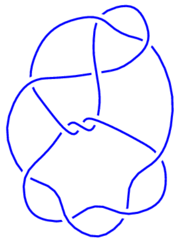
$11a_{97}$ ($K11a_{97}$)



[1]

Arc Sequences

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

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle a^4 + 2a^3 + a^2 - 6a + 3,\ -a^3 - 4a^2 + 3b - 3a + 3,\ -2a^3 - 5a^2 - 6a + 3u + 6\rangle$$
$$I_2^u = \langle u^2 + u + 1,\ b + u + 1,\ a - u - 1\rangle$$
$$I_3^u = \langle u^{41} - 2u^{40} + \cdots + 3u - 3,$$
$$-2228818024373u^{40} + 5180258455780u^{39} + \cdots + 12914375539278a - 3530185376379,$$
$$1708198037735u^{40} + 4948231923855u^{39} + \cdots + 731814613889242b - 39698161867904\rangle$$

There are 3 irreducible components with 47 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.

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

(i) Arc colorings

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

$$a_6 = \begin{pmatrix} 0 \\ \frac{2}{3}a^3 + \frac{5}{3}a^2 + 2a - 2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} 1 \\ \frac{2}{3}a^3 + \frac{5}{3}a^2 + 2a - 3 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} \frac{2}{3}a^3 + \frac{5}{3}a^2 + 2a - 2 \\ -\frac{2}{3}a^3 - \frac{5}{3}a^2 - 2a + 2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{2}{3}a^3 - \frac{5}{3}a^2 - 2a + 2 \\ \frac{2}{3}a^3 + \frac{5}{3}a^2 + 2a - 2 \end{pmatrix}$$

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

$$a_9 = \begin{pmatrix} \frac{2}{3}a^3 + \frac{5}{3}a^2 + 2a - 3 \\ -\frac{1}{3}a^3 - \frac{1}{3}a^2 + 2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{3}a^3 - \frac{1}{3}a^2 + 1 \\ -a^3 - 3a^2 - 4a + 5 \end{pmatrix}$$

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

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

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

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

(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
$u = 0.500000 - 0.866025I$ $a = -1.72474 - 1.57313I$ $b = 0.50000 + 2.28024I$	$-6.57974 - 2.02988I$	$-6.00000 + 3.46410I$
$u = 0.500000 + 0.866025I$ $a = -1.72474 + 1.57313I$ $b = 0.50000 - 2.28024I$	$-6.57974 + 2.02988I$	$-6.00000 - 3.46410I$
$u = 0.500000 - 0.866025I$ $a = 0.724745 - 0.158919I$ $b = 0.500000 - 0.548188I$	$-6.57974 - 2.02988I$	$-6.00000 + 3.46410I$
$u = 0.500000 + 0.866025I$ $a = 0.724745 + 0.158919I$ $b = 0.500000 + 0.548188I$	$-6.57974 + 2.02988I$	$-6.00000 - 3.46410I$

II. $I_2^u = \langle u^2 + u + 1,\ b + u + 1,\ a - u - 1 \rangle$

(i) Arc colorings

$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ -u-1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u+1 \\ -u-1 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u+1 \\ -u-1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u+2 \\ -2u-2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1 \\ u+1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u+1 \\ -u-1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u+1 \\ -u-1 \end{pmatrix}$$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.500000 - 0.866025I$ $a = 0.500000 - 0.866025I$ $b = -0.500000 + 0.866025I$	$-1.64493 + 2.02988I$	$-3.46410I$
$u = -0.500000 + 0.866025I$ $a = 0.500000 + 0.866025I$ $b = -0.500000 - 0.866025I$	$-1.64493 - 2.02988I$	$3.46410I$

III. $\boldsymbol{I_3^u} =$
$\boldsymbol{\langle u^{41}-2u^{40}+\cdots+3u-3,\ -2.23\times10^{12}u^{40}+5.18\times10^{12}u^{39}+\cdots+1.29\times10^{13}a-3.53\times10^{12},\ 1.71\times10^{12}u^{40}+4.95\times10^{12}u^{39}+\cdots+7.32\times10^{13}b-3.97\times10^{13}\rangle}$

(i) Arc colorings

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

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

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

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

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

$$a_8 = \begin{pmatrix}0.172584u^{40}-0.401123u^{39}+\cdots+0.246650u+0.273353\\-0.0233420u^{40}-0.0676159u^{39}+\cdots-1.80205u+0.542462\end{pmatrix}$$

$$a_9 = \begin{pmatrix}0.130291u^{40}-0.140124u^{39}+\cdots+1.20514u-0.237411\\0.0189515u^{40}-0.328615u^{39}+\cdots-2.76054u+1.05323\end{pmatrix}$$

$$a_4 = \begin{pmatrix}0.0472070u^{40}-0.641152u^{39}+\cdots-2.24095u+0.880067\\0.196698u^{40}+0.0788085u^{39}+\cdots+1.04339u-1.78184\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}0.690959u^{40}-1.15909u^{39}+\cdots-0.00321786u-0.758520\\-0.717875u^{40}+1.35352u^{39}+\cdots+0.812265u+0.184990\end{pmatrix}$$

$$a_7 = \begin{pmatrix}-u^5-2u^3-u\\-u^7-u^5+u\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}0.230618u^{40}-0.252059u^{39}+\cdots-0.153593u-2.09818\\-0.0887266u^{40}-0.162139u^{39}+\cdots-0.563961u+1.01840\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}0.230618u^{40}-0.252059u^{39}+\cdots-0.153593u-2.09818\\-0.0887266u^{40}-0.162139u^{39}+\cdots-0.563961u+1.01840\end{pmatrix}$$

(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
$u = -0.822005 - 0.179047I$ $a = -0.775116 - 0.651519I$ $b = 1.148091 - 0.477252I$	$-6.01336 - 4.06181I$	$-3.66785 + 3.84288I$
$u = -0.822005 + 0.179047I$ $a = -0.775116 + 0.651519I$ $b = 1.148091 + 0.477252I$	$-6.01336 + 4.06181I$	$-3.66785 - 3.84288I$
$u = -0.808241 - 0.837807I$ $a = 1.31887 - 0.91833I$ $b = -0.29744 + 1.87603I$	$-10.76739 + 2.97655I$	$-6.11781 - 2.74414I$
$u = -0.808241 + 0.837807I$ $a = 1.31887 + 0.91833I$ $b = -0.29744 - 1.87603I$	$-10.76739 - 2.97655I$	$-6.11781 + 2.74414I$
$u = -0.553626 - 0.237053I$ $a = 0.479923 + 1.216925I$ $b = -0.537241 - 0.109773I$	$-0.16445 - 1.48990I$	$0.43975 + 5.27239I$
$u = -0.553626 + 0.237053I$ $a = 0.479923 - 1.216925I$ $b = -0.537241 + 0.109773I$	$-0.16445 + 1.48990I$	$0.43975 - 5.27239I$
$u = -0.549965 - 0.794582I$ $a = -1.26894 + 0.70417I$ $b = 0.01617 - 1.53684I$	$-4.91839 + 2.21626I$	$0.59639 - 3.86290I$
$u = -0.549965 + 0.794582I$ $a = -1.26894 - 0.70417I$ $b = 0.01617 + 1.53684I$	$-4.91839 - 2.21626I$	$0.59639 + 3.86290I$
$u = -0.528320 - 1.193695I$ $a = 0.52219 + 1.77170I$ $b = -1.31673 - 1.60526I$	$-9.03060 + 9.03490I$	$-6.35139 - 7.01689I$
$u = -0.528320 + 1.193695I$ $a = 0.52219 - 1.77170I$ $b = -1.31673 + 1.60526I$	$-9.03060 - 9.03490I$	$-6.35139 + 7.01689I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.477572-1.096484I$ $a=-0.662533-1.133144I$ $b=\ \ 1.37683+1.11032I$	$-2.54750+5.63680I$	$-3.76761-8.15870I$
$u=-0.477572+1.096484I$ $a=-0.662533+1.133144I$ $b=\ \ 1.37683-1.11032I$	$-2.54750-5.63680I$	$-3.76761+8.15870I$
$u=-0.387666-1.042530I$ $a=\ \ 0.286727+0.046522I$ $b=-0.937246-0.308680I$	$-3.17977+1.35362I$	$-6.58078-0.48937I$
$u=-0.387666+1.042530I$ $a=\ \ 0.286727-0.046522I$ $b=-0.937246+0.308680I$	$-3.17977-1.35362I$	$-6.58078+0.48937I$
$u=-0.353024-1.209190I$ $a=\ \ 0.886737+0.641631I$ $b=-0.212121-0.039074I$	$-10.25757-0.21541I$	$-8.38655+0.44300I$
$u=-0.353024+1.209190I$ $a=\ \ 0.886737-0.641631I$ $b=-0.212121+0.039074I$	$-10.25757+0.21541I$	$-8.38655-0.44300I$
$u=-0.274226-0.759914I$ $a=\ \ 0.07085-1.54503I$ $b=-0.388660+1.032105I$	$-2.03507+1.22420I$	$-5.30574+2.47978I$
$u=-0.274226+0.759914I$ $a=\ \ 0.07085+1.54503I$ $b=-0.388660-1.032105I$	$-2.03507-1.22420I$	$-5.30574-2.47978I$
$u=-0.077478-0.878687I$ $a=\ \ 1.06600-1.67133I$ $b=\ \ 0.54877+1.67327I$	$-7.87303+0.41748I$	$-9.30153+0.50767I$
$u=-0.077478+0.878687I$ $a=\ \ 1.06600+1.67133I$ $b=\ \ 0.54877-1.67327I$	$-7.87303-0.41748I$	$-9.30153-0.50767I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.278438 - 1.307289I$ $a = -0.383720 + 0.224681I$ $b = -0.853784 + 0.125711I$	$19.5976 + 2.5619I$	$-9.48958 - 0.43711I$
$u = 0.278438 + 1.307289I$ $a = -0.383720 - 0.224681I$ $b = -0.853784 - 0.125711I$	$19.5976 - 2.5619I$	$-9.48958 + 0.43711I$
$u = 0.394567 - 1.198377I$ $a = -0.563836 + 0.339653I$ $b = 1.80562 - 0.74664I$	$-11.70312 - 1.34196I$	$-7.30625 + 0.70220I$
$u = 0.394567 + 1.198377I$ $a = -0.563836 - 0.339653I$ $b = 1.80562 + 0.74664I$	$-11.70312 + 1.34196I$	$-7.30625 - 0.70220I$
$u = 0.419594 - 0.580623I$ $a = 0.226420 + 0.874449I$ $b = 0.435854 - 0.678681I$	$0.667792 - 1.033691I$	$4.88372 + 5.04725I$
$u = 0.419594 + 0.580623I$ $a = 0.226420 - 0.874449I$ $b = 0.435854 + 0.678681I$	$0.667792 + 1.033691I$	$4.88372 - 5.04725I$
$u = 0.452830 - 1.177818I$ $a = -0.92923 + 1.38200I$ $b = 1.086792 - 0.743720I$	$-6.74821 - 4.23995I$	$-4.67532 + 3.10579I$
$u = 0.452830 + 1.177818I$ $a = -0.92923 - 1.38200I$ $b = 1.086792 + 0.743720I$	$-6.74821 + 4.23995I$	$-4.67532 - 3.10579I$
$u = 0.458387 - 0.977753I$ $a = 0.600173 - 0.717159I$ $b = -0.704854 + 0.299478I$	$-0.52713 - 2.73009I$	$3.23724 + 4.11462I$
$u = 0.458387 + 0.977753I$ $a = 0.600173 + 0.717159I$ $b = -0.704854 - 0.299478I$	$-0.52713 + 2.73009I$	$3.23724 - 4.11462I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.503223 - 1.190273I$ $a = 0.62585 - 1.34135I$ $b = -1.82748 + 1.76713I$	$-10.92988 - 7.37639I$	$-5.80773 + 5.55165I$
$u = 0.503223 + 1.190273I$ $a = 0.62585 + 1.34135I$ $b = -1.82748 - 1.76713I$	$-10.92988 + 7.37639I$	$-5.80773 - 5.55165I$
$u = 0.588276 - 1.220760I$ $a = -0.14502 + 1.89433I$ $b = 1.31646 - 2.30729I$	$-17.6792 - 12.1700I$	$-7.60138 + 6.11091I$
$u = 0.588276 + 1.220760I$ $a = -0.14502 - 1.89433I$ $b = 1.31646 + 2.30729I$	$-17.6792 + 12.1700I$	$-7.60138 - 6.11091I$
$u = 0.659432 - 0.806619I$ $a = -0.979250 - 0.969514I$ $b = 0.427164 + 1.293522I$	$-2.68106 - 2.54195I$	$-5.78064 + 4.47516I$
$u = 0.659432 + 0.806619I$ $a = -0.979250 + 0.969514I$ $b = 0.427164 - 1.293522I$	$-2.68106 + 2.54195I$	$-5.78064 - 4.47516I$
$u = 0.711439$ $a = 0.256315$ $b = -1.25148$	-3.43392	-0.468188
$u = 0.780672 - 0.127078I$ $a = -0.71324 + 1.67556I$ $b = 0.459261 + 0.338203I$	$-7.81669 + 2.63616I$	$-2.57791 - 2.58719I$
$u = 0.780672 + 0.127078I$ $a = -0.71324 - 1.67556I$ $b = 0.459261 - 0.338203I$	$-7.81669 - 2.63616I$	$-2.57791 + 2.58719I$
$u = 0.940985 - 0.247429I$ $a = 1.20898 - 0.77385I$ $b = -0.919721 - 0.921654I$	$-14.7091 + 6.6164I$	$-5.20491 - 2.71827I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.940985 + 0.247429I$ $a = 1.20898 + 0.77385I$ $b = -0.919721 + 0.921654I$	$-14.7091 - 6.6164I$	$-5.20491 + 2.71827I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2-u+1)^2(u^2+u+1)(u^{41}+2u^{40}+\cdots+3u+3)$
c_2	$(u^2+u+1)^3(u^{41}+22u^{40}+\cdots-33u-9)$
c_3, c_4, c_8	$u^2(u^2+2)^2(u^{41}+u^{40}+\cdots+8u-4)$
c_5	$(u^2-u+1)(u^2+u+1)^2(u^{41}+2u^{40}+\cdots+3u+3)$
c_6	$(u^2-u+1)^2(u^2+u+1)(u^{41}+2u^{40}+\cdots+327u-87)$
c_7	$(u-1)^2(u+1)^4(u^{41}+3u^{40}+\cdots-16u+3)$
c_9	$u^2(u^2+2)^2(u^{41}+u^{40}+\cdots+8u-4)$
c_{10}	$(u-1)^4(u+1)^2(u^{41}+3u^{40}+\cdots-16u+3)$
c_{11}	$(u-1)^4(u+1)^2(u^{41}+3u^{40}+\cdots-16u+3)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^2+y+1)^3(y^{41}+22y^{40}+\cdots-33y-9)$
c_2	$(y^2+y+1)^3(y^{41}-2y^{40}+\cdots+423y-81)$
c_3, c_8	$y^2(y+2)^4(y^{41}+51y^{40}+\cdots-128y-16)$
c_4, c_9	$y^2(y+2)^4(y^{41}+51y^{40}+\cdots-128y-16)$
c_6	$(y^2+y+1)^3(y^{41}-26y^{40}+\cdots-166425y-7569)$
c_7, c_{10}	$(y-1)^6(y^{41}-43y^{40}+\cdots+4y-9)$
c_{11}	$(y-1)^6(y^{41}-43y^{40}+\cdots+4y-9)$