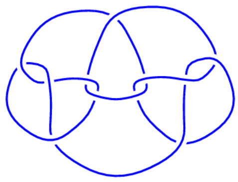
$11n_{22}$ $(K11n_{22})$



1

Arc Sequences

$\rightarrow \downarrow_{4} \rightarrow \downarrow_{1} \rightarrow \downarrow_{6} \rightarrow \downarrow_{2} \rightarrow \uparrow_{9} \rightarrow \downarrow_{4} \rightarrow \uparrow_{5} \rightarrow \downarrow_{11} \rightarrow \uparrow_{6} \rightarrow \downarrow_{8} \rightarrow \downarrow_{10} \rightarrow$

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle b^6 + 4b^4 + b^3 + 4b^2 + 1,\ u - 1,\ 2b^5 - 2b^4 + 7b^3 - 5b^2 + b + 3a - 4\rangle$$

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

$$\begin{aligned} I_3^u = \langle & u^{36} + 8u^{35} + \cdots + 6u + 1, \\ & - 3828372630208u^{35} - 28491852915687u^{34} + \cdots + 10929393607784b - 7902554413735, \\ & - 15232377764315u^{35} - 114270384255025u^{34} + \cdots + 2185878721568a - 27208961610835\rangle \end{aligned}$$

There are 3 irreducible components with 45 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. $\boldsymbol{I_1^u = \langle b^6 + 4b^4 + b^3 + 4b^2 + 1,\ u - 1,\ 2b^5 - 2b^4 + 7b^3 - 5b^2 + b + 3a - 4\rangle}$

(i) Arc colorings

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

(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
$u = 1.00000$ $a = -1.073950 - 0.558752I$ $b = -0.341164 - 0.940004I$	$-1.64493 + 5.69302I$	$-8.89162 - 3.92918I$
$u = 1.00000$ $a = -1.073950 + 0.558752I$ $b = -0.341164 + 0.940004I$	$-1.64493 - 5.69302I$	$-8.89162 + 3.92918I$
$u = 1.00000$ $a = 1.002193 - 0.295542I$ $b = 0.084211 - 0.566250I$	$0.245672 - 0.924305I$	$-3.44826 + 0.47256I$
$u = 1.00000$ $a = 1.002193 + 0.295542I$ $b = 0.084211 + 0.566250I$	$0.245672 + 0.924305I$	$-3.44826 - 0.47256I$
$u = 1.00000$ $a = -0.428243 - 0.664531I$ $b = 0.25695 - 1.72779I$	$-3.53554 - 0.92430I$	$-13.66012 + 2.42665I$
$u = 1.00000$ $a = -0.428243 + 0.664531I$ $b = 0.25695 + 1.72779I$	$-3.53554 + 0.92430I$	$-13.66012 - 2.42665I$

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

(i) Arc colorings

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

(ii) Obstruction class $= -1$

(iii) Cusp Shapes =unknown

(iv) Complex Volumes and Cusp Shapes

Solution to I^u_2	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.877439 - 0.744862I$ $a = 0$ $b = -0.337641 - 0.562280I$	$1.37919 - 2.82812I$	$-9.19557 + 4.65175I$
$u = -0.877439 + 0.744862I$ $a = 0$ $b = -0.337641 + 0.562280I$	$1.37919 + 2.82812I$	$-9.19557 - 4.65175I$
$u = 0.754878$ $a = 0$ $b = -2.32472$	-2.75839	-22.6089

III. $\boldsymbol{I^u_3 =}$
$\boldsymbol{\langle u^{36}+8u^{35}+\cdots+6u+1,\ -3.83\times10^{12}u^{35}-2.85\times10^{13}u^{34}+\cdots+1.09\times10^{12}b-7.90\times10^{12},\ -1.52\times10^{13}u^{35}-1.14\times10^{14}u^{34}+\cdots+2.19\times10^{12}a-2.72\times10^{13}\rangle}$

(i) Arc colorings

$$a_5 = \begin{pmatrix}0\\u\end{pmatrix}$$
$$a_9 = \begin{pmatrix}6.96854u^{35}+52.2766u^{34}+\cdots+58.0711u+12.4476\\3.50282u^{35}+26.0690u^{34}+\cdots+26.3899u+7.23055\end{pmatrix}$$
$$a_6 = \begin{pmatrix}7.18202u^{35}+55.7152u^{34}+\cdots+74.4097u+20.8306\\1.32891u^{35}+11.4430u^{34}+\cdots+19.8322u+6.22706\end{pmatrix}$$
$$a_2 = \begin{pmatrix}1\\0\end{pmatrix}$$
$$a_{10} = \begin{pmatrix}3.21641u^{35}+23.8555u^{34}+\cdots+26.5948u+1.11119\\2.04429u^{35}+15.4730u^{34}+\cdots+17.5570u+4.16398\end{pmatrix}$$
$$a_4 = \begin{pmatrix}u\\u\end{pmatrix}$$
$$a_7 = \begin{pmatrix}8.77976u^{35}+67.3114u^{34}+\cdots+83.8728u+23.3833\\2.92665u^{35}+23.0393u^{34}+\cdots+29.2953u+8.77976\end{pmatrix}$$
$$a_8 = \begin{pmatrix}8.77976u^{35}+67.3114u^{34}+\cdots+83.8728u+23.3833\\2.55270u^{35}+18.8239u^{34}+\cdots+20.5152u+5.85311\end{pmatrix}$$
$$a_1 = \begin{pmatrix}-u^2+1\\-u^2\end{pmatrix}$$
$$a_3 = \begin{pmatrix}u^4-u^2+1\\u^4\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}9.34439u^{35}+70.4826u^{34}+\cdots+83.6617u+19.5947\\3.50138u^{35}+25.8877u^{34}+\cdots+27.5892u+7.89526\end{pmatrix}$$
$$a_{11} = \begin{pmatrix}9.34439u^{35}+70.4826u^{34}+\cdots+83.6617u+19.5947\\3.50138u^{35}+25.8877u^{34}+\cdots+27.5892u+7.89526\end{pmatrix}$$

(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
$u = -1.17133 - 0.91175I$ $a = \ \ 0.434428 - 0.937485I$ $b = -0.37563 - 2.49619I$	$8.7659 - 13.1890I$	$-3.42405 + 7.32457I$
$u = -1.17133 + 0.91175I$ $a = \ \ 0.434428 + 0.937485I$ $b = -0.37563 + 2.49619I$	$8.7659 + 13.1890I$	$-3.42405 - 7.32457I$
$u = -1.12508 - 0.97464I$ $a = -0.526744 + 0.882080I$ $b = \ \ 0.47837 + 2.35320I$	$10.93881 - 6.87915I$	$-0.93565 + 3.18853I$
$u = -1.12508 + 0.97464I$ $a = -0.526744 - 0.882080I$ $b = \ \ 0.47837 - 2.35320I$	$10.93881 + 6.87915I$	$-0.93565 - 3.18853I$
$u = -1.040320 - 0.944822I$ $a = \ \ 0.750036 + 0.509376I$ $b = \ \ 0.562334 + 0.491262I$	$5.37775 - 6.26456I$	$-3.90154 + 4.74503I$
$u = -1.040320 + 0.944822I$ $a = \ \ 0.750036 - 0.509376I$ $b = \ \ 0.562334 - 0.491262I$	$5.37775 + 6.26456I$	$-3.90154 - 4.74503I$
$u = -0.973276 - 0.948498I$ $a = \ \ 0.551391 - 0.646107I$ $b = -1.01164 - 2.25516I$	$3.87982 - 3.49544I$	$-3.17810 + 2.67745I$
$u = -0.973276 + 0.948498I$ $a = \ \ 0.551391 + 0.646107I$ $b = -1.01164 + 2.25516I$	$3.87982 + 3.49544I$	$-3.17810 - 2.67745I$
$u = -0.919988 - 1.004771I$ $a = -0.612484 - 0.674551I$ $b = -0.415934 - 0.622427I$	$5.76584 - 0.88624I$	$-3.08966 - 0.19737I$
$u = -0.919988 + 1.004771I$ $a = -0.612484 + 0.674551I$ $b = -0.415934 + 0.622427I$	$5.76584 + 0.88624I$	$-3.08966 + 0.19737I$

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.89682-1.12852I$ $a=-0.833393+0.682950I$ $b=\ \ 0.65291+1.63006I$	$11.70845-0.74205I$	$-0.18071+1.41776I$
$u=-0.89682+1.12852I$ $a=-0.833393-0.682950I$ $b=\ \ 0.65291-1.63006I$	$11.70845+0.74205I$	$-0.18071-1.41776I$
$u=-0.895986-0.665316I$ $a=\ \ 0.473835-0.275485I$ $b=\ \ 0.382052-0.175717I$	$1.96162-2.57896I$	$2.96196+0.32171I$
$u=-0.895986+0.665316I$ $a=\ \ 0.473835+0.275485I$ $b=\ \ 0.382052+0.175717I$	$1.96162+2.57896I$	$2.96196-0.32171I$
$u=-0.790568-1.152679I$ $a=\ \ 0.937524-0.605731I$ $b=-0.63788-1.32894I$	$10.03078+5.72886I$	$-1.83889-3.03607I$
$u=-0.790568+1.152679I$ $a=\ \ 0.937524+0.605731I$ $b=-0.63788+1.32894I$	$10.03078-5.72886I$	$-1.83889+3.03607I$
$u=-0.666828-0.220770I$ $a=-1.10072+1.25962I$ $b=-0.586016+0.886227I$	$-0.90609-6.15586I$	$-1.06826+8.23147I$
$u=-0.666828+0.220770I$ $a=-1.10072-1.25962I$ $b=-0.586016-0.886227I$	$-0.90609+6.15586I$	$-1.06826-8.23147I$
$u=-0.458159-0.388133I$ $a=\ \ 0.61056-1.53826I$ $b=\ \ 0.442370-0.798720I$	$1.44120-1.68807I$	$1.23787+2.98942I$
$u=-0.458159+0.388133I$ $a=\ \ 0.61056+1.53826I$ $b=\ \ 0.442370+0.798720I$	$1.44120+1.68807I$	$1.23787-2.98942I$

Solution to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.364530 - 0.110500I$ $a = -1.95580 - 1.35882I$ $b = -0.119442 - 0.828689I$	$-2.24151 - 1.11055I$	$-4.16932 + 0.85691I$
$u = -0.364530 + 0.110500I$ $a = -1.95580 + 1.35882I$ $b = -0.119442 + 0.828689I$	$-2.24151 + 1.11055I$	$-4.16932 - 0.85691I$
$u = 0.272152 - 0.810511I$ $a = -0.39060 - 1.45115I$ $b = 0.60877 - 1.40001I$	$3.60869 + 0.40430I$	$-0.180320 - 0.512361I$
$u = 0.272152 + 0.810511I$ $a = -0.39060 + 1.45115I$ $b = 0.60877 + 1.40001I$	$3.60869 - 0.40430I$	$-0.180320 + 0.512361I$
$u = 0.363392 - 0.400261I$ $a = 1.25440 - 0.80904I$ $b = 0.028469 + 0.438989I$	$-1.17315 + 1.43837I$	$-4.87286 - 4.95965I$
$u = 0.363392 + 0.400261I$ $a = 1.25440 + 0.80904I$ $b = 0.028469 - 0.438989I$	$-1.17315 - 1.43837I$	$-4.87286 + 4.95965I$
$u = 0.467103$ $a = 1.13295$ $b = -2.19440$	-2.39731	2.58443
$u = 0.510437 - 0.832243I$ $a = 0.323851 + 1.364074I$ $b = -0.69543 + 1.63364I$	$2.60051 + 6.07581I$	$-2.58564 - 6.03076I$
$u = 0.510437 + 0.832243I$ $a = 0.323851 - 1.364074I$ $b = -0.69543 - 1.63364I$	$2.60051 - 6.07581I$	$-2.58564 + 6.03076I$
$u = 0.825866$ $a = 0.317728$ $b = -0.465023$	-1.19842	-8.63077

Solution to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.060052 - 0.082275I$ $a = -0.228566 + 0.473480I$ $b = 0.05805 + 2.76960I$	$-3.21515 + 0.53565I$	$-7.7422 + 12.1700I$
$u = 1.060052 + 0.082275I$ $a = -0.228566 - 0.473480I$ $b = 0.05805 - 2.76960I$	$-3.21515 - 0.53565I$	$-7.7422 - 12.1700I$
$u = 1.156679 - 0.402174I$ $a = 0.924656 + 0.203302I$ $b = 0.192811 + 1.126819I$	$0.196716 - 1.191216I$	$-3.75367 + 2.76129I$
$u = 1.156679 + 0.402174I$ $a = 0.924656 - 0.203302I$ $b = 0.192811 - 1.126819I$	$0.196716 + 1.191216I$	$-3.75367 - 2.76129I$
$u = 1.293685 - 0.259633I$ $a = -0.837715 - 0.404553I$ $b = -0.23443 - 1.43958I$	$-0.19217 + 3.89522I$	$-3.75583 - 3.33691I$
$u = 1.293685 + 0.259633I$ $a = -0.837715 + 0.404553I$ $b = -0.23443 + 1.43958I$	$-0.19217 - 3.89522I$	$-3.75583 + 3.33691I$

IV. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u-1)^6(u^3+u^2-1)(u^{36}+8u^{35}+\cdots+6u+1)$
c_2	$(u+1)^6(u^3+u^2+2u+1)(u^{36}+8u^{35}+\cdots+22u+1)$
c_3, c_6	$u^6(u^3-u^2+2u-1)(u^{36}+2u^{35}+\cdots-384u^2-64)$
c_4	$(u+1)^6(u^3+u^2-1)(u^{36}+8u^{35}+\cdots+6u+1)$
c_5	$u^3(u^6-u^5+\cdots-u+1)(u^{36}+2u^{35}+\cdots-4u+8)$
c_7	$(u^3-3u^2+2u+1)(u^6-3u^5+5u^4-4u^3+2u^2-u+1)$ $(u^{36}+3u^{35}+\cdots-u-1)$
c_8	$(u+1)^3(u^6+u^5+\cdots+u+1)(u^{36}+5u^{35}+\cdots-18u-1)$
c_9	$u^3(u^6+u^5+\cdots+u+1)(u^{36}+2u^{35}+\cdots-4u+8)$
c_{10}	$(u+1)^3(u^6-u^5+\cdots-u+1)(u^{36}+5u^{35}+\cdots-18u-1)$
c_{11}	$(u+1)^3(u^6+3u^5+5u^4+4u^3+2u^2+u+1)$ $(u^{36}+15u^{35}+\cdots+218u+1)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_4	$(y-1)^6(y^3-y^2+2y-1)(y^{36}-8y^{35}+\cdots-22y+1)$
c_2	$(y-1)^6(y^3+3y^2+2y-1)(y^{36}+48y^{35}+\cdots-22y+1)$
c_3, c_6	$y^6(y^3+3y^2+2y-1)(y^{36}+42y^{35}+\cdots+49152y+4096)$
c_5, c_9	$y^3(y^6-3y^5+\cdots-y+1)(y^{36}-24y^{35}+\cdots-1488y+64)$
c_7	$(y^3-5y^2+10y-1)(y^6+y^5+5y^4+6y^2+3y+1)$ $(y^{36}-45y^{35}+\cdots-5y+1)$
c_8, c_{10}	$(y-1)^3(y^6-3y^5+5y^4-4y^3+2y^2-y+1)$ $(y^{36}-15y^{35}+\cdots-218y+1)$
c_{11}	$(y-1)^3(y^6+y^5+\cdots+3y+1)(y^{36}+17y^{35}+\cdots-43646y+1)$