187-2.43783I$
$u=-0.500000-0.866025I$ $a=-0.206350-1.132315I$ $b=-0.877439+0.744862I$	$-3.02413-0.79824I$	$2.88198-0.84592I$
$u=-0.500000+0.866025I$ $a=-0.206350+1.132315I$ $b=-0.877439-0.744862I$	$-3.02413+0.79824I$	$2.88198+0.84592I$
$u=-0.500000-0.866025I$ $a=1.083789-0.387453I$ $b=-0.877439-0.744862I$	$-3.02413+4.85801I$	$6.43615-6.24253I$
$u=-0.500000+0.866025I$ $a=1.083789+0.387453I$ $b=-0.877439+0.744862I$	$-3.02413-4.85801I$	$6.43615+6.24253I$

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle u^{52} - 4u^{51} + \cdots + 2u + 1,\ u^{50} - u^{49} + \cdots + 4b - 7,\ -3u^{51} + 24u^{50} + \cdots + 4a + 13\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^2 + 1 \\ -u^2 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} \frac{3}{4}u^{51} - 6u^{50} + \cdots - \frac{21}{2}u - \frac{13}{4} \\ -\frac{1}{4}u^{50} + \frac{1}{4}u^{49} + \cdots + \frac{23}{4}u + \frac{7}{4} \end{pmatrix}$$
$$a_9 = \begin{pmatrix} \frac{9}{4}u^{51} - 4u^{50} + \cdots + \frac{7}{2}u + \frac{5}{4} \\ -5u^{51} + \frac{49}{4}u^{50} + \cdots + \frac{13}{4}u + \frac{9}{4} \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -\frac{1}{4}u^{51} + \frac{3}{4}u^{50} + \cdots + \frac{11}{4}u + 2 \\ \frac{1}{4}u^{51} - u^{50} + \cdots - \frac{3}{2}u - \frac{1}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -\frac{7}{4}u^{51} + \frac{33}{4}u^{50} + \cdots + \frac{53}{4}u + \frac{7}{2} \\ -\frac{5}{4}u^{51} + \frac{9}{4}u^{50} + \cdots - \frac{21}{4}u - \frac{3}{2} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{9}{4}u^{51} - \frac{23}{4}u^{50} + \cdots + \frac{7}{4}u + \frac{1}{2} \\ -2u^{51} + \frac{17}{4}u^{50} + \cdots + \frac{13}{4}u + \frac{5}{4} \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} \frac{9}{4}u^{51} - \frac{23}{4}u^{50} + \cdots + \frac{7}{4}u + \frac{1}{2} \\ -2u^{51} + \frac{17}{4}u^{50} + \cdots + \frac{13}{4}u + \frac{5}{4} \end{pmatrix}$$

(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
$u = -0.812726 - 0.068929I$ $a = -1.48877 - 0.40529I$ $b = \quad 1.363327 + 0.251198I$	$2.38423 + 4.29256I$	$11.02057 - 3.52025I$
$u = -0.812726 + 0.068929I$ $a = -1.48877 + 0.40529I$ $b = \quad 1.363327 - 0.251198I$	$2.38423 - 4.29256I$	$11.02057 + 3.52025I$
$u = -0.811167$ $a = \quad 1.50905$ $b = -1.38438$	6.31990	15.1003
$u = -0.785939 - 0.842838I$ $a = \quad 1.99828 - 1.29160I$ $b = -1.294674 + 0.222751I$	$1.65758 - 1.30987I$	$8.40240 + 0.50235I$
$u = -0.785939 + 0.842838I$ $a = \quad 1.99828 + 1.29160I$ $b = -1.294674 - 0.222751I$	$1.65758 + 1.30987I$	$8.40240 - 0.50235I$
$u = -0.775736 - 0.883560I$ $a = -2.17999 + 0.97387I$ $b = \quad 1.355207 + 0.057513I$	$5.47556 + 2.92351I$	$12.21309 - 2.83301I$
$u = -0.775736 + 0.883560I$ $a = -2.17999 - 0.97387I$ $b = \quad 1.355207 - 0.057513I$	$5.47556 - 2.92351I$	$12.21309 + 2.83301I$
$u = -0.766871 - 0.919617I$ $a = \quad 2.32216 - 0.66793I$ $b = -1.38085 - 0.32488I$	$1.42090 + 7.15944I$	$7.81961 - 5.78038I$
$u = -0.766871 + 0.919617I$ $a = \quad 2.32216 + 0.66793I$ $b = -1.38085 + 0.32488I$	$1.42090 - 7.15944I$	$7.81961 + 5.78038I$
$u = -0.593730 - 0.544651I$ $a = -0.203670 + 1.354613I$ $b = -0.055667 - 0.506988I$	$-2.37385 + 1.42524I$	$6.98919 - 3.29671I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.593730 + 0.544651I$ $a = -0.203670 - 1.354613I$ $b = -0.055667 + 0.506988I$	$-2.37385 - 1.42524I$	$6.98919 + 3.29671I$
$u = -0.585382 - 0.986240I$ $a = -1.251046 - 0.499634I$ $b = 0.205112 + 0.735701I$	$-3.61886 + 3.25992I$	$3.57612 - 1.67401I$
$u = -0.585382 + 0.986240I$ $a = -1.251046 + 0.499634I$ $b = 0.205112 - 0.735701I$	$-3.61886 - 3.25992I$	$3.57612 + 1.67401I$
$u = -0.563623 - 0.854687I$ $a = 0.718334 - 0.309437I$ $b = -0.272497 - 0.110524I$	$0.38915 + 2.24131I$	$1.28116 - 4.34025I$
$u = -0.563623 + 0.854687I$ $a = 0.718334 + 0.309437I$ $b = -0.272497 + 0.110524I$	$0.38915 - 2.24131I$	$1.28116 + 4.34025I$
$u = -0.361647 - 1.101130I$ $a = 0.274376 + 1.112651I$ $b = 1.118293 - 0.230215I$	$-0.998594 - 0.270066I$	$7.16710 - 0.48954I$
$u = -0.361647 + 1.101130I$ $a = 0.274376 - 1.112651I$ $b = 1.118293 + 0.230215I$	$-0.998594 + 0.270066I$	$7.16710 + 0.48954I$
$u = -0.297910 - 1.114133I$ $a = -0.133146 - 1.000532I$ $b = -1.262574 - 0.160584I$	$2.59377 + 3.74328I$	$10.41806 - 4.50899I$
$u = -0.297910 + 1.114133I$ $a = -0.133146 + 1.000532I$ $b = -1.262574 + 0.160584I$	$2.59377 - 3.74328I$	$10.41806 + 4.50899I$
$u = -0.252816 - 1.133903I$ $a = 0.048654 + 0.894445I$ $b = 1.38535 + 0.46744I$	$-1.67983 + 7.82276I$	$5.27070 - 6.98657I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.252816 + 1.133903I$ $a = 0.048654 - 0.894445I$ $b = 1.38535 - 0.46744I$	$-1.67983 - 7.82276I$	$5.27070 + 6.98657I$
$u = -0.233962$ $a = 1.12523$ $b = 0.413250$	0.683535	14.8024
$u = -0.202279 - 0.838272I$ $a = 0.285414 + 1.003089I$ $b = 0.063302 + 0.372285I$	$-1.24517 + 1.68566I$	$2.41923 - 5.81718I$
$u = -0.202279 + 0.838272I$ $a = 0.285414 - 1.003089I$ $b = 0.063302 - 0.372285I$	$-1.24517 - 1.68566I$	$2.41923 + 5.81718I$
$u = -0.072071 - 0.982973I$ $a = -0.515866 - 0.784460I$ $b = -0.208353 - 1.088640I$	$-6.61640 + 2.33196I$	$-1.04407 - 3.62202I$
$u = -0.072071 + 0.982973I$ $a = -0.515866 + 0.784460I$ $b = -0.208353 + 1.088640I$	$-6.61640 - 2.33196I$	$-1.04407 + 3.62202I$
$u = 0.105730 - 0.654332I$ $a = -0.54331 - 1.73025I$ $b = 0.875003 - 0.257483I$	$0.592117 - 0.648848I$	$7.92572 + 0.14612I$
$u = 0.105730 + 0.654332I$ $a = -0.54331 + 1.73025I$ $b = 0.875003 + 0.257483I$	$0.592117 + 0.648848I$	$7.92572 - 0.14612I$
$u = 0.161857 - 0.785811I$ $a = 0.98188 + 1.57924I$ $b = -1.128834 + 0.739094I$	$-3.96051 - 3.97418I$	$1.13703 + 1.46534I$
$u = 0.161857 + 0.785811I$ $a = 0.98188 - 1.57924I$ $b = -1.128834 - 0.739094I$	$-3.96051 + 3.97418I$	$1.13703 - 1.46534I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=\ \ 0.265565-0.336428I$ $a=\ \ 0.11816+2.53234I$ $b=-0.702110-0.565800I$	$-2.79485+2.18309I$	$4.61508-4.09398I$
$u=\ \ 0.265565+0.336428I$ $a=\ \ 0.11816-2.53234I$ $b=-0.702110+0.565800I$	$-2.79485-2.18309I$	$4.61508+4.09398I$
$u=\ \ 0.716488-0.943614I$ $a=\ \ 1.50944+0.14874I$ $b=-0.65511+1.38335I$	$-1.95701-7.04982I$	$6.30208+6.77268I$
$u=\ \ 0.716488+0.943614I$ $a=\ \ 1.50944-0.14874I$ $b=-0.65511-1.38335I$	$-1.95701+7.04982I$	$6.30208-6.77268I$
$u=\ \ 0.730218-0.796225I$ $a=-0.134472+0.994673I$ $b=-0.80666-1.27912I$	$-1.50041+1.51719I$	$8.09236-0.97316I$
$u=\ \ 0.730218+0.796225I$ $a=-0.134472-0.994673I$ $b=-0.80666+1.27912I$	$-1.50041-1.51719I$	$8.09236+0.97316I$
$u=\ \ 0.770440-0.913580I$ $a=-0.778021-0.327773I$ $b=\ \ 0.242719-0.835613I$	$4.30098-4.90907I$	$10.88602+6.29040I$
$u=\ \ 0.770440+0.913580I$ $a=-0.778021+0.327773I$ $b=\ \ 0.242719+0.835613I$	$4.30098+4.90907I$	$10.88602-6.29040I$
$u=\ \ 0.776050-1.038155I$ $a=-1.82906-1.41408I$ $b=\ \ 1.66085-0.53392I$	$5.1887-14.0116I$	$8.27342+8.35059I$
$u=\ \ 0.776050+1.038155I$ $a=-1.82906+1.41408I$ $b=\ \ 1.66085+0.53392I$	$5.1887+14.0116I$	$8.27342-8.35059I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.782613 - 0.851544I$ $a = 0.156355 - 0.125337I$ $b = 0.383166 + 0.822290I$	$4.49074 - 0.94301I$	$11.69221 - 0.65426I$
$u = 0.782613 + 0.851544I$ $a = 0.156355 + 0.125337I$ $b = 0.383166 - 0.822290I$	$4.49074 + 0.94301I$	$11.69221 + 0.65426I$
$u = 0.789444 - 1.024388I$ $a = 1.59818 + 1.43811I$ $b = -1.46847 + 0.39347I$	$9.82803 - 9.53725I$	$12.52453 + 6.18800I$
$u = 0.789444 + 1.024388I$ $a = 1.59818 - 1.43811I$ $b = -1.46847 - 0.39347I$	$9.82803 + 9.53725I$	$12.52453 - 6.18800I$
$u = 0.801740 - 1.001461I$ $a = -1.28169 - 1.37086I$ $b = 1.163987 - 0.292596I$	$6.71162 - 4.90299I$	$9.89420 + 2.45670I$
$u = 0.801740 + 1.001461I$ $a = -1.28169 + 1.37086I$ $b = 1.163987 + 0.292596I$	$6.71162 + 4.90299I$	$9.89420 - 2.45670I$
$u = 0.890926 - 0.781825I$ $a = -1.344926 - 0.022767I$ $b = 1.255961 + 0.214939I$	$7.39955 - 1.36157I$	$10.93037 + 2.43186I$
$u = 0.890926 + 0.781825I$ $a = -1.344926 + 0.022767I$ $b = 1.255961 - 0.214939I$	$7.39955 + 1.36157I$	$10.93037 - 2.43186I$
$u = 0.900431 - 0.748621I$ $a = 1.62167 + 0.30941I$ $b = -1.50064 - 0.32030I$	$10.69000 + 3.28668I$	$13.89309 - 1.28472I$
$u = 0.900431 + 0.748621I$ $a = 1.62167 - 0.30941I$ $b = -1.50064 + 0.32030I$	$10.69000 - 3.28668I$	$13.89309 + 1.28472I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.901791 - 0.720382I$ $a = -1.76607 - 0.58698I$ $b = 1.64972 + 0.45528I$	$6.17902 + 7.80504I$	$9.84938 - 3.68302I$
$u = 0.901791 + 0.720382I$ $a = -1.76607 + 0.58698I$ $b = 1.64972 - 0.45528I$	$6.17902 - 7.80504I$	$9.84938 + 3.68302I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2+u+1)^3(u^{52}+4u^{51}+\cdots-2u+1)$
c_2, c_5	$(u^2+u+1)^3(u^{52}+16u^{51}+\cdots-2u+1)$
c_3, c_8	$u^6(u^{52}+u^{51}+\cdots-96u-64)$
c_4	$(u^2-u+1)^3(u^{52}+4u^{51}+\cdots-2u+1)$
c_6, c_7	$(u^3+u^2+2u+1)^2(u^{52}+3u^{51}+\cdots-3u-1)$
c_9, c_{11}	$(u^3+u^2-1)^2(u^{52}+3u^{51}+\cdots+u-34)$
c_{10}	$(u^3-u^2+2u-1)^2(u^{52}+3u^{51}+\cdots-3u-1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y^2+y+1)^3(y^{52}+16y^{51}+\cdots-2y+1)$
c_2, c_5	$(y^2+y+1)^3(y^{52}+44y^{51}+\cdots-286y+1)$
c_3, c_8	$y^6(y^{52}-35y^{51}+\cdots-21504y+4096)$
c_6, c_7, c_{10}	$(y^3+3y^2+2y-1)^2(y^{52}+43y^{51}+\cdots-21y+1)$
c_9, c_{11}	$(y^3-y^2+2y-1)^2(y^{52}-41y^{51}+\cdots-9793y+1156)$