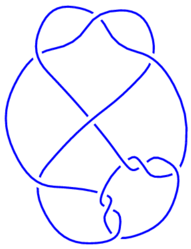
$11a_{340}$ $(K11a_{340})$



[1]

Arc Sequences

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

Solving Sequence

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

Representation Ideals

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

$$\begin{aligned}
I_1^u &= \langle u-1,\ b,\ a+1\rangle \\
I_2^u &= \langle b^2+2,\ u+1,\ -b+a+1\rangle \\
I_3^u &= \langle u^{28}-u^{27}+\cdots+4u+3,\ 10106u^{27}+15488u^{26}+\cdots+23167b-12442, \\
&\qquad -2678u^{27}+93818u^{26}+\cdots+69501a+29788\rangle \\
I_4^u &= \langle u^{18}-u^{17}+\cdots+u-1,\ -u^{17}+u^{16}+\cdots+2b-u,\ -u^{17}+u^{16}+\cdots+2a+2\rangle
\end{aligned}$$

There are 4 irreducible components with 49 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. $I_1^u = \langle u-1,\ b,\ a+1\rangle$

(i) Arc colorings

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

(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
$u = 1.00000$ $a = -1.00000$ $b = 0$	-3.28987	-12.0000

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

(i) Arc colorings

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

(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
$u = -1.00000$ $a = -1.00000 - 1.41421I$ $b = \quad - 1.41421I$	1.64493	−12.0000
$u = -1.00000$ $a = -1.00000 + 1.41421I$ $b = \quad 1.41421I$	1.64493	−12.0000

III. $\boldsymbol{I_3^u = \langle u^{28} - u^{27} + \cdots + 4u + 3,\ 10106u^{27} + 15488u^{26} + \cdots + 23167b - 12442,\ -2678u^{27} + 93818u^{26} + \cdots + 69501a + 29788\rangle}$

(i) Arc colorings

$$a_1 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 0.0385318u^{27} - 1.34988u^{26} + \cdots + 5.05026u - 0.428598 \\ -0.436224u^{27} - 0.668537u^{26} + \cdots + 2.72452u + 0.537057 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} -0.0913080u^{27} - 0.907268u^{26} + \cdots + 9.06761u + 3.11796 \\ 1.33224u^{27} - 0.0627617u^{26} + \cdots - 1.99719u - 2.53352 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 0.182645u^{27} - 0.0610063u^{26} + \cdots + 3.06646u + 1.23427 \\ -0.202961u^{27} + 0.193206u^{26} + \cdots + 4.54707u + 1.81845 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$
$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 0.517532u^{27} - 0.673573u^{26} + \cdots + 0.623876u - 1.04266 \\ 0.0330211u^{27} - 0.183710u^{26} + \cdots + 0.928433u + 0.531877 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ u^4 - 2u^2 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.489374u^{27} - 0.456353u^{26} + \cdots + 6.77946u + 2.88593 \\ 0.306729u^{27} - 0.395347u^{26} + \cdots + 5.71300u + 1.65166 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.489374u^{27} - 0.456353u^{26} + \cdots + 6.77946u + 2.88593 \\ 0.306729u^{27} - 0.395347u^{26} + \cdots + 5.71300u + 1.65166 \end{pmatrix}$$

(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
$u = -1.326523 - 0.267150I$ $a = -0.781123 + 0.816336I$ $b = 0.681829 + 0.299736I$	$-2.72606 - 5.07185I$	$-13.6715 + 6.3313I$
$u = -1.326523 + 0.267150I$ $a = -0.781123 - 0.816336I$ $b = 0.681829 - 0.299736I$	$-2.72606 + 5.07185I$	$-13.6715 - 6.3313I$
$u = -1.279310 - 0.128341I$ $a = 1.170055 - 0.539411I$ $b = -0.600586 - 0.155632I$	$-4.65252 - 0.62859I$	$-18.3165 + 1.4225I$
$u = -1.279310 + 0.128341I$ $a = 1.170055 + 0.539411I$ $b = -0.600586 + 0.155632I$	$-4.65252 + 0.62859I$	$-18.3165 - 1.4225I$
$u = -1.107095 - 0.327676I$ $a = 0.27018 - 1.57289I$ $b = 0.14277 - 1.43183I$	$4.53640 + 0.47055I$	$-6.67171 + 0.18349I$
$u = -1.107095 + 0.327676I$ $a = 0.27018 + 1.57289I$ $b = 0.14277 + 1.43183I$	$4.53640 - 0.47055I$	$-6.67171 - 0.18349I$
$u = -1.046481 - 0.508013I$ $a = -0.39612 + 1.59177I$ $b = -0.228017 + 1.369794I$	$0.22261 + 3.62879I$	$-12.33383 - 2.63226I$
$u = -1.046481 + 0.508013I$ $a = -0.39612 - 1.59177I$ $b = -0.228017 - 1.369794I$	$0.22261 - 3.62879I$	$-12.33383 + 2.63226I$
$u = -0.604217 - 0.596477I$ $a = 0.71259 - 1.75865I$ $b = -0.135360 - 1.128163I$	$-1.84948 - 2.19128I$	$-13.23919 + 3.85718I$
$u = -0.604217 + 0.596477I$ $a = 0.71259 + 1.75865I$ $b = -0.135360 + 1.128163I$	$-1.84948 + 2.19128I$	$-13.23919 - 3.85718I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.231158 - 0.581473I$ $a = 0.179979 - 1.396785I$ $b = 0.373222 - 0.543854I$	$-1.59516 - 1.40484I$	$-10.49073 + 0.52948I$
$u = -0.231158 + 0.581473I$ $a = 0.179979 + 1.396785I$ $b = 0.373222 + 0.543854I$	$-1.59516 + 1.40484I$	$-10.49073 - 0.52948I$
$u = -0.207702 - 0.874853I$ $a = -0.76330 + 2.69024I$ $b = 0.26614 + 1.42034I$	$2.77434 - 8.53123I$	$-9.27652 + 6.18031I$
$u = -0.207702 + 0.874853I$ $a = -0.76330 - 2.69024I$ $b = 0.26614 - 1.42034I$	$2.77434 + 8.53123I$	$-9.27652 - 6.18031I$
$u = -0.050123 - 0.614541I$ $a = -1.56388 + 3.12175I$ $b = 0.14277 + 1.43183I$	$4.53640 - 0.47055I$	$-6.67171 - 0.18349I$
$u = -0.050123 + 0.614541I$ $a = -1.56388 - 3.12175I$ $b = 0.14277 - 1.43183I$	$4.53640 + 0.47055I$	$-6.67171 + 0.18349I$
$u = 0.258114 - 0.789598I$ $a = 0.280001 - 0.820092I$ $b = 0.681829 - 0.299736I$	$-2.72606 + 5.07185I$	$-13.6715 - 6.3313I$
$u = 0.258114 + 0.789598I$ $a = 0.280001 + 0.820092I$ $b = 0.681829 + 0.299736I$	$-2.72606 - 5.07185I$	$-13.6715 + 6.3313I$
$u = 0.876174 - 0.456467I$ $a = -0.156698 + 0.158857I$ $b = -0.600586 - 0.155632I$	$-4.65252 - 0.62859I$	$-18.3165 + 1.4225I$
$u = 0.876174 + 0.456467I$ $a = -0.156698 - 0.158857I$ $b = -0.600586 + 0.155632I$	$-4.65252 + 0.62859I$	$-18.3165 - 1.4225I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.220941 - 0.199536I$ $a = 0.0362241 + 0.0803915I$ $b = 0.373222 + 0.543854I$	$-1.59516 + 1.40484I$	$-10.49073 - 0.52948I$
$u = 1.220941 + 0.199536I$ $a = 0.0362241 - 0.0803915I$ $b = 0.373222 - 0.543854I$	$-1.59516 - 1.40484I$	$-10.49073 + 0.52948I$
$u = 1.314520 - 0.249885I$ $a = 2.09728 + 0.73724I$ $b = -0.228017 + 1.369794I$	$0.22261 + 3.62879I$	$-12.33383 - 2.63226I$
$u = 1.314520 + 0.249885I$ $a = 2.09728 - 0.73724I$ $b = -0.228017 - 1.369794I$	$0.22261 - 3.62879I$	$-12.33383 + 2.63226I$
$u = 1.332564 - 0.035926I$ $a = 0.609734 - 0.464487I$ $b = -0.135360 + 1.128163I$	$-1.84948 + 2.19128I$	$-13.23919 - 3.85718I$
$u = 1.332564 + 0.035926I$ $a = 0.609734 + 0.464487I$ $b = -0.135360 - 1.128163I$	$-1.84948 - 2.19128I$	$-13.23919 + 3.85718I$
$u = 1.350296 - 0.328090I$ $a = -1.86159 - 1.26768I$ $b = 0.26614 - 1.42034I$	$2.77434 + 8.53123I$	$-9.27652 - 6.18031I$
$u = 1.350296 + 0.328090I$ $a = -1.86159 + 1.26768I$ $b = 0.26614 + 1.42034I$	$2.77434 - 8.53123I$	$-9.27652 + 6.18031I$

IV.

$$I_4^u = \langle u^{18} - u^{17} + \cdots + u - 1,\ -u^{17} + u^{16} + \cdots + 2b - u,\ -u^{17} + u^{16} + \cdots + 2a + 2\rangle$$

(i) Arc colorings

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

$$a_8 = \begin{pmatrix} \frac{1}{2}u^{17} - \frac{1}{2}u^{16} + \cdots + \frac{1}{2}u - 1 \\ \frac{1}{2}u^{17} - \frac{1}{2}u^{16} + \cdots + \frac{7}{2}u^2 + \frac{1}{2}u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} \frac{1}{2}u^{16} - \frac{1}{2}u^{15} + \cdots + \frac{3}{2}u + \frac{1}{2} \\ \frac{1}{2}u^{17} - \frac{9}{2}u^{15} + \cdots + 2u - \frac{1}{2} \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^3 - 2u \\ \frac{1}{2}u^{16} - \frac{1}{2}u^{15} + \cdots + \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^3 + 2u \\ -u^3 + u \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -1 \\ \frac{1}{2}u^{17} - \frac{1}{2}u^{16} + \cdots + \frac{5}{2}u^2 + \frac{1}{2}u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u \\ -u^3 + u \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} -u \\ \frac{1}{2}u^{16} - \frac{1}{2}u^{15} + \cdots + \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u \\ \frac{1}{2}u^{16} - \frac{1}{2}u^{15} + \cdots + \frac{1}{2}u + \frac{1}{2} \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-1.47585$ $a=-0.647879$ $b=\ \ 0.809273$	-12.4435	-20.5974
$u=-1.40726-0.31923I$ $a=\ \ 0.552649-0.790781I$ $b=-0.775406-0.334408I$	$-8.01786-9.07750I$	$-17.1458+6.7523I$
$u=-1.40726+0.31923I$ $a=\ \ 0.552649+0.790781I$ $b=-0.775406+0.334408I$	$-8.01786+9.07750I$	$-17.1458-6.7523I$
$u=-1.280704-0.219250I$ $a=-0.16070+1.67435I$ $b=-0.10546+1.52636I$	$0.70132-2.48793I$	$-13.16040+3.49031I$
$u=-1.280704+0.219250I$ $a=-0.16070-1.67435I$ $b=-0.10546-1.52636I$	$0.70132+2.48793I$	$-13.16040-3.49031I$
$u=-0.425953-0.304035I$ $a=-1.29555+0.95087I$ $b=\ \ 0.042738+1.319354I$	$3.51645-1.27379I$	$-7.18490+5.17198I$
$u=-0.425953+0.304035I$ $a=-1.29555-0.95087I$ $b=\ \ 0.042738-1.319354I$	$3.51645+1.27379I$	$-7.18490-5.17198I$
$u=-0.137532-0.780394I$ $a=\ \ 0.99691-2.83147I$ $b=-0.21362-1.42778I$	$7.46429-4.53021I$	$-4.17935+4.22610I$
$u=-0.137532+0.780394I$ $a=\ \ 0.99691+2.83147I$ $b=-0.21362+1.42778I$	$7.46429+4.53021I$	$-4.17935-4.22610I$
$u=\ \ 0.095417-0.660635I$ $a=-0.138105+1.002686I$ $b=-0.550592+0.360230I$	$1.75017+1.69601I$	$-7.17935-4.88688I$

Solution to I_4^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.095417 + 0.660635I$ $a = -0.138105 - 1.002686I$ $b = -0.550592 - 0.360230I$	$1.75017 - 1.69601I$	$-7.17935 + 4.88688I$
$u = 0.279608$ $a = -0.789943$ $b = 0.348560$	-0.533570	-18.7260
$u = 1.384260 - 0.253787I$ $a = -0.041054 - 0.239185I$ $b = -0.536324 - 0.718976I$	$-6.73513 + 4.54783I$	$-15.8301 - 1.8142I$
$u = 1.384260 + 0.253787I$ $a = -0.041054 + 0.239185I$ $b = -0.536324 + 0.718976I$	$-6.73513 - 4.54783I$	$-15.8301 + 1.8142I$
$u = 1.40081 - 0.36740I$ $a = 1.58684 + 1.43812I$ $b = -0.30373 + 1.44463I$	$-2.32354 + 12.99623I$	$-12.9688 - 7.3705I$
$u = 1.40081 + 0.36740I$ $a = 1.58684 - 1.43812I$ $b = -0.30373 - 1.44463I$	$-2.32354 - 12.99623I$	$-12.9688 + 7.3705I$
$u = 1.46909 - 0.08730I$ $a = -0.782078 - 0.441495I$ $b = 0.363479 - 1.186888I$	$-8.78390 + 4.21996I$	$-16.6895 - 3.5646I$
$u = 1.46909 + 0.08730I$ $a = -0.782078 + 0.441495I$ $b = 0.363479 + 1.186888I$	$-8.78390 - 4.21996I$	$-16.6895 + 3.5646I$

V. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_2, c_7	$u(u^2+2)$ $(1-u+4u^3-4u^4+2u^5+4u^6-10u^7+19u^8-13u^9+18u^{10}-6u^{11}+7u^{12}-u^{13}+u^{14})^2$ $(u^{18}+3u^{17}+\cdots+4u+2)$
c_3	u^3 $(3+7u+12u^2+12u^3+10u^4+10u^5+14u^6+22u^7+23u^8+19u^9+14u^{10}+10u^{11}+7u^{12}$ $(u^{18}+3u^{17}+\cdots-144u^2+16)$
c_4, c_5, c_9 c_{10}, c_{11}	$(u-1)^2(u+1)(u^{18}+u^{17}+\cdots-u-1)(u^{28}+u^{27}+\cdots-4u+3)$
c_6	$(u-1)(u+1)^2(u^{18}+u^{17}+\cdots-u-1)(u^{28}+u^{27}+\cdots-4u+3)$
c_8	$u(u^2+2)$ $(1+3u+4u^2-2u^4-12u^5+8u^6+12u^7+9u^8-5u^9+6u^{10}+2u^{11}+u^{12}-u^{13}+u^{14})^2$ $(u^{18}+3u^{17}+\cdots+24u+34)$

VI. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_2, c_7	$y(y+2)^2$ $(1 - y - 4y^3 + 18y^4 + 54y^5 + 10y^6 + 8y^7 + 221y^8 + 447y^9 + 422y^{10} + 228y^{11} + 73y^{12} + 13y^{13}$ $(y^{18} + 17y^{17} + \cdots - 32y + 4)$
c_3	y^3 $(9 + 23y + 36y^2 + 40y^3 + 26y^4 + 22y^5 - 2y^6 - 48y^7 - 23y^8 - y^9 + 34y^{10} + 28y^{11} + 17y^{12} + 5$ $(y^{18} + 5y^{17} + \cdots - 4608y + 256)$
c_4, c_5, c_6 c_9, c_{10}, c_{11}	$(y-1)^3(y^{18} - 19y^{17} + \cdots - 13y + 1)(y^{28} - 21y^{27} + \cdots + 32y + 9)$
c_8	$y(y+2)^2$ $(1 - y + 12y^2 + 72y^3 + 14y^4 - 62y^5 + 354y^6 - 128y^7 + 349y^8 + 23y^9 + 114y^{10} + 16y^{11} + 17y$ $(y^{18} + 5y^{17} + \cdots - 4384y + 1156)$