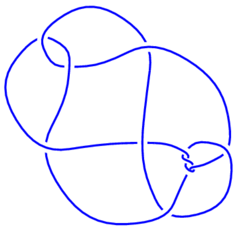
$11a_{121}$ $(K11a_{121})$



[1]

Arc Sequences

$$\rightarrow \underset{6}{\uparrow} \rightarrow \underset{1}{\downarrow} \rightarrow \underset{10}{\uparrow} \rightarrow \underset{8}{\uparrow} \rightarrow \underset{2}{\uparrow} \rightarrow \underset{5}{\downarrow} \rightarrow \underset{3}{\uparrow} \rightarrow \underset{11}{\downarrow} \rightarrow \underset{4}{\uparrow} \rightarrow \underset{9}{\downarrow} \rightarrow \underset{7}{\uparrow} \rightarrow$$

Solving Sequence

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

Representation Ideals

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

$$I_1^u = \langle u^{11} + 2u^9 + 4u^7 + 4u^5 - u^4 + 3u^3 - u^2 + 2u - 1 \rangle$$
$$I_2^u = \langle u^{48} - u^{47} + \cdots + 2u + 1 \rangle$$

There are 2 irreducible components with 59 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. $\boldsymbol{I_1^u = \langle u^{11} + 2u^9 + 4u^7 + 4u^5 - u^4 + 3u^3 - u^2 + 2u - 1 \rangle}$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -u \\ u^3 + u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} u^8 - u^7 + u^6 - 2u^5 + 2u^4 - 2u^3 + u^2 - 2u \\ -u^{10} - 2u^8 + u^7 - 3u^6 + u^5 - 3u^4 + 2u^3 - u^2 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^8 - u^6 - u^4 + 1 \\ u^{10} + 2u^8 + 3u^6 + 2u^4 + u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} u^{10} + u^9 + u^8 + 2u^7 + u^6 + 3u^5 + 2u^3 - u^2 + u \\ -u^9 + u^8 - u^7 + 2u^6 - 2u^5 + 2u^4 - u^3 + 2u^2 \end{pmatrix}$$

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

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

(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
$u=-0.817015-0.707633I$	$6.68078-3.13136I$	$8.76083+0.56604I$
$u=-0.817015+0.707633I$	$6.68078+3.13136I$	$8.76083-0.56604I$
$u=-0.617277-0.966546I$	$-0.07920+7.68222I$	$0.97285-8.49443I$
$u=-0.617277+0.966546I$	$-0.07920-7.68222I$	$0.97285+8.49443I$
$u=-0.111009-1.030814I$	$-5.93919+3.55367I$	$-6.35449-4.86751I$
$u=-0.111009+1.030814I$	$-5.93919-3.55367I$	$-6.35449+4.86751I$
$u=$ 0.444369	0.869046	11.7657
$u=\ 0.594105-0.723647I$	$1.48764-1.96750I$	$4.49213+3.23948I$
$u=\ 0.594105+0.723647I$	$1.48764+1.96750I$	$4.49213-3.23948I$
$u=\ 0.729012-1.011347I$	$4.8176-14.7555I$	$5.24582+10.31160I$
$u=\ 0.729012+1.011347I$	$4.8176+14.7555I$	$5.24582-10.31160I$

II. $I_2^u = \langle u^{48} - u^{47} + \cdots + 2u + 1 \rangle$

(i) Arc colorings

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

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

$$a_2 = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} -u \\ u^3+u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^3 \\ u^5+u^3+u \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -u^{21}-4u^{19}+\cdots-2u^3-u \\ u^{21}+3u^{19}+7u^{17}+10u^{15}+10u^{13}+7u^{11}+u^9-2u^7-3u^5-u^3+u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^8-u^6-u^4+1 \\ u^{10}+2u^8+3u^6+2u^4+u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -u^{27}-4u^{25}+\cdots+10u^5+3u^3 \\ u^{29}+5u^{27}+\cdots-u^3+u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{46}-7u^{44}+\cdots-4u^4+1 \\ u^{47}+7u^{45}+\cdots-2u-1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{46}-7u^{44}+\cdots-4u^4+1 \\ u^{47}+7u^{45}+\cdots-2u-1 \end{pmatrix}$$

(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
$u = -0.798379 - 0.782289I$	7.98533	10.0430
$u = -0.798379 + 0.782289I$	7.98533	10.0430
$u = -0.779513 - 0.728650I$	$3.78730 - 1.05884I$	$9.33375 + 1.03697I$
$u = -0.779513 + 0.728650I$	$3.78730 + 1.05884I$	$9.33375 - 1.03697I$
$u = -0.748039 - 0.955471I$	$7.45278 + 5.81585I$	$8.97012 - 5.48927I$
$u = -0.748039 + 0.955471I$	$7.45278 - 5.81585I$	$8.97012 + 5.48927I$
$u = -0.730704 - 1.006044I$	$5.77023 + 8.94227I$	$7.03302 - 5.48937I$
$u = -0.730704 + 1.006044I$	$5.77023 - 8.94227I$	$7.03302 + 5.48937I$
$u = -0.718495 - 0.983429I$	$3.01107 + 6.72706I$	$7.45449 - 6.34172I$
$u = -0.718495 + 0.983429I$	$3.01107 - 6.72706I$	$7.45449 + 6.34172I$
$u = -0.619099 - 0.144052I$	$3.01107 + 6.72706I$	$7.45449 - 6.34172I$
$u = -0.619099 + 0.144052I$	$3.01107 - 6.72706I$	$7.45449 + 6.34172I$
$u = -0.559504 - 0.928720I$	$-3.47428 + 2.08425I$	$-3.81787 - 2.59078I$
$u = -0.559504 + 0.928720I$	$-3.47428 - 2.08425I$	$-3.81787 + 2.59078I$
$u = -0.520871 - 0.529700I$	$0.94545 - 3.01303I$	$3.90717 + 2.47987I$
$u = -0.520871 + 0.529700I$	$0.94545 + 3.01303I$	$3.90717 - 2.47987I$
$u = -0.516429 - 0.228211I$	$-2.07060 + 1.71275I$	$0.95839 - 4.38827I$
$u = -0.516429 + 0.228211I$	$-2.07060 - 1.71275I$	$0.95839 + 4.38827I$
$u = -0.447030 - 0.894068I$	$0.85406 - 3.28062I$	$1.88284 + 1.76353I$
$u = -0.447030 + 0.894068I$	$0.85406 + 3.28062I$	$1.88284 - 1.76353I$
$u = -0.156596 - 1.043695I$	$-0.78809 + 9.12338I$	$-0.18249 - 8.13527I$
$u = -0.156596 + 1.043695I$	$-0.78809 - 9.12338I$	$-0.18249 + 8.13527I$
$u = -0.037970 - 1.018318I$	$-3.47428 - 2.08425I$	$-3.81787 + 2.59078I$
$u = -0.037970 + 1.018318I$	$-3.47428 + 2.08425I$	$-3.81787 - 2.59078I$
$u = 0.103335 - 0.964930I$	$-2.07060 - 1.71275I$	$0.95839 + 4.38827I$
$u = 0.103335 + 0.964930I$	$-2.07060 + 1.71275I$	$0.95839 - 4.38827I$
$u = 0.161802 - 1.028075I$	$0.15229 - 3.45771I$	$1.61918 + 3.33537I$
$u = 0.161802 + 1.028075I$	$0.15229 + 3.45771I$	$1.61918 - 3.33537I$
$u = 0.357761 - 0.828361I$	$1.54659 - 2.07802I$	$3.74247 + 4.14356I$
$u = 0.357761 + 0.828361I$	$1.54659 + 2.07802I$	$3.74247 - 4.14356I$

	Solution to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	$0.605322 - 0.114770I$	$3.78730 - 1.05884I$	$9.33375 + 1.03697I$
$u =$	$0.605322 + 0.114770I$	$3.78730 + 1.05884I$	$9.33375 - 1.03697I$
$u =$	$0.644764 - 0.924836I$	$0.94545 - 3.01303I$	$3.90717 + 2.47987I$
$u =$	$0.644764 + 0.924836I$	$0.94545 + 3.01303I$	$3.90717 - 2.47987I$
$u =$	$0.684868 - 0.970999I$	$0.85406 - 3.28062I$	$1.88284 + 1.76353I$
$u =$	$0.684868 + 0.970999I$	$0.85406 + 3.28062I$	$1.88284 - 1.76353I$
$u =$	$0.709249 - 0.753994I$	$1.54659 - 2.07802I$	$3.74247 + 4.14356I$
$u =$	$0.709249 + 0.753994I$	$1.54659 + 2.07802I$	$3.74247 - 4.14356I$
$u =$	$0.712082 - 1.003136I$	$-0.78809 - 9.12338I$	$-0.18249 + 8.13527I$
$u =$	$0.712082 + 1.003136I$	$-0.78809 + 9.12338I$	$-0.18249 - 8.13527I$
$u =$	$0.750786 - 0.945298I$	6.98909	8.15485
$u =$	$0.750786 + 0.945298I$	6.98909	8.15485
$u =$	$0.786969 - 0.691947I$	$0.15229 + 3.45771I$	$1.61918 - 3.33537I$
$u =$	$0.786969 + 0.691947I$	$0.15229 - 3.45771I$	$1.61918 + 3.33537I$
$u =$	$0.795531 - 0.794799I$	$7.45278 - 5.81585I$	$8.97012 + 5.48927I$
$u =$	$0.795531 + 0.794799I$	$7.45278 + 5.81585I$	$8.97012 - 5.48927I$
$u =$	$0.820160 - 0.698926I$	$5.77023 + 8.94227I$	$7.03302 - 5.48937I$
$u =$	$0.820160 + 0.698926I$	$5.77023 - 8.94227I$	$7.03302 + 5.48937I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1, c_3, c_5 c_9	$(u^{11} + 2u^9 + \cdots + 2u + 1)(u^{48} + u^{47} + \cdots - 2u + 1)$
c_2, c_6, c_8	$(u^{11} + 4u^{10} + \cdots + 2u - 1)(u^{48} + 15u^{47} + \cdots + 8u^3 + 1)$
c_4, c_{11}	$(u^{11} + 2u^9 - 2u^8 + 10u^7 + 12u^5 - 3u^4 + 5u^3 - u^2 - 1)$ $(u^{48} + 5u^{47} + \cdots + 12u + 1)$
c_7	$(u^{11} + 7u^{10} + \cdots + 28u + 8)$ $(7 - 18u + 8u^2 + 22u^3 - 29u^4 + 18u^5 - 27u^6 + 9u^7 + 40u^8 - 18u^9 - 38u^{10} - 4u^{11} + 52u^{12} +$
c_{10}	$(u + 1)(u^{11} + 4u^{10} + \cdots + 2u - 1)(u^{47} + 14u^{46} + \cdots - u + 1)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_3, c_5 c_9	$(y^{11}+4y^{10}+\cdots+2y-1)(y^{48}+15y^{47}+\cdots+8y^3+1)$
c_2, c_6, c_8	$(y^{11}+8y^{10}+\cdots+22y-1)(y^{48}+35y^{47}+\cdots+88y^2+1)$
c_4, c_{11}	$(y^{11}+4y^{10}+\cdots-2y-1)(y^{48}-5y^{47}+\cdots-24y+1)$
c_7	$(y^{11}-3y^{10}+\cdots+48y-64)$ $(49-212y+450y^2-678y^3+501y^4+306y^5-1147y^6+1387y^7-74y^8-2840y^9+5468y^{10}$
c_{10}	$(y^{11}+8y^{10}+\cdots+22y-1)(y^{48}+35y^{47}+\cdots+88y^2+1)$