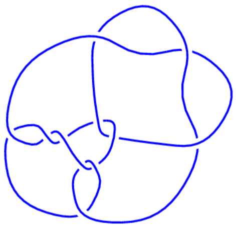
$11n_{98}$ ($K11n_{98}$)



[1]

Arc Sequences

$\longrightarrow \uparrow \longrightarrow \downarrow \longrightarrow \uparrow \longrightarrow \uparrow \longrightarrow \uparrow \longrightarrow \uparrow \longrightarrow \uparrow \longrightarrow \downarrow \longrightarrow \uparrow \longrightarrow \downarrow \longrightarrow \downarrow \longrightarrow$

7 1 8 7 10 2 4 11 6 8 9

Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{4} I_i^u$$

$$I_1^u = \langle u+1,\ a-1,\ 2b+1 \rangle$$
$$I_2^u = \langle a^4+3a^2+1,\ -a^3-2a+u,\ -a^3+a^2+b-2a+2 \rangle$$
$$I_3^u = \langle u^{17}-u^{16}+\cdots-4u^2-1,\ -11u^{16}+14u^{15}+\cdots+32b+3,\ 17u^{16}-26u^{15}+\cdots+16a+7 \rangle$$
$$\begin{aligned} I_4^u = \langle & u^{22}+3u^{21}+\cdots+24u+9, \\ & -749178430u^{21}-3147363456u^{20}+\cdots+7660380639b+10655174784, \\ & -2694752718u^{21}-5680799296u^{20}+\cdots+7660380639a-11072995247 \rangle \end{aligned}$$

There are 4 irreducible components with 44 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. $I_1^u = \langle u+1,\ a-1,\ 2b+1\rangle$

(i) Arc colorings

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes =**unknown**

(iv) Complex Volumes and Cusp Shapes

Solution to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -1.00000$ $a = \quad 1.00000$ $b = -0.500000$	0	-2.25000

II. $I_2^u = \langle a^4 + 3a^2 + 1,\ -a^3 - 2a + u,\ -a^3 + a^2 + b - 2a + 2\rangle$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ a^3 + 2a \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} a \\ a^3 - a^2 + 2a - 2 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} a \\ a^3 - a^2 + a - 2 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} a^3 + a \\ 2a - 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} a^3 + a \\ -a^3 - a - 1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a^3 + a + 1 \\ -a^3 - a - 2 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -a^3 - 2a \\ a^3 + 2a \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} a^2 \\ -a^3 - a^2 - 2a \end{pmatrix}$$
$$a_6 = \begin{pmatrix} a^2 \\ -a^3 - a^2 - 2a \end{pmatrix}$$

(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
$u = - 1.00000I$ $a = - 0.618034I$ $b = -1.61803 - 1.00000I$	-4.27683	-8.00000
$u = 1.00000I$ $a = 0.618034I$ $b = -1.61803 + 1.00000I$	-4.27683	-8.00000
$u = 1.00000I$ $a = - 1.61803I$ $b = 0.618034 + 1.000000I$	-12.1725	-8.00000
$u = - 1.00000I$ $a = 1.61803I$ $b = 0.618034 - 1.000000I$	-12.1725	-8.00000

III. $\boldsymbol{I^u_3 = \langle u^{17} - u^{16} + \cdots - 4u^2 - 1,\ -11u^{16} + 14u^{15} + \cdots + 32b + 3,\ 17u^{16} - 26u^{15} + \cdots + 16a + 7\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -1.06250u^{16} + 1.62500u^{15} + \cdots + 5.43750u - 0.437500 \\ 0.343750u^{16} - 0.437500u^{15} + \cdots - 1.15625u - 0.0937500 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -1.06250u^{16} + 1.62500u^{15} + \cdots + 5.43750u - 0.437500 \\ 0.781250u^{16} - 1.31250u^{15} + \cdots - 2.21875u + 0.468750 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.0625000u^{16} - 0.125000u^{15} + \cdots + 3.93750u - 0.687500 \\ -0.0312500u^{16} + 0.562500u^{15} + \cdots - 0.0312500u - 0.468750 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots - \frac{5}{4}u^2 + \frac{5}{4} \\ \frac{1}{4}u^{15} - \frac{1}{4}u^{14} + \cdots + \frac{5}{4}u^2 - \frac{1}{4} \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -\frac{1}{4}u^{15} + \frac{1}{4}u^{14} + \cdots - \frac{1}{4}u^2 + \frac{5}{4} \\ \frac{1}{4}u^{15} - \frac{1}{4}u^{14} + \cdots + \frac{1}{4}u^2 - \frac{1}{4} \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^2 + 1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{4}u^{16} + \frac{1}{4}u^{15} + \cdots - \frac{1}{4}u^3 + \frac{9}{4}u \\ \frac{1}{4}u^{16} - \frac{1}{4}u^{15} + \cdots + \frac{1}{4}u^3 - \frac{5}{4}u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -\frac{1}{4}u^{16} + \frac{1}{4}u^{15} + \cdots - \frac{1}{4}u^3 + \frac{9}{4}u \\ \frac{1}{4}u^{16} - \frac{1}{4}u^{15} + \cdots + \frac{1}{4}u^3 - \frac{5}{4}u \end{pmatrix}$$

(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
$u = -0.678472 - 1.240021I$ $a = -0.225489 + 1.034292I$ $b = 1.54769 - 1.47366I$	$-4.6382 + 13.7590I$	$-2.60534 - 8.09148I$
$u = -0.678472 + 1.240021I$ $a = -0.225489 - 1.034292I$ $b = 1.54769 + 1.47366I$	$-4.6382 - 13.7590I$	$-2.60534 + 8.09148I$
$u = -0.678341 - 1.093893I$ $a = -0.544216 - 0.556925I$ $b = -0.747437 + 1.180736I$	$0.65577 + 8.75138I$	$0.84209 - 7.19652I$
$u = -0.678341 + 1.093893I$ $a = -0.544216 + 0.556925I$ $b = -0.747437 - 1.180736I$	$0.65577 - 8.75138I$	$0.84209 + 7.19652I$
$u = -0.583285 - 0.914805I$ $a = 1.015806 - 0.479229I$ $b = 0.083408 - 0.398282I$	$-1.75655 + 3.15519I$	$-1.08772 - 4.41422I$
$u = -0.583285 + 0.914805I$ $a = 1.015806 + 0.479229I$ $b = 0.083408 + 0.398282I$	$-1.75655 - 3.15519I$	$-1.08772 + 4.41422I$
$u = -0.239314 - 0.869369I$ $a = -0.54621 + 1.78172I$ $b = 0.092556 - 1.046207I$	$-11.59492 + 1.04318I$	$-1.35194 - 7.04363I$
$u = -0.239314 + 0.869369I$ $a = -0.54621 - 1.78172I$ $b = 0.092556 + 1.046207I$	$-11.59492 - 1.04318I$	$-1.35194 + 7.04363I$
$u = -0.187558 - 0.379982I$ $a = 0.37683 - 2.21344I$ $b = -0.554103 + 0.502263I$	$-1.69658 + 0.80451I$	$-2.69480 - 2.52231I$
$u = -0.187558 + 0.379982I$ $a = 0.37683 + 2.21344I$ $b = -0.554103 - 0.502263I$	$-1.69658 - 0.80451I$	$-2.69480 + 2.52231I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.606656 - 1.024999I$ $a = -0.400728 - 1.170949I$ $b = 0.98051 + 1.70447I$	$-2.68580 - 6.31167I$	$-1.34813 + 5.64607I$
$u = 0.606656 + 1.024999I$ $a = -0.400728 + 1.170949I$ $b = 0.98051 - 1.70447I$	$-2.68580 + 6.31167I$	$-1.34813 - 5.64607I$
$u = 0.635251$ $a = 0.465730$ $b = 0.236283$	0.963952	10.6381
$u = 0.784905 - 0.787523I$ $a = -0.294224 + 0.608642I$ $b = -0.240378 - 1.166900I$	$2.78581 - 2.60100I$	$4.98680 + 3.49505I$
$u = 0.784905 + 0.787523I$ $a = -0.294224 - 0.608642I$ $b = -0.240378 + 1.166900I$	$2.78581 + 2.60100I$	$4.98680 - 3.49505I$
$u = 1.157785 - 0.487195I$ $a = 0.885367 + 0.183583I$ $b = -0.530392 + 0.376632I$	$0.354258 + 0.834124I$	$0.06498 - 5.84789I$
$u = 1.157785 + 0.487195I$ $a = 0.885367 - 0.183583I$ $b = -0.530392 - 0.376632I$	$0.354258 - 0.834124I$	$0.06498 + 5.84789I$

IV.

$\boldsymbol{I_4^u = \langle u^{22}+3u^{21}+\cdots+24u+9,\ -7.49\times10^8u^{21}-3.15\times10^9u^{20}+\cdots+7.66\times10^9b+1.07\times10^{10},\ -2.69\times10^9u^{21}-5.68\times10^9u^{20}+\cdots+7.66\times10^9a-1.11\times10^{10}\rangle}$

(i) Arc colorings

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0.351778u^{21}+0.741582u^{20}+\cdots+5.88891u+1.44549 \\ 0.0977991u^{21}+0.410863u^{20}+\cdots-0.0725632u-1.39095 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.351778u^{21}+0.741582u^{20}+\cdots+5.88891u+1.44549 \\ 0.109720u^{21}+0.727196u^{20}+\cdots+4.29148u+1.43282 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.205132u^{21}+0.242650u^{20}+\cdots+0.665474u-1.10003 \\ 0.0568315u^{21}+0.584282u^{20}+\cdots+4.33085u+2.13109 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 0.242379u^{21}+0.907777u^{20}+\cdots+9.08858u+4.51788 \\ -1 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.106015u^{21}-0.00995851u^{20}+\cdots+2.57184u+2.89213 \\ 0.348395u^{21}+0.917735u^{20}+\cdots+6.51674u+0.625748 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} u^2+1 \\ -u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.0163379u^{21}-0.197272u^{20}+\cdots-1.51350u-0.468886 \\ -0.0531897u^{21}+0.337084u^{20}+\cdots+9.03495u+5.31697 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -0.0163379u^{21}-0.197272u^{20}+\cdots-1.51350u-0.468886 \\ -0.0531897u^{21}+0.337084u^{20}+\cdots+9.03495u+5.31697 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_4^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.081771 - 0.344108I$ $a = -1.198122 + 0.024840I$ $b = 0.500831 + 0.714833I$	$-1.85809 - 7.47524I$	$-0.22908 + 5.55460I$
$u = -1.081771 + 0.344108I$ $a = -1.198122 - 0.024840I$ $b = 0.500831 - 0.714833I$	$-1.85809 + 7.47524I$	$-0.22908 - 5.55460I$
$u = -0.853835 - 0.533591I$ $a = 0.484207 + 0.691979I$ $b = 0.094966 - 1.198131I$	$2.35273 - 3.04152I$	$4.06121 + 2.82242I$
$u = -0.853835 + 0.533591I$ $a = 0.484207 - 0.691979I$ $b = 0.094966 + 1.198131I$	$2.35273 + 3.04152I$	$4.06121 - 2.82242I$
$u = -0.752651 - 0.945347I$ $a = -0.595091 + 0.919581I$ $b = 1.60394 - 0.21728I$	$-8.47148 + 2.94672I$	$-5.79937 - 4.11787I$
$u = -0.752651 + 0.945347I$ $a = -0.595091 - 0.919581I$ $b = 1.60394 + 0.21728I$	$-8.47148 - 2.94672I$	$-5.79937 + 4.11787I$
$u = -0.555909 - 0.782909I$ $a = 0.409273 - 1.283123I$ $b = -0.99043 + 1.31114I$	$-1.31282 + 1.41699I$	$0.791306 - 0.633731I$
$u = -0.555909 + 0.782909I$ $a = 0.409273 + 1.283123I$ $b = -0.99043 - 1.31114I$	$-1.31282 - 1.41699I$	$0.791306 + 0.633731I$
$u = -0.285332 - 0.830788I$ $a = -0.314160 - 0.435233I$ $b = -1.67105 + 0.02430I$	$-3.59460 + 1.13130I$	$-0.01220 - 6.05785I$
$u = -0.285332 + 0.830788I$ $a = -0.314160 + 0.435233I$ $b = -1.67105 - 0.02430I$	$-3.59460 - 1.13130I$	$-0.01220 + 6.05785I$

Solution to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.14927-1.48798I$ $a=-0.174119+0.867773I$ $b=0.067031-0.806341I$	$-8.47148-2.94672I$	$-5.79937+4.11787I$
$u=-0.14927+1.48798I$ $a=-0.174119-0.867773I$ $b=0.067031+0.806341I$	$-8.47148+2.94672I$	$-5.79937-4.11787I$
$u=-0.087548-1.187665I$ $a=0.339357-0.203960I$ $b=-0.011775-0.775560I$	$-3.59460-1.13130I$	$-0.01220+6.05785I$
$u=-0.087548+1.187665I$ $a=0.339357+0.203960I$ $b=-0.011775+0.775560I$	$-3.59460+1.13130I$	$-0.01220-6.05785I$
$u=0.181376-1.048185I$ $a=-0.183886-1.062695I$ $b=2.71263+2.60065I$	-5.48524	0.376257
$u=0.181376+1.048185I$ $a=-0.183886+1.062695I$ $b=2.71263-2.60065I$	-5.48524	0.376257
$u=0.623653-0.552777I$ $a=-1.41909-0.62786I$ $b=-0.134458-0.204944I$	$-1.31282+1.41699I$	$0.791306-0.633731I$
$u=0.623653+0.552777I$ $a=-1.41909+0.62786I$ $b=-0.134458+0.204944I$	$-1.31282-1.41699I$	$0.791306+0.633731I$
$u=0.714099-0.923041I$ $a=0.552364-0.475215I$ $b=0.693911+0.889315I$	$2.35273-3.04152I$	$4.06121+2.82242I$
$u=0.714099+0.923041I$ $a=0.552364+0.475215I$ $b=0.693911-0.889315I$	$2.35273+3.04152I$	$4.06121-2.82242I$

Solution to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=0.747184-1.181246I$ $a=0.265936+0.936246I$ $b=-1.36561-1.12781I$	$-1.85809-7.47524I$	$-0.22908+5.55460I$
$u=0.747184+1.181246I$ $a=0.265936-0.936246I$ $b=-1.36561+1.12781I$	$-1.85809+7.47524I$	$-0.22908-5.55460I$

V. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_3, c_4	$(u+1)(u^2+1)^2(u^{17}-u^{16}+\cdots-4u^2-1)(u^{22}+3u^{21}+\cdots+24u+9)$
c_2	$(u-1)(u+1)^4(u^{17}+5u^{16}+\cdots-8u-1)$ $(u^{22}+11u^{21}+\cdots+432u+81)$
c_5, c_9	$u(u^4+3u^2+1)$ $(u^{11}-u^{10}+2u^9-u^8+4u^7-2u^6+4u^5-u^4+3u^3+u^2+1)^2$ $(u^{17}+3u^{16}+\cdots+22u+8)$
c_6, c_7	$(u-1)(u^2+1)^2(u^{17}-u^{16}+\cdots-4u^2-1)(u^{22}+3u^{21}+\cdots+24u+9)$
c_8	$(u-1)(u^2+u-1)^2$ $(u^{11}+u^{10}-4u^9-3u^8+6u^7+2u^6-2u^5+3u^4-3u^3-3u^2+2u-1)^2$ $(u^{17}+2u^{16}+\cdots+13u+4)$
c_{10}, c_{11}	$(u+1)(u^2-u-1)^2$ $(u^{11}+u^{10}-4u^9-3u^8+6u^7+2u^6-2u^5+3u^4-3u^3-3u^2+2u-1)^2$ $(u^{17}+2u^{16}+\cdots+13u+4)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_4 c_6, c_7	$(y-1)(y+1)^4(y^{17}+5y^{16}+\cdots-8y-1)$ $(y^{22}+11y^{21}+\cdots+432y+81)$
c_2	$(y-1)^5(y^{17}+13y^{16}+\cdots-12y-1)$ $(y^{22}-y^{21}+\cdots+35640y+6561)$
c_5, c_9	$y(y^2+3y+1)^2$ $(-1-2y+y^2+15y^3+29y^4+40y^5+40y^6+32y^7+19y^8+10y^9+3y^{10}+y^{11})^2$ $(y^{17}+9y^{16}+\cdots-12y-64)$
c_8, c_{10}, c_{11}	$(y-1)(y^2-3y+1)^2$ $(-1-2y-15y^2+23y^3+33y^4-76y^5+24y^6+52y^7-65y^8+34y^9-9y^{10}+y^{11})^2$ $(y^{17}-16y^{16}+\cdots+209y-16)$