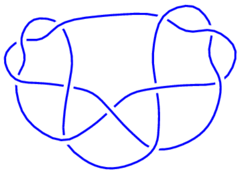
$11a_{306}$ ($K11a_{306}$)



[1]

Arc Sequences

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

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle u + 1 \rangle$$
$$I_2^u = \langle u^9 - u^8 - 4u^7 + 4u^6 + 4u^5 - 4u^4 + u^3 - u - 1 \rangle$$
$$I_3^u = \langle u^{42} - u^{41} + \cdots - 2u^4 + 1 \rangle$$

There are 3 irreducible components with 52 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. $I_1^u = \langle u+1 \rangle$

(i) Arc colorings

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

(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
$u = -1.00000$	1.64493	6.00000

II. $I_2^u = \langle u^9 - u^8 - 4u^7 + 4u^6 + 4u^5 - 4u^4 + u^3 - u - 1\rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^4 + u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^8 - 3u^6 + u^4 + 2u^2 + 1 \\ u^8 - 4u^6 + 4u^4 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} u^8 - 3u^6 + u^5 + u^4 - 2u^3 + 2u^2 + u \\ u^8 + u^7 - 4u^6 - 3u^5 + 4u^4 + 2u^3 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^6 - 2u^4 + u^3 - u \\ u^8 - 3u^6 + u^5 + 2u^4 - 2u^3 + u + 1 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^6 - 2u^4 + u^3 - u^2 - u \\ u^8 - 3u^6 + u^5 + u^4 - 2u^3 + u^2 + u + 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^7 + 2u^5 - u^4 + u^3 + u^2 - u \\ -u^8 - u^7 + 3u^6 + 3u^5 - 2u^4 - u^3 - u^2 - u - 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^7 + 2u^5 - u^4 + u^3 + u^2 - u \\ -u^8 - u^7 + 3u^6 + 3u^5 - 2u^4 - u^3 - u^2 - u - 1 \end{pmatrix}$$

(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
$u = -1.44029 - 0.16872I$	$12.84676 + 4.88120I$	$15.4409 - 3.5107I$
$u = -1.44029 + 0.16872I$	$12.84676 - 4.88120I$	$15.4409 + 3.5107I$
$u = -0.423257 - 0.356395I$	$0.980950 + 0.551491I$	$9.15793 - 4.50455I$
$u = -0.423257 + 0.356395I$	$0.980950 - 0.551491I$	$9.15793 + 4.50455I$
$u = \quad 0.287064 - 0.695105I$	$-1.39752 - 6.41727I$	$2.65899 + 8.21479I$
$u = \quad 0.287064 + 0.695105I$	$-1.39752 + 6.41727I$	$2.65899 - 8.21479I$
$u = \quad 1.30640$	7.01397	12.1823
$u = \quad 1.42328 - 0.27641I$	$9.5593 - 13.5238I$	$11.6511 + 8.3193I$
$u = \quad 1.42328 + 0.27641I$	$9.5593 + 13.5238I$	$11.6511 - 8.3193I$

III. $I_3^u = \langle u^{42} - u^{41} + \cdots - 2u^4 + 1 \rangle$

(i) Arc colorings

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} u \\ u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -u^4 + u^2 + 1 \\ -u^4 + 2u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u^8 - 3u^6 + u^4 + 2u^2 + 1 \\ u^8 - 4u^6 + 4u^4 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -u^{15} + 6u^{13} - 12u^{11} + 6u^9 + 6u^7 - 2u^5 - 4u^3 \\ -u^{15} + 7u^{13} - 18u^{11} + 19u^9 - 4u^7 - 4u^5 + u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u \\ -u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -u^{26} + 11u^{24} + \cdots + u^2 + 1 \\ -u^{26} + 12u^{24} + \cdots - 2u^4 + u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^{30} + 13u^{28} + \cdots + 2u^4 + 1 \\ -u^{32} + 14u^{30} + \cdots - 2u^4 + 2u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^{41} - u^{40} + \cdots - u + 1 \\ -u^{39} + 18u^{37} + \cdots - u + 1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^{41} - u^{40} + \cdots - u + 1 \\ -u^{39} + 18u^{37} + \cdots - u + 1 \end{pmatrix}$$

(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
$u = -1.42800 - 0.24722I$	$11.72577 + 4.35170I$	$14.2357 - 2.9721I$
$u = -1.42800 + 0.24722I$	$11.72577 - 4.35170I$	$14.2357 + 2.9721I$
$u = -1.42429 - 0.12838I$	$6.08429 - 1.09840I$	$10.14786 + 3.17531I$
$u = -1.42429 + 0.12838I$	$6.08429 + 1.09840I$	$10.14786 - 3.17531I$
$u = -1.41609 - 0.27243I$	$4.04389 + 9.94224I$	$7.31059 - 8.24169I$
$u = -1.41609 + 0.27243I$	$4.04389 - 9.94224I$	$7.31059 + 8.24169I$
$u = -1.354035 - 0.243767I$	$1.62697 + 3.23317I$	$3.55215 - 1.92093I$
$u = -1.354035 + 0.243767I$	$1.62697 - 3.23317I$	$3.55215 + 1.92093I$
$u = -1.112717 - 0.206888I$	$4.64745 + 6.55351I$	$8.17560 - 6.03047I$
$u = -1.112717 + 0.206888I$	$4.64745 - 6.55351I$	$8.17560 + 6.03047I$
$u = -1.08927$	1.57667	7.15487
$u = -0.644973$	1.57667	7.15487
$u = -0.619519 - 0.389305I$	$5.30545 - 6.06326I$	$10.03226 + 2.92445I$
$u = -0.619519 + 0.389305I$	$5.30545 + 6.06326I$	$10.03226 - 2.92445I$
$u = -0.301718 - 0.707163I$	$4.04389 + 9.94224I$	$7.31059 - 8.24169I$
$u = -0.301718 + 0.707163I$	$4.04389 - 9.94224I$	$7.31059 + 8.24169I$
$u = -0.274697 - 0.655623I$	$-0.07785 + 2.71696I$	$5.48517 - 3.12164I$
$u = -0.274697 + 0.655623I$	$-0.07785 - 2.71696I$	$5.48517 + 3.12164I$
$u = -0.211792 - 0.670835I$	$-0.40568 + 3.16875I$	$2.95224 - 5.22442I$
$u = -0.211792 + 0.670835I$	$-0.40568 - 3.16875I$	$2.95224 + 5.22442I$
$u = -0.096884 - 0.668841I$	$1.62697 - 3.23317I$	$3.55215 + 1.92093I$
$u = -0.096884 + 0.668841I$	$1.62697 + 3.23317I$	$3.55215 - 1.92093I$
$u = \quad 0.147288 - 0.653126I$	-3.11833	-1.91795
$u = \quad 0.147288 + 0.653126I$	-3.11833	-1.91795
$u = \quad 0.335269 - 0.641117I$	$6.08429 - 1.09840I$	$10.14786 + 3.17531I$
$u = \quad 0.335269 + 0.641117I$	$6.08429 + 1.09840I$	$10.14786 - 3.17531I$
$u = \quad 0.481440 - 0.468716I$	$6.75483 - 2.56601I$	$12.00469 + 3.90900I$
$u = \quad 0.481440 + 0.468716I$	$6.75483 + 2.56601I$	$12.00469 - 3.90900I$
$u = \quad 0.594417 - 0.333320I$	$-0.07785 + 2.71696I$	$5.48517 - 3.12164I$
$u = \quad 0.594417 + 0.333320I$	$-0.07785 - 2.71696I$	$5.48517 + 3.12164I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.082919 - 0.161904I$	$-0.40568 - 3.16875I$	$2.95224 + 5.22442I$
$u = 1.082919 + 0.161904I$	$-0.40568 + 3.16875I$	$2.95224 - 5.22442I$
$u = 1.317379 - 0.229558I$	6.02305	8.97052
$u = 1.317379 + 0.229558I$	6.02305	8.97052
$u = 1.379259 - 0.261235I$	$4.64745 - 6.55351I$	$8.17560 + 6.03047I$
$u = 1.379259 + 0.261235I$	$4.64745 + 6.55351I$	$8.17560 - 6.03047I$
$u = 1.40967 - 0.25849I$	$5.30545 - 6.06326I$	$10.03226 + 2.92445I$
$u = 1.40967 + 0.25849I$	$5.30545 + 6.06326I$	$10.03226 - 2.92445I$
$u = 1.41719 - 0.15750I$	$6.75483 - 2.56601I$	$12.00469 + 3.90900I$
$u = 1.41719 + 0.15750I$	$6.75483 + 2.56601I$	$12.00469 - 3.90900I$
$u = 1.44204 - 0.12357I$	$11.72577 + 4.35170I$	$14.2357 - 2.9721I$
$u = 1.44204 + 0.12357I$	$11.72577 - 4.35170I$	$14.2357 + 2.9721I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_4	$u(u^9 - u^7 - 2u^6 + 8u^5 + 5u^4 - 5u^3 + 5u^2 + 9u + 3)$ $(u^{42} + 3u^{41} + \cdots + 2u - 1)$
c_2, c_6, c_7 c_9, c_{10}	$(u - 1)(u^9 + u^8 - 4u^7 - 4u^6 + 4u^5 + 4u^4 + u^3 - u + 1)$ $(u^{42} + u^{41} + \cdots - 2u^4 + 1)$
c_3, c_{11}	$(u + 1)(u^9 + u^8 + 4u^7 + 2u^6 + 8u^5 + 6u^4 + 9u^3 + 6u^2 + 3u + 1)$ $(u^{42} + 9u^{41} + \cdots + 920u + 113)$
c_5	$(u - 1)(u^9 + u^8 - 4u^7 - 4u^6 + 4u^5 + 4u^4 + u^3 - u + 1)$ $(u^{42} + u^{41} + \cdots - 2u^4 + 1)$
c_8	$(u + 1)(u^9 + 6u^8 + \cdots - 20u - 8)$ $(1 + 4u - 18u^2 - 2u^3 + 67u^4 - 36u^5 - 83u^6 + 79u^7 + 47u^8 - 84u^9 + 56u^{11} - 16u^{12} - 26u^{13}$ -

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	y $(y^9 - 2y^8 + 17y^7 - 30y^6 + 112y^5 - 103y^4 + 131y^3 - 145y^2 + 51y - 9)$ $(y^{42} - y^{41} + \cdots - 24y + 1)$
c_2, c_6, c_7 c_{10}	$(y-1)(y^9 - 9y^8 + 32y^7 - 54y^6 + 38y^5 - 2y^4 + y^3 - 10y^2 + y - 1)$ $(y^{42} - 37y^{41} + \cdots - 4y^2 + 1)$
c_3, c_{11}	$(y-1)(y^9 + 7y^8 + \cdots - 3y - 1)$ $(y^{42} + 11y^{41} + \cdots + 84720y + 12769)$
c_5	$(y-1)(y^9 - 9y^8 + 32y^7 - 54y^6 + 38y^5 - 2y^4 + y^3 - 10y^2 + y - 1)$ $(y^{42} - 37y^{41} + \cdots - 4y^2 + 1)$
c_8	$(y-1)(y^9 + 6y^7 + \cdots - 16y - 64)$ $(-1 + 52y - 474y^2 + 2294y^3 - 6795y^4 + 1.31 \times 10^4 y^5 - 1.81 \times 10^4 y^6 + 1.91 \times 10^4 y^7 - 1.67 \times$
c_9	$(y-1)(y^9 - 9y^8 + 32y^7 - 54y^6 + 38y^5 - 2y^4 + y^3 - 10y^2 + y - 1)$ $(y^{42} - 37y^{41} + \cdots - 4y^2 + 1)$