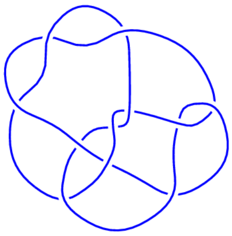
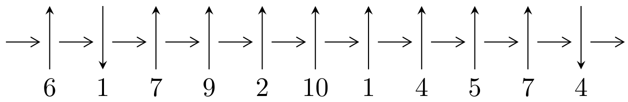
$11n_{109}$ ($K11n_{109}$)



[1]

Arc Sequences



Solving Sequence

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

Representation Ideals

$$I = \bigcap_{i=1}^{2} I_i^u$$

$$\begin{aligned}
I_1^u = \langle & u^{10} - u^9 + 4u^8 - 3u^7 + 7u^6 - 4u^5 + 7u^4 - 4u^3 + 4u^2 - u + 1, \\
& - u^9 - 3u^7 - u^6 - 4u^5 - 3u^4 - 3u^3 - 3u^2 + a - 2, \\
& 2u^9 - 2u^8 + 7u^7 - 5u^6 + 10u^5 - 5u^4 + 8u^3 - 4u^2 + b + 3u + 1 \rangle \\
I_2^u = \langle & u^{38} + 2u^{37} + \cdots + 3u + 1,\ 2.63625 \times 10^{25} u^{37} + 2.28783 \times 10^{25} u^{36} + \cdots + 3.48267 \times 10^{25} a + 2.14600 \times 10^{25} \\
& - 2.20003 \times 10^{25} u^{37} - 4.95447 \times 10^{25} u^{36} + \cdots + 3.48267 \times 10^{25} b - 2.88601 \times 10^{25} \rangle
\end{aligned}$$

There are 2 irreducible components with 48 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.

$$\boldsymbol{I_1^u = \langle u^{10} - u^9 + \cdots - u + 1,\ -u^9 - 3u^7 + \cdots + a - 2,\ 2u^9 - 2u^8 + \cdots + b + 1\rangle}$$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^9 + 3u^7 + u^6 + 4u^5 + 3u^4 + 3u^3 + 3u^2 + 2 \\ -2u^9 + 2u^8 - 7u^7 + 5u^6 - 10u^5 + 5u^4 - 8u^3 + 4u^2 - 3u - 1 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^9 - 2u^8 + 4u^7 - 6u^6 + 6u^5 - 8u^4 + 4u^3 - 7u^2 + 2u - 1 \\ -u^9 + 2u^8 - 5u^7 + 6u^6 - 9u^5 + 8u^4 - 8u^3 + 7u^2 - 4u + 2 \end{pmatrix}$$

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

$$a_{11} = \begin{pmatrix} u^9 + 2u^7 + u^6 + u^5 + 2u^4 - u^3 + u^2 - 3u + 2 \\ -3u^9 + 2u^8 - 10u^7 + 4u^6 - 14u^5 + 3u^4 - 11u^3 + 4u^2 - 3u - 2 \end{pmatrix}$$

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

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

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

$$a_9 = \begin{pmatrix} u^8 - u^7 + 4u^6 - 2u^5 + 7u^4 - 2u^3 + 7u^2 - 2u + 3 \\ -u^9 + u^8 - 3u^7 + 2u^6 - 4u^5 + u^4 - 3u^3 - u - 2 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} u^7 + 3u^5 + 4u^3 + u^2 + 3u \\ 2u^9 - u^8 + 6u^7 - 2u^6 + 8u^5 - u^4 + 6u^3 - 2u^2 + u + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^9 - u^8 + 3u^7 - 3u^6 + 4u^5 - 4u^4 + 2u^3 - 4u^2 \\ -u^9 + u^8 - 4u^7 + 3u^6 - 7u^5 + 4u^4 - 6u^3 + 4u^2 - 3u + 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u^9 - u^8 + 3u^7 - 3u^6 + 4u^5 - 4u^4 + 2u^3 - 4u^2 \\ -u^9 + u^8 - 4u^7 + 3u^6 - 7u^5 + 4u^4 - 6u^3 + 4u^2 - 3u + 1 \end{pmatrix}$$

(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
$u = -0.591573 - 0.895458I$ $a = -0.659378 + 0.798595I$ $b = 0.857907 - 0.485807I$	$1.88316 + 2.32533I$	$12.32535 - 3.44072I$
$u = -0.591573 + 0.895458I$ $a = -0.659378 - 0.798595I$ $b = 0.857907 + 0.485807I$	$1.88316 - 2.32533I$	$12.32535 + 3.44072I$
$u = -0.079307 - 0.642927I$ $a = 1.31154 + 0.57908I$ $b = -2.19685 + 0.82100I$	$-2.77192 + 1.74853I$	$1.51113 - 2.06464I$
$u = -0.079307 + 0.642927I$ $a = 1.31154 - 0.57908I$ $b = -2.19685 - 0.82100I$	$-2.77192 - 1.74853I$	$1.51113 + 2.06464I$
$u = -0.059179 - 1.329344I$ $a = -0.437472 + 0.050184I$ $b = 0.252670 - 0.807564I$	$-5.58838 - 1.13850I$	$4.94587 - 0.33361I$
$u = -0.059179 + 1.329344I$ $a = -0.437472 - 0.050184I$ $b = 0.252670 + 0.807564I$	$-5.58838 + 1.13850I$	$4.94587 + 0.33361I$
$u = 0.587969 - 0.580983I$ $a = -1.01749 - 1.46349I$ $b = -0.258029 + 0.056971I$	$8.26505 - 0.63915I$	$14.5970 + 5.3987I$
$u = 0.587969 + 0.580983I$ $a = -1.01749 + 1.46349I$ $b = -0.258029 - 0.056971I$	$8.26505 + 0.63915I$	$14.5970 - 5.3987I$
$u = 0.642090 - 1.139228I$ $a = -0.697194 - 0.500245I$ $b = 1.34430 + 1.39077I$	$6.43677 - 4.34705I$	$13.62063 + 3.59101I$
$u = 0.642090 + 1.139228I$ $a = -0.697194 + 0.500245I$ $b = 1.34430 - 1.39077I$	$6.43677 + 4.34705I$	$13.62063 - 3.59101I$

II. $\boldsymbol{I_2^u =}$
$\boldsymbol{\langle u^{38}+2u^{37}+\cdots+3u+1,\ 2.64\times10^{25}u^{37}+2.29\times10^{25}u^{36}+\cdots+3.48\times10^{25}a+2.15\times10^{25},\ -2.20\times10^{25}u^{37}-4.95\times10^{25}u^{36}+\cdots+3.48\times10^{25}b-2.89\times10^{25}\rangle}$

(i) Arc colorings

$$a_6 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} -0.756963u^{37} - 0.656918u^{36} + \cdots + 0.582663u - 0.616194 \\ 0.631707u^{37} + 1.42261u^{36} + \cdots + 2.60943u + 0.828678 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -1.81988u^{37} - 3.09009u^{36} + \cdots - 4.84948u - 1.27598 \\ 1.84428u^{37} + 2.49676u^{36} + \cdots + 5.29511u + 0.631271 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -0.101427u^{37} + 0.518797u^{36} + \cdots + 0.997777u + 0.694773 \\ -0.719948u^{37} - 0.842438u^{36} + \cdots - 0.294641u + 0.0155744 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u^2 + 1 \\ u^4 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u \\ u \end{pmatrix}$$
$$a_9 = \begin{pmatrix} -0.0856053u^{37} + 0.615474u^{36} + \cdots + 3.50601u + 0.400009 \\ -0.0396514u^{37} + 0.150216u^{36} + \cdots - 0.313917u - 0.187524 \end{pmatrix}$$
$$a_4 = \begin{pmatrix} -0.442400u^{37} + 0.747467u^{36} + \cdots + 2.30248u + 1.92979 \\ -0.664711u^{37} - 1.67661u^{36} + \cdots - 3.97167u - 1.27334 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.613714u^{37} - 0.654017u^{36} + \cdots + 0.274755u - 0.0950486 \\ 1.06980u^{37} + 1.25852u^{36} + \cdots + 4.01771u + 0.607524 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} -0.613714u^{37} - 0.654017u^{36} + \cdots + 0.274755u - 0.0950486 \\ 1.06980u^{37} + 1.25852u^{36} + \cdots + 4.01771u + 0.607524 \end{pmatrix}$$

(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
$u = -1.081328 - 0.386328I$ $a = -0.867653 + 0.857446I$ $b = -0.206832 - 0.161047I$	$1.95602 - 6.72677I$	$10.60803 + 3.77299I$
$u = -1.081328 + 0.386328I$ $a = -0.867653 - 0.857446I$ $b = -0.206832 + 0.161047I$	$1.95602 + 6.72677I$	$10.60803 - 3.77299I$
$u = -0.698047 - 1.223377I$ $a = -1.030832 + 0.525008I$ $b = 1.83321 - 1.27479I$	$-0.64182 + 13.08695I$	$8.09856 - 7.03946I$
$u = -0.698047 + 1.223377I$ $a = -1.030832 - 0.525008I$ $b = 1.83321 + 1.27479I$	$-0.64182 - 13.08695I$	$8.09856 + 7.03946I$
$u = -0.693371$ $a = 2.22543$ $b = -0.225023$	7.32047	11.7759
$u = -0.668607 - 0.872893I$ $a = 0.572440 - 0.409656I$ $b = -0.912959 + 0.050023I$	$1.01360 + 2.58424I$	$2.68887 - 3.99949I$
$u = -0.668607 + 0.872893I$ $a = 0.572440 + 0.409656I$ $b = -0.912959 - 0.050023I$	$1.01360 - 2.58424I$	$2.68887 + 3.99949I$
$u = -0.534109 - 1.201299I$ $a = 0.673458 - 0.887023I$ $b = -1.21349 + 1.64286I$	$4.11680 + 4.64818I$	$8.30001 - 4.11714I$
$u = -0.534109 + 1.201299I$ $a = 0.673458 + 0.887023I$ $b = -1.21349 - 1.64286I$	$4.11680 - 4.64818I$	$8.30001 + 4.11714I$
$u = -0.496586 - 1.000335I$ $a = 0.91537 + 1.15790I$ $b = -1.72217 - 0.16503I$	$-3.05076 + 4.70281I$	$7.22690 - 4.71362I$

Solution to I_2^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.496586+1.000335I$ $a=\ \ 0.91537-1.15790I$ $b=-1.72217+0.16503I$	$-3.05076-4.70281I$	$7.22690+4.71362I$
$u=-0.447680-0.663750I$ $a=-1.43961-0.77935I$ $b=\ \ 2.07802-0.46283I$	$-1.90577-0.72497I$	$8.59505-1.33995I$
$u=-0.447680+0.663750I$ $a=-1.43961+0.77935I$ $b=\ \ 2.07802+0.46283I$	$-1.90577+0.72497I$	$8.59505+1.33995I$
$u=-0.437061-1.002291I$ $a=-0.812401+0.746887I$ $b=\ \ 1.011531+0.515601I$	$-3.43318+1.20443I$	$6.92259-2.66519I$
$u=-0.437061+1.002291I$ $a=-0.812401-0.746887I$ $b=\ \ 1.011531-0.515601I$	$-3.43318-1.20443I$	$6.92259+2.66519I$
$u=-0.326007-0.583311I$ $a=\ \ 0.117692+0.462876I$ $b=\ \ 1.34426-1.15183I$	$-2.08165+2.22554I$	$9.62442-6.36612I$
$u=-0.326007+0.583311I$ $a=\ \ 0.117692-0.462876I$ $b=\ \ 1.34426+1.15183I$	$-2.08165-2.22554I$	$9.62442+6.36612I$
$u=-0.284870$ $a=-1.40010$ $b=-0.198545$	0.644934	15.5787
$u=-0.19948-1.53203I$ $a=\ \ 0.152978+0.524099I$ $b=-0.205003-1.335942I$	$-4.80130-2.15880I$	$9.55926+4.13726I$
$u=-0.19948+1.53203I$ $a=\ \ 0.152978-0.524099I$ $b=-0.205003+1.335942I$	$-4.80130+2.15880I$	$9.55926-4.13726I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.198690 - 0.927706I$ $a = -0.639094 + 0.144480I$ $b = 1.268122 - 0.556517I$	$-1.65932 + 1.72508I$	$3.99615 - 5.00557I$
$u = -0.198690 + 0.927706I$ $a = -0.639094 - 0.144480I$ $b = 1.268122 + 0.556517I$	$-1.65932 - 1.72508I$	$3.99615 + 5.00557I$
$u = 0.297248 - 1.257894I$ $a = 0.663933 - 0.642369I$ $b = -1.199794 + 0.637937I$	$-8.06788 - 1.04561I$	$1.73854 + 0.76531I$
$u = 0.297248 + 1.257894I$ $a = 0.663933 + 0.642369I$ $b = -1.199794 - 0.637937I$	$-8.06788 + 1.04561I$	$1.73854 - 0.76531I$
$u = 0.337441 - 0.249883I$ $a = -2.42316 - 2.21260I$ $b = -0.635847 - 0.037727I$	$7.79085 - 0.03851I$	$8.05729 - 1.80582I$
$u = 0.337441 + 0.249883I$ $a = -2.42316 + 2.21260I$ $b = -0.635847 + 0.037727I$	$7.79085 + 0.03851I$	$8.05729 + 1.80582I$
$u = 0.379743 - 0.859856I$ $a = 0.773786 + 1.078396I$ $b = -1.190231 - 0.562474I$	$1.30138 - 1.64549I$	$4.54049 - 1.93386I$
$u = 0.379743 + 0.859856I$ $a = 0.773786 - 1.078396I$ $b = -1.190231 + 0.562474I$	$1.30138 + 1.64549I$	$4.54049 + 1.93386I$
$u = 0.526939 - 1.137219I$ $a = -0.696229 - 0.307990I$ $b = 1.33219 + 1.36680I$	$5.23331 - 4.18634I$	$5.68349 + 3.29449I$
$u = 0.526939 + 1.137219I$ $a = -0.696229 + 0.307990I$ $b = 1.33219 - 1.36680I$	$5.23331 + 4.18634I$	$5.68349 - 3.29449I$

Solution to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.561660 - 1.148651I$ $a = -0.937344 - 0.576864I$ $b = 1.79023 + 0.38453I$	$-6.14363 - 7.57123I$	$4.89087 + 5.76194I$
$u = 0.561660 + 1.148651I$ $a = -0.937344 + 0.576864I$ $b = 1.79023 - 0.38453I$	$-6.14363 + 7.57123I$	$4.89087 - 5.76194I$
$u = 0.775393 - 0.236076I$ $a = -0.707229 - 1.077228I$ $b = 0.640042 + 0.030719I$	$-3.53482 + 2.58667I$	$7.16756 - 2.58418I$
$u = 0.775393 + 0.236076I$ $a = -0.707229 + 1.077228I$ $b = 0.640042 - 0.030719I$	$-3.53482 - 2.58667I$	$7.16756 + 2.58418I$
$u = 0.784887 - 0.992111I$ $a = 0.907975 + 0.168508I$ $b = -1.69223 - 0.81013I$	$4.61276 - 5.70694I$	$9.04865 + 6.07255I$
$u = 0.784887 + 0.992111I$ $a = 0.907975 - 0.168508I$ $b = -1.69223 + 0.81013I$	$4.61276 + 5.70694I$	$9.04865 - 6.07255I$
$u = 0.913408 - 0.776527I$ $a = 0.363262 + 0.855243I$ $b = 0.392732 - 0.086905I$	$5.31271 - 0.53174I$	$10.57597 + 0.24868I$
$u = 0.913408 + 0.776527I$ $a = 0.363262 - 0.855243I$ $b = 0.392732 + 0.086905I$	$5.31271 + 0.53174I$	$10.57597 - 0.24868I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^{10} - u^9 + 4u^8 - 3u^7 + 7u^6 - 4u^5 + 7u^4 - 4u^3 + 4u^2 - u + 1)$ $(u^{38} + 2u^{37} + \cdots + 3u + 1)$
c_2	$(u^{10} + 7u^9 + \cdots + 7u + 1)(u^{38} + 20u^{37} + \cdots - 7u + 1)$
c_3	$(u^{10} + 2u^8 + u^7 - 4u^6 - 2u^5 - 2u^4 - 2u^3 + 8u^2 - 2u + 1)$ $(u^{38} + u^{37} + \cdots + 130u - 29)$
c_4	$(u^{10} - 6u^8 - u^7 + 13u^6 + 4u^5 - 12u^4 - 5u^3 + 4u^2 + 2u + 1)$ $(u^{38} + u^{37} + \cdots - 24u - 19)$
c_5	$(u^{10} + u^9 + 4u^8 + 3u^7 + 7u^6 + 4u^5 + 7u^4 + 4u^3 + 4u^2 + u + 1)$ $(u^{38} + 2u^{37} + \cdots + 3u + 1)$
c_6	$(u^{10} - 2u^9 - u^8 + 3u^7 + u^5 - 2u^4 - 2u^3 + 2u^2 + 1)$ $(u^{38} + 3u^{37} + \cdots - 94u - 11)$
c_7	$(u^{10} + 2u^8 - 2u^7 - 2u^6 + u^5 + 3u^3 - u^2 - 2u + 1)$ $(u^{38} + u^{37} + \cdots - 39u - 2)$
c_8, c_9	$(u^{10} - 6u^8 + u^7 + 13u^6 - 4u^5 - 12u^4 + 5u^3 + 4u^2 - 2u + 1)$ $(u^{38} + u^{37} + \cdots - 24u - 19)$
c_{10}	$(u^{10} + 2u^9 - u^8 - 3u^7 - u^5 - 2u^4 + 2u^3 + 2u^2 + 1)$ $(u^{38} + 3u^{37} + \cdots - 94u - 11)$
c_{11}	$(u^{10} - 3u^9 + u^8 + 5u^7 - 7u^6 + 3u^5 + 4u^4 - 7u^3 + 6u^2 - 3u + 1)$ $(u^{38} + 2u^{37} + \cdots - 31u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^{10}+7y^9+\cdots+7y+1)(y^{38}+20y^{37}+\cdots-7y+1)$
c_2	$(y^{10}-y^9+\cdots-5y+1)(y^{38}+4y^{37}+\cdots-95y+1)$
c_3	$(y^{10}+4y^9+\cdots+12y+1)(y^{38}+41y^{37}+\cdots+1138y+841)$
c_4, c_8, c_9	$(y^{10}-12y^9+\cdots+4y+1)(y^{38}-35y^{37}+\cdots-6y+361)$
c_6, c_{10}	$(y^{10}-6y^9+13y^8-9y^7-6y^6+9y^5+6y^4-12y^3+4y+1)$ $(y^{38}-17y^{37}+\cdots-1686y+121)$
c_7	$(y^{10}+4y^9-12y^7+6y^6+9y^5-6y^4-9y^3+13y^2-6y+1)$ $(y^{38}+37y^{37}+\cdots-325y+4)$
c_{11}	$(y^{10}-7y^9+17y^8-13y^7-3y^6+y^5+6y^4+3y^3+2y^2+3y+1)$ $(y^{38}-38y^{37}+\cdots-415y+1)$