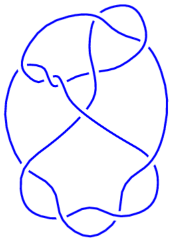
$11n_{140}$ ($K11n_{140}$)



[1]

Arc Sequences

$$\longrightarrow \uparrow_{8} \longrightarrow \downarrow_{1} \longrightarrow \uparrow_{9} \longrightarrow \uparrow_{8} \longrightarrow \uparrow_{11} \longrightarrow \uparrow_{10} \longrightarrow \uparrow_{2} \longrightarrow \uparrow_{4} \longrightarrow \uparrow_{7} \longrightarrow \uparrow_{6} \longrightarrow \downarrow_{9} \longrightarrow$$

Solving Sequence

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

Representation Ideals

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

$$\begin{aligned}
I_1^u &= \langle b^4 - 2b^3 + b^2 + 5,\ 2b^3 - 3b^2 - 4b + 9a - 2,\ 2b^3 - 3b^2 + 5b + 9u - 2\rangle \\
I_2^u &= \langle u^{13} + 2u^{11} - u^{10} + 6u^9 - u^8 + 6u^7 - 3u^6 + 8u^5 + 4u^3 + u + 1, \\
&\quad - u^{12} - u^{11} - u^{10} - 4u^8 - 5u^7 - u^6 + 2u^5 - 4u^4 - 6u^3 + 4a + 6u - 1, \\
&\quad - u^{12} - u^{11} - u^{10} - 4u^8 - 5u^7 - u^6 + 2u^5 - 4u^4 - 6u^3 + 4b + 2u - 1\rangle \\
I_3^u &= \langle u^{16} + u^{15} + \cdots + 4u + 5,\ -3078u^{15} + 127u^{14} + \cdots + 13139b - 7442, \\
&\quad 13544u^{15} + 25224u^{14} + \cdots + 65695a + 74281\rangle
\end{aligned}$$

There are 3 irreducible components with 33 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. $\boldsymbol{I^u_1 = \langle b^4 - 2b^3 + b^2 + 5,\ 2b^3 - 3b^2 - 4b + 9a - 2,\ 2b^3 - 3b^2 + 5b + 9u - 2\rangle}$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix} 0 \\ -\frac{2}{9}b^3 + \frac{1}{3}b^2 - \frac{5}{9}b + \frac{2}{9} \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -\frac{2}{9}b^3 + \frac{1}{3}b^2 - \frac{5}{9}b + \frac{2}{9} \\ -\frac{2}{9}b^3 + \frac{1}{3}b^2 - \frac{5}{9}b + \frac{2}{9} \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -\frac{2}{9}b^3 + \frac{1}{3}b^2 + \frac{4}{9}b + \frac{2}{9} \\ b \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -\frac{2}{9}b^3 + \frac{1}{3}b^2 + \frac{4}{9}b + \frac{2}{9} \\ -\frac{2}{9}b^3 + \frac{1}{3}b^2 + \frac{13}{9}b + \frac{2}{9} \end{pmatrix}$$

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

$$a_3 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -\frac{1}{9}b^3 - \frac{1}{3}b^2 + \frac{2}{9}b + \frac{10}{9} \\ -\frac{1}{9}b^3 - \frac{1}{3}b^2 + \frac{2}{9}b + \frac{19}{9} \end{pmatrix}$$

$$a_6 = \begin{pmatrix} \frac{1}{3}b^3 + \frac{1}{3}b - \frac{1}{3} \\ \frac{2}{3}b^3 - \frac{1}{3}b - \frac{2}{3} \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} \frac{2}{9}b^3 - \frac{1}{3}b^2 - \frac{4}{9}b - \frac{11}{9} \\ \frac{1}{9}b^3 - \frac{2}{3}b^2 - \frac{2}{9}b - \frac{19}{9} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{9}b^3 - \frac{1}{3}b^2 + \frac{2}{9}b + \frac{1}{9} \\ -\frac{1}{9}b^3 - \frac{1}{3}b^2 + \frac{2}{9}b + \frac{10}{9} \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -\frac{1}{9}b^3 - \frac{1}{3}b^2 + \frac{2}{9}b + \frac{1}{9} \\ -\frac{1}{9}b^3 - \frac{1}{3}b^2 + \frac{2}{9}b + \frac{10}{9} \end{pmatrix}$$

(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
$u = 1.00000I$ $a = -0.618034$ $b = -0.618034 - 1.000000I$	-4.27683	-4.00000
$u = -1.00000I$ $a = -0.618034$ $b = -0.618034 + 1.000000I$	-4.27683	-4.00000
$u = 1.00000I$ $a = 1.61803$ $b = 1.61803 - 1.00000I$	-12.1725	-4.00000
$u = -1.00000I$ $a = 1.61803$ $b = 1.61803 + 1.00000I$	-12.1725	-4.00000

II.

$$\boldsymbol{I_2^u = \langle u^{13}+2u^{11}+\cdots+u+1,\ -u^{12}-u^{11}+\cdots+4a-1,\ -u^{12}-u^{11}+\cdots+4b-1\rangle}$$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix}0\\u\end{pmatrix}$$

$$a_8 = \begin{pmatrix}u\\u\end{pmatrix}$$

$$a_9 = \begin{pmatrix}\frac{1}{4}u^{12}+\frac{1}{4}u^{11}+\cdots-\frac{3}{2}u+\frac{1}{4}\\ \frac{1}{4}u^{12}+\frac{1}{4}u^{11}+\cdots-\frac{1}{2}u+\frac{1}{4}\end{pmatrix}$$

$$a_{10} = \begin{pmatrix}\frac{1}{4}u^{12}+\frac{1}{4}u^{11}+\cdots-\frac{3}{2}u+\frac{1}{4}\\ \frac{1}{2}u^{12}+\frac{1}{2}u^{11}+\cdots+4u^3+\frac{1}{2}\end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix}\frac{1}{4}u^{12}-\frac{1}{4}u^{11}+\cdots-\frac{1}{2}u^2+\frac{3}{4}\\ \frac{1}{4}u^{12}-\frac{1}{4}u^{11}+\cdots-\frac{1}{2}u^2-\frac{1}{4}\end{pmatrix}$$

$$a_6 = \begin{pmatrix}-u^{12}-\frac{3}{2}u^{10}+\cdots-2u-\frac{1}{2}\\ -\frac{5}{4}u^{12}+\frac{3}{4}u^{11}+\cdots-\frac{3}{2}u-\frac{1}{4}\end{pmatrix}$$

$$a_{11} = \begin{pmatrix}\frac{1}{2}u^{12}-u^{11}+\cdots-\frac{1}{2}u-\frac{1}{2}\\ \frac{1}{4}u^{12}-\frac{3}{4}u^{11}+\cdots-\frac{1}{2}u-\frac{5}{4}\end{pmatrix}$$

$$a_5 = \begin{pmatrix}\frac{1}{4}u^{12}-\frac{1}{4}u^{11}+\cdots-\frac{3}{2}u^2+\frac{3}{4}\\ \frac{1}{4}u^{12}-\frac{1}{4}u^{11}+\cdots-\frac{3}{2}u^2-\frac{1}{4}\end{pmatrix}$$

$$a_5 = \begin{pmatrix}\frac{1}{4}u^{12}-\frac{1}{4}u^{11}+\cdots-\frac{3}{2}u^2+\frac{3}{4}\\ \frac{1}{4}u^{12}-\frac{1}{4}u^{11}+\cdots-\frac{3}{2}u^2-\frac{1}{4}\end{pmatrix}$$

(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
$u = -0.793875 - 0.936102I$ $a = -0.153818 + 0.608179I$ $b = -0.947693 - 0.327923I$	$3.03190 + 3.86102I$	$7.31704 - 2.47395I$
$u = -0.793875 + 0.936102I$ $a = -0.153818 - 0.608179I$ $b = -0.947693 + 0.327923I$	$3.03190 - 3.86102I$	$7.31704 + 2.47395I$
$u = -0.717554 - 1.160667I$ $a = -1.064973 - 0.484757I$ $b = -1.78253 - 1.64542I$	$-5.31862 + 11.41155I$	$1.59544 - 6.78413I$
$u = -0.717554 + 1.160667I$ $a = -1.064973 + 0.484757I$ $b = -1.78253 + 1.64542I$	$-5.31862 - 11.41155I$	$1.59544 + 6.78413I$
$u = -0.447199$ $a = 0.834773$ $b = 0.387574$	0.678852	14.6197
$u = -0.301931 - 0.795374I$ $a = 1.81517 + 0.71084I$ $b = 1.51324 - 0.08454I$	$-11.18849 + 1.28224I$	$2.05046 - 5.61257I$
$u = -0.301931 + 0.795374I$ $a = 1.81517 - 0.71084I$ $b = 1.51324 + 0.08454I$	$-11.18849 - 1.28224I$	$2.05046 + 5.61257I$
$u = 0.426416 - 0.596732I$ $a = -1.016068 + 0.699176I$ $b = -0.589652 + 0.102444I$	$-2.28202 - 1.46619I$	$3.02331 + 4.77758I$
$u = 0.426416 + 0.596732I$ $a = -1.016068 - 0.699176I$ $b = -0.589652 - 0.102444I$	$-2.28202 + 1.46619I$	$3.02331 - 4.77758I$
$u = 0.760740 - 1.064255I$ $a = 0.682292 + 0.105562I$ $b = 1.44303 - 0.95869I$	$2.12458 - 8.30943I$	$4.97203 + 7.67433I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.760740 + 1.064255I$ $a = 0.682292 - 0.105562I$ $b = 1.44303 + 0.95869I$	$2.12458 + 8.30943I$	$4.97203 - 7.67433I$
$u = 0.849803 - 0.688633I$ $a = -0.679991 + 1.072964I$ $b = 0.169812 + 0.384330I$	$-2.33364 - 0.79324I$	$4.73185 + 2.01069I$
$u = 0.849803 + 0.688633I$ $a = -0.679991 - 1.072964I$ $b = 0.169812 - 0.384330I$	$-2.33364 + 0.79324I$	$4.73185 - 2.01069I$

III. $\boldsymbol{I_3^u = \langle u^{16} + u^{15} + \cdots + 4u + 5,\ -3078u^{15} + 127u^{14} + \cdots + 13139b - 7442,\ 13544u^{15} + 25224u^{14} + \cdots + 65695a + 74281\rangle}$

(i) Arc colorings

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

$$a_7 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.206165u^{15} - 0.383956u^{14} + \cdots - 0.862410u - 1.13069 \\ 0.234264u^{15} - 0.00966588u^{14} + \cdots + 3.37157u + 0.566405 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.206165u^{15} - 0.383956u^{14} + \cdots - 0.862410u - 1.13069 \\ 0.00365325u^{15} - 0.261359u^{14} + \cdots + 1.62958u - 0.322551 \end{pmatrix}$$

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

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

$$a_4 = \begin{pmatrix} 0.245559u^{15} - 0.00103509u^{14} + \cdots - 0.0153284u + 0.485851 \\ 0.0661390u^{15} + 0.0599741u^{14} + \cdots + 0.0646168u + 2.20215 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.177883u^{15} + 0.109354u^{14} + \cdots - 1.32177u - 0.211112 \\ -0.313418u^{15} + 0.00578431u^{14} + \cdots - 0.679047u - 0.244463 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.0677677u^{15} + 0.0517848u^{14} + \cdots - 0.321364u + 1.51668 \\ -0.177791u^{15} + 0.0528198u^{14} + \cdots - 0.306035u + 1.03082 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.179420u^{15} - 0.0610092u^{14} + \cdots - 0.0799452u - 0.716295 \\ 1 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.179420u^{15} - 0.0610092u^{14} + \cdots - 0.0799452u - 0.716295 \\ 1 \end{pmatrix}$$

(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
$u=-0.969644-0.496042I$ $a=-0.469630-1.320802I$ $b=\ \ 0.547560-0.225291I$	$-3.28987-5.23868I$	$4.00000+3.04258I$
$u=-0.969644+0.496042I$ $a=-0.469630+1.320802I$ $b=\ \ 0.547560+0.225291I$	$-3.28987+5.23868I$	$4.00000-3.04258I$
$u=-0.822874-0.843581I$ $a=\ \ 0.688799-0.095178I$ $b=\ \ 1.21750+0.81461I$	$3.31972+2.18536I$	$7.58319-3.14055I$
$u=-0.822874+0.843581I$ $a=\ \ 0.688799+0.095178I$ $b=\ \ 1.21750-0.81461I$	$3.31972-2.18536I$	$7.58319+3.14055I$
$u=-0.548614-0.832668I$ $a=-1.30579-0.78369I$ $b=-0.10695-2.12385I$	$-9.89946+2.18536I$	$0.41681-3.14055I$
$u=-0.548614+0.832668I$ $a=-1.30579+0.78369I$ $b=-0.10695+2.12385I$	$-9.89946-2.18536I$	$0.41681+3.14055I$
$u=-0.098471-1.335407I$ $a=\ \ 1.126508+0.130861I$ $b=\ \ 1.82851-0.11119I$	$-9.89946-2.18536I$	$0.41681+3.14055I$
$u=-0.098471+1.335407I$ $a=\ \ 1.126508-0.130861I$ $b=\ \ 1.82851+0.11119I$	$-9.89946+2.18536I$	$0.41681-3.14055I$
$u=\ \ 0.043421-1.182101I$ $a=-0.366105+0.252903I$ $b=-0.680197-0.148154I$	$-3.28987+1.04600I$	$4.00000-6.68545I$
$u=\ \ 0.043421+1.182101I$ $a=-0.366105-0.252903I$ $b=-0.680197+0.148154I$	$-3.28987-1.04600I$	$4.00000+6.68545I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.239639 - 0.738346I$ $a = 0.656304 + 0.170359I$ $b = -0.02444 - 1.49870I$	$-3.28987 - 1.04600I$	$4.00000 + 6.68545I$
$u = 0.239639 + 0.738346I$ $a = 0.656304 - 0.170359I$ $b = -0.02444 + 1.49870I$	$-3.28987 + 1.04600I$	$4.00000 - 6.68545I$
$u = 0.769845 - 1.017622I$ $a = -1.040495 + 0.590810I$ $b = -1.31351 + 1.47948I$	$-3.28987 - 5.23868I$	$4.00000 + 3.04258I$
$u = 0.769845 + 1.017622I$ $a = -1.040495 - 0.590810I$ $b = -1.31351 - 1.47948I$	$-3.28987 + 5.23868I$	$4.00000 - 3.04258I$
$u = 0.886697 - 0.673651I$ $a = -0.189590 - 0.711015I$ $b = -0.968470 + 0.262966I$	$3.31972 + 2.18536I$	$7.58319 - 3.14055I$
$u = 0.886697 + 0.673651I$ $a = -0.189590 + 0.711015I$ $b = -0.968470 - 0.262966I$	$3.31972 - 2.18536I$	$7.58319 + 3.14055I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_3, c_4 c_7, c_8	$(u^2+1)^2(u^{13}+2u^{11}-u^{10}+6u^9-u^8+6u^7-3u^6+8u^5+4u^3+u+1)$ $(u^{16}+u^{15}+\cdots+4u+5)$
c_2	$(u+1)^4(u^{13}+4u^{12}+\cdots+u-1)(u^{16}+7u^{15}+\cdots+124u+25)$
c_5, c_6, c_9 c_{10}	$(u^4+3u^2+1)(u^8-u^7+5u^6-4u^5+7u^4-4u^3+2u^2+1)^2$ $(u^{13}+3u^{12}+\cdots-3u-2)$
c_{11}	$(u^2-u-1)^2(u^8+u^7+5u^6+4u^5+7u^4+4u^3+2u^2+1)^2$ $(u^{13}+3u^{12}+\cdots+41u+24)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_4 c_7, c_8	$(y+1)^4(y^{13}+4y^{12}+\cdots+y-1)(y^{16}+7y^{15}+\cdots+124y+25)$
c_2	$(y-1)^4(y^{13}+16y^{12}+\cdots+17y-1)(y^{16}+3y^{15}+\cdots+824y+625)$
c_5, c_6, c_9 c_{10}	$(y^2+3y+1)^2$ $(y^8+9y^7+31y^6+50y^5+39y^4+22y^3+18y^2+4y+1)^2$ $(y^{13}+15y^{12}+\cdots+17y-4)$
c_{11}	$(y^2-3y+1)^2$ $(y^8+9y^7+31y^6+50y^5+39y^4+22y^3+18y^2+4y+1)^2$ $(y^{13}+3y^{12}+\cdots+6385y-576)$