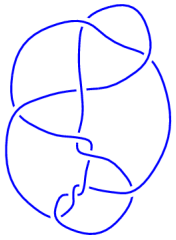
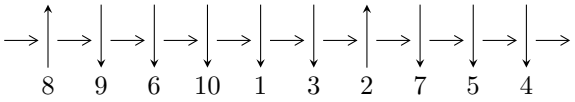
## $10_{30}$ $(K10a_{34})$



[1]

**Arc Sequences**




**Solving Sequence**

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

**Representation Ideals**

$$I = I_1^u$$

$$I_1^u = \langle u^{33} - u^{32} + \cdots - u + 1 \rangle$$

There are 1 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. $I_1^u = \langle u^{33} - u^{32} + \cdots - u + 1 \rangle$

**(i) Arc colorings**

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

$$a_8 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

$$a_9 = \begin{pmatrix} -u^3 \\ u^5 + u^3 + u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} -u^6 - u^4 + 1 \\ u^8 + 2u^6 + 2u^4 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -u^{11} - 2u^9 - 2u^7 + u^3 \\ u^{13} + 3u^{11} + 5u^9 + 4u^7 + 2u^5 + u^3 + u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{16} - 3u^{14} - 5u^{12} - 4u^{10} - u^8 + 1 \\ u^{18} + 4u^{16} + 9u^{14} + 12u^{12} + 11u^{10} + 8u^8 + 6u^6 + 4u^4 + u^2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u^{13} + 2u^{11} + 3u^9 + 2u^7 + 2u^5 + 2u^3 + u \\ u^{13} + 3u^{11} + 5u^9 + 4u^7 + 2u^5 + u^3 + u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -u^{31} - 6u^{29} + \cdots - 6u^5 - 2u^3 \\ -u^{31} - 7u^{29} + \cdots - 4u^5 + u \end{pmatrix}$$

**(ii) Obstruction class** $= -1$

**(iii) Cusp Shapes**

$= -4u^{32} + 4u^{31} - 28u^{30} + 24u^{29} - 104u^{28} + 84u^{27} - 256u^{26} + 200u^{25} - 460u^{24} + 364u^{23} - 644u^{22} + 532u^{21} - 744u^{20} + 652u^{19} - 756u^{18} + 688u^{17} - 696u^{16} + 632u^{15} - 572u^{14} + 512u^{13} - 404u^{12} + 364u^{11} - 248u^{10} + 228u^9 - 140u^8 + 120u^7 - 68u^6 + 52u^5 - 24u^4 + 20u^3 - 4u^2 - 2$

**(iv) Complex Volumes and Cusp Shapes**

| Solution to $I_1^u$ | $\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$ | Cusp shape |
|---|---|---|
| $u=-0.756564-0.531512I$ | $9.92249+3.59396I$ | $1.77642-3.03909I$ |
| $u=-0.756564+0.531512I$ | $9.92249-3.59396I$ | $1.77642+3.03909I$ |
| $u=-0.750033-0.440215I$ | $3.38108-3.30675I$ | $-2.44424+3.71770I$ |
| $u=-0.750033+0.440215I$ | $3.38108+3.30675I$ | $-2.44424-3.71770I$ |
| $u=-0.622996-1.042518I$ | $8.40124+1.63491I$ | $-0.45903-2.05852I$ |
| $u=-0.622996+1.042518I$ | $8.40124-1.63491I$ | $-0.45903+2.05852I$ |
| $u=-0.595580-1.086540I$ | $1.46905+8.41845I$ | $-5.65597-8.08731I$ |
| $u=-0.595580+1.086540I$ | $1.46905-8.41845I$ | $-5.65597+8.08731I$ |
| $u=-0.539171-0.794585I$ | $4.95997+2.19825I$ | $0.55384-3.61625I$ |
| $u=-0.539171+0.794585I$ | $4.95997-2.19825I$ | $0.55384+3.61625I$ |
| $u=-0.471931$ | $-1.00604$ | $-9.72742$ |
| $u=-0.429591-1.067312I$ | $-3.60742+3.47782I$ | $-12.61515-4.95314I$ |
| $u=-0.429591+1.067312I$ | $-3.60742-3.47782I$ | $-12.61515+4.95314I$ |
| $u=-0.135018-1.027238I$ | $-1.43040-1.50384I$ | $-9.59059+3.60616I$ |
| $u=-0.135018+1.027238I$ | $-1.43040+1.50384I$ | $-9.59059-3.60616I$ |
| $u=0.096071-1.100995I$ | $4.19152+4.53523I$ | $-5.07914-3.09222I$ |
| $u=0.096071+1.100995I$ | $4.19152-4.53523I$ | $-5.07914+3.09222I$ |
| $u=0.326389-0.884213I$ | $-0.54661-1.45331I$ | $-5.02647+4.36257I$ |
| $u=0.326389+0.884213I$ | $-0.54661+1.45331I$ | $-5.02647-4.36257I$ |
| $u=0.345723-1.064989I$ | $-0.390154-0.572456I$ | $-8.31906+0.48605I$ |
| $u=0.345723+1.064989I$ | $-0.390154+0.572456I$ | $-8.31906-0.48605I$ |
| $u=0.481406-1.089807I$ | $0.50606-6.56196I$ | $-6.35976+7.19745I$ |
| $u=0.481406+1.089807I$ | $0.50606+6.56196I$ | $-6.35976-7.19745I$ |
| $u=0.593279-1.056962I$ | $1.99857-4.30723I$ | $-4.15179+2.03529I$ |
| $u=0.593279+1.056962I$ | $1.99857+4.30723I$ | $-4.15179-2.03529I$ |
| $u=0.601136-0.188022I$ | $2.96939+2.39560I$ | $-2.36922-3.31266I$ |
| $u=0.601136+0.188022I$ | $2.96939-2.39560I$ | $-2.36922+3.31266I$ |
| $u=0.609745-1.098974I$ | $7.42465-11.82876I$ | $-1.93037+7.75337I$ |
| $u=0.609745+1.098974I$ | $7.42465+11.82876I$ | $-1.93037-7.75337I$ |
| $u=0.722135-0.492648I$ | $3.67259-0.72831I$ | $-1.49015+3.12560I$ |
| $u=0.722135+0.492648I$ | $3.67259+0.72831I$ | $-1.49015-3.12560I$ |
| $u=0.789032-0.436494I$ | $9.39642+6.56751I$ | $1.02440-3.41838I$ |
| $u=0.789032+0.436494I$ | $9.39642-6.56751I$ | $1.02440+3.41838I$ |

**II. u-Polynomials**

| Crossings | u-Polynomials at each crossings |
|---|---|
| $c_1, c_7$ | $(u^{33}+u^{32}+\cdots-u-1)$ |
| $c_2$ | $(u^{33}+u^{32}+\cdots+u+1)$ |
| $c_3, c_6$ | $(u^{33}+5u^{32}+\cdots-31u-3)$ |
| $c_4, c_9, c_{10}$ | $(u^{33}+u^{32}+\cdots+3u+1)$ |
| $c_5$ | $(u^{33}+u^{32}+\cdots+61u-17)$ |
| $c_8$ | $(u^{33}+15u^{32}+\cdots+u-1)$ |

**III. Riley Polynomials**

| Crossings | Riley Polynomials at each crossings |
|---|---|
| $c_1, c_7$ | $(y^{33} + 15y^{32} + \cdots + y - 1)$ |
| $c_2$ | $(y^{33} - y^{32} + \cdots + 33y - 1)$ |
| $c_3, c_6$ | $(y^{33} + 27y^{32} + \cdots + y - 9)$ |
| $c_4, c_9, c_{10}$ | $(y^{33} + 31y^{32} + \cdots + y - 1)$ |
| $c_5$ | $(y^{33} + 11y^{32} + \cdots - 3011y - 289)$ |
| $c_8$ | $(y^{33} + 7y^{32} + \cdots + 17y - 1)$ |