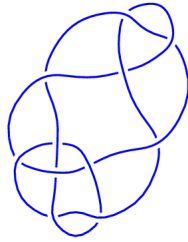
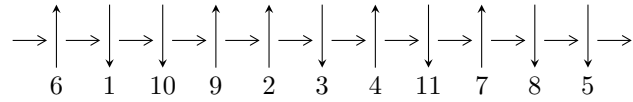


11a₈₁ (K11a₈₁)

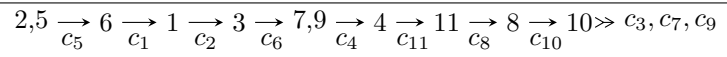


1

Arc Sequences



Solving Sequence



Representation Ideals

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

$$I_1^u = \langle u^2 + u + 1, b + u, a - 1 \rangle$$

$$I_2^u = \langle u^{65} - 2u^{64} + \dots + u + 1, -1.19217 \times 10^{21}u^{64} + 1.28632 \times 10^{21}u^{63} + \dots + 3.92161 \times 10^{20}a - 9.38507 \times 10^2 - 1.12437 \times 10^{21}u^{64} + 2.08104 \times 10^{21}u^{63} + \dots + 3.92161 \times 10^{20}b + 9.56908 \times 10^{20} \rangle$$

There are 2 irreducible components with 67 representations.

¹The knot diagram image is adapter from “C. Livingston and A. H. Moore, KnotInfo: Table of Knot Invariants, <http://www.indiana.edu/~knotinfo>”

$$\text{I. } I_1^u = \langle u^2 + u + 1, b + u, a - 1 \rangle$$

(i) Arc colorings

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

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

$$a_3 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u \\ u + 1 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ -u \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u \\ -1 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u \\ -u \end{pmatrix}$$

$$a_8 = \begin{pmatrix} u + 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u \end{pmatrix}$$

(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
$u = -0.500000 - 0.866025I$	$-1.64493 + 2.02988I$	$-3.00000 - 3.46410I$
$a = 1.00000$		
$b = 0.500000 + 0.866025I$		
$u = -0.500000 + 0.866025I$	$-1.64493 - 2.02988I$	$-3.00000 + 3.46410I$
$a = 1.00000$		
$b = 0.500000 - 0.866025I$		

$$\text{II. } J_2^u = \langle u^{65} - 2u^{64} + \dots + u + 1, -1.19 \times 10^{21}u^{64} + 1.29 \times 10^{21}u^{63} + \dots + 3.92 \times 10^{20}a - 9.39 \times 10^{20}, -1.12 \times 10^{21}u^{64} + 2.08 \times 10^{21}u^{63} + \dots + 3.92 \times 10^{20}b + 9.57 \times 10^{20} \rangle$$

(i) Arc colorings

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

$$a_5 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

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

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

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

$$a_7 = \begin{pmatrix} -u^7 - 2u^5 - 2u^3 \\ -u^7 - u^5 + u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 3.04000u^{64} - 3.28008u^{63} + \dots + 4.27119u + 2.39317 \\ 2.86712u^{64} - 5.30659u^{63} + \dots + 1.95308u - 2.44009 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -5.41183u^{64} + 10.2518u^{63} + \dots - 0.187153u + 4.72588 \\ -0.371835u^{64} + 4.36917u^{63} + \dots + 11.7089u + 4.79741 \end{pmatrix}$$

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

$$a_8 = \begin{pmatrix} 3.24000u^{64} - 3.47980u^{63} + \dots + 5.21094u + 1.57707 \\ 3.03387u^{64} - 5.47353u^{63} + \dots + 2.13727u - 2.43980 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 2.84000u^{64} - 2.88110u^{63} + \dots + 4.21647u + 2.50783 \\ 2.69775u^{64} - 4.93896u^{63} + \dots + 2.26672u - 2.24110 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 2.84000u^{64} - 2.88110u^{63} + \dots + 4.21647u + 2.50783 \\ 2.69775u^{64} - 4.93896u^{63} + \dots + 2.26672u - 2.24110 \end{pmatrix}$$

(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
$u = -0.895488 - 0.125785I$ $a = 0.471660 - 1.144842I$ $b = 0.376735 + 0.287159I$	$-7.23534 - 2.53854I$	$-7.87268 + 2.81634I$
$u = -0.895488 + 0.125785I$ $a = 0.471660 + 1.144842I$ $b = 0.376735 - 0.287159I$	$-7.23534 + 2.53854I$	$-7.87268 - 2.81634I$
$u = -0.792642$ $a = -4.50659$ $b = 0.401921$	-4.52444	15.6457
$u = -0.775998 - 0.055269I$ $a = 0.78184 + 1.25281I$ $b = -0.272202 - 0.513943I$	$-2.68758 - 0.98018I$	$-2.13142 - 1.09675I$
$u = -0.775998 + 0.055269I$ $a = 0.78184 - 1.25281I$ $b = -0.272202 + 0.513943I$	$-2.68758 + 0.98018I$	$-2.13142 + 1.09675I$
$u = -0.681051 - 0.492285I$ $a = -0.055199 - 1.411262I$ $b = 0.444176 - 0.382574I$	$-1.66713 - 5.95884I$	$-1.87973 + 5.22029I$
$u = -0.681051 + 0.492285I$ $a = -0.055199 + 1.411262I$ $b = 0.444176 + 0.382574I$	$-1.66713 + 5.95884I$	$-1.87973 - 5.22029I$
$u = -0.571139 - 0.977969I$ $a = -1.213615 + 0.140366I$ $b = -1.62844 - 0.58978I$	$-3.06278 + 10.75517I$	$-3.84780 - 9.80074I$
$u = -0.571139 + 0.977969I$ $a = -1.213615 - 0.140366I$ $b = -1.62844 + 0.58978I$	$-3.06278 - 10.75517I$	$-3.84780 + 9.80074I$
$u = -0.526288 - 1.234516I$ $a = -0.873939 + 0.185569I$ $b = -2.29059 - 0.00902I$	$-10.58887 + 7.68258I$	$-9.86968 - 6.20420I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.526288 + 1.234516I$ $a = -0.873939 - 0.185569I$ $b = -2.29059 + 0.00902I$	$-10.58887 - 7.68258I$	$-9.86968 + 6.20420I$
$u = -0.487308 - 0.547787I$ $a = -0.211960 + 1.272069I$ $b = -0.231211 - 0.350100I$	$1.87042 - 1.68269I$	$3.98101 + 2.38110I$
$u = -0.487308 + 0.547787I$ $a = -0.211960 - 1.272069I$ $b = -0.231211 + 0.350100I$	$1.87042 + 1.68269I$	$3.98101 - 2.38110I$
$u = -0.484262 - 0.914397I$ $a = 0.921884 - 0.333475I$ $b = 2.04011 + 0.02854I$	$0.85073 + 5.73380I$	$0.10369 - 9.30698I$
$u = -0.484262 + 0.914397I$ $a = 0.921884 + 0.333475I$ $b = 2.04011 - 0.02854I$	$0.85073 - 5.73380I$	$0.10369 + 9.30698I$
$u = -0.477979 - 1.199781I$ $a = 0.716881 + 0.641319I$ $b = 2.26994 + 1.41320I$	$-6.01852 + 5.55484I$	$-4.97164 - 2.03636I$
$u = -0.477979 + 1.199781I$ $a = 0.716881 - 0.641319I$ $b = 2.26994 - 1.41320I$	$-6.01852 - 5.55484I$	$-4.97164 + 2.03636I$
$u = -0.457248 - 1.211201I$ $a = 0.94032 - 2.63123I$ $b = 1.90067 - 5.72471I$	$-8.07040 + 4.48064I$	$9.41196 - 1.03498I$
$u = -0.457248 + 1.211201I$ $a = 0.94032 + 2.63123I$ $b = 1.90067 + 5.72471I$	$-8.07040 - 4.48064I$	$9.41196 + 1.03498I$
$u = -0.432502 - 1.204003I$ $a = -1.029901 + 0.236107I$ $b = -2.78335 + 1.12697I$	$-6.34559 + 3.27358I$	$-5.96586 - 5.01774I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.432502 + 1.204003I$ $a = -1.029901 - 0.236107I$ $b = -2.78335 - 1.12697I$	$-6.34559 - 3.27358I$	$-5.96586 + 5.01774I$
$u = -0.384245 - 1.272527I$ $a = 0.694634 + 0.601416I$ $b = 1.61318 + 0.48242I$	$-11.61322 + 1.86120I$	$-11.51231 - 1.02799I$
$u = -0.384245 + 1.272527I$ $a = 0.694634 - 0.601416I$ $b = 1.61318 - 0.48242I$	$-11.61322 - 1.86120I$	$-11.51231 + 1.02799I$
$u = -0.379172 - 0.954880I$ $a = 0.501065 + 0.020288I$ $b = 0.95093 + 2.01516I$	$-3.54308 + 4.03035I$	$-8.72949 - 8.88482I$
$u = -0.379172 + 0.954880I$ $a = 0.501065 - 0.020288I$ $b = 0.95093 - 2.01516I$	$-3.54308 - 4.03035I$	$-8.72949 + 8.88482I$
$u = -0.287539 - 0.230477I$ $a = 2.03295 + 0.85038I$ $b = -0.980634 - 0.158120I$	$-1.91160 - 0.92204I$	$-3.30845 + 0.88312I$
$u = -0.287539 + 0.230477I$ $a = 2.03295 - 0.85038I$ $b = -0.980634 + 0.158120I$	$-1.91160 + 0.92204I$	$-3.30845 - 0.88312I$
$u = -0.255209 - 0.948908I$ $a = -1.042638 - 0.374322I$ $b = -2.04192 + 0.64047I$	$-4.38791 + 0.83519I$	$-11.90532 - 1.80779I$
$u = -0.255209 + 0.948908I$ $a = -1.042638 + 0.374322I$ $b = -2.04192 - 0.64047I$	$-4.38791 - 0.83519I$	$-11.90532 + 1.80779I$
$u = -0.042517 - 0.896108I$ $a = -0.268781 - 0.514883I$ $b = -1.50275 - 1.00485I$	$-1.88737 - 1.49983I$	$-7.09909 + 4.37897I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.042517 + 0.896108I$ $a = -0.268781 + 0.514883I$ $b = -1.50275 + 1.00485I$	$-1.88737 + 1.49983I$	$-7.09909 - 4.37897I$
$u = -0.026760 - 1.174523I$ $a = 1.029311 + 0.303686I$ $b = 1.65520 + 0.65340I$	$-7.09632 - 4.52850I$	$-10.34033 + 4.25760I$
$u = -0.026760 + 1.174523I$ $a = 1.029311 - 0.303686I$ $b = 1.65520 - 0.65340I$	$-7.09632 + 4.52850I$	$-10.34033 - 4.25760I$
$u = 0.268889 - 0.735800I$ $a = -0.25691 - 1.97444I$ $b = -2.05899 - 1.16628I$	$-1.59108 - 1.22204I$	$-11.25340 + 3.73985I$
$u = 0.268889 + 0.735800I$ $a = -0.25691 + 1.97444I$ $b = -2.05899 + 1.16628I$	$-1.59108 + 1.22204I$	$-11.25340 - 3.73985I$
$u = 0.350482 - 0.867729I$ $a = 1.52415 + 2.82114I$ $b = 2.39364 + 0.40176I$	$-2.05273 - 1.79214I$	$-3.9608 - 27.3479I$
$u = 0.350482 + 0.867729I$ $a = 1.52415 - 2.82114I$ $b = 2.39364 - 0.40176I$	$-2.05273 + 1.79214I$	$-3.9608 + 27.3479I$
$u = 0.393745 - 1.260008I$ $a = 0.955717 - 0.999785I$ $b = 2.67784 - 1.24472I$	$-12.22785 + 6.64210I$	$-8.44808 - 3.04159I$
$u = 0.393745 + 1.260008I$ $a = 0.955717 + 0.999785I$ $b = 2.67784 + 1.24472I$	$-12.22785 - 6.64210I$	$-8.44808 + 3.04159I$
$u = 0.416907 - 0.814224I$ $a = 0.477464 - 0.365364I$ $b = 0.394803 - 0.423441I$	$-0.06086 - 1.78141I$	$0.16593 + 3.65886I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.416907 + 0.814224I$ $a = 0.477464 + 0.365364I$ $b = 0.394803 + 0.423441I$	$-0.06086 + 1.78141I$	$0.16593 - 3.65886I$
$u = 0.420103 - 1.222354I$ $a = -0.592326 + 0.479793I$ $b = -2.61282 + 0.57494I$	$-6.68706 + 0.82473I$	$-6.76197 - 2.72355I$
$u = 0.420103 + 1.222354I$ $a = -0.592326 - 0.479793I$ $b = -2.61282 - 0.57494I$	$-6.68706 - 0.82473I$	$-6.76197 + 2.72355I$
$u = 0.448174 - 1.226545I$ $a = -0.558710 + 0.688441I$ $b = -1.70773 + 0.09090I$	$-10.71551 - 2.40472I$	$-12.03987 + 0.33417I$
$u = 0.448174 + 1.226545I$ $a = -0.558710 - 0.688441I$ $b = -1.70773 - 0.09090I$	$-10.71551 + 2.40472I$	$-12.03987 - 0.33417I$
$u = 0.457366 - 1.034949I$ $a = -0.241762 - 0.730168I$ $b = -0.747461 - 0.669285I$	$-0.33001 - 3.05900I$	$1.51979 + 5.07455I$
$u = 0.457366 + 1.034949I$ $a = -0.241762 + 0.730168I$ $b = -0.747461 + 0.669285I$	$-0.33001 + 3.05900I$	$1.51979 - 5.07455I$
$u = 0.468861 - 1.223143I$ $a = 0.789355 + 0.234003I$ $b = 2.74601 - 0.33365I$	$-10.56670 - 6.75210I$	$-11.57161 + 6.48191I$
$u = 0.468861 + 1.223143I$ $a = 0.789355 - 0.234003I$ $b = 2.74601 + 0.33365I$	$-10.56670 + 6.75210I$	$-11.57161 - 6.48191I$
$u = 0.488804 - 0.385911I$ $a = 1.289379 + 0.459288I$ $b = 0.403529 - 0.183900I$	$1.49244 - 0.86359I$	$5.03880 + 1.53624I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.488804 + 0.385911I$ $a = 1.289379 - 0.459288I$ $b = 0.403529 + 0.183900I$	$1.49244 + 0.86359I$	$5.03880 - 1.53624I$
$u = 0.490148 - 1.212657I$ $a = 0.852756 + 0.043707I$ $b = 3.07486 + 0.48626I$	$-6.18604 - 9.87507I$	$-5.65212 + 8.90207I$
$u = 0.490148 + 1.212657I$ $a = 0.852756 - 0.043707I$ $b = 3.07486 - 0.48626I$	$-6.18604 + 9.87507I$	$-5.65212 - 8.90207I$
$u = 0.517285 - 1.227495I$ $a = -1.385000 - 0.258737I$ $b = -3.77402 - 0.28861I$	$-11.3347 - 16.0510I$	$-7.14104 + 8.98990I$
$u = 0.517285 + 1.227495I$ $a = -1.385000 + 0.258737I$ $b = -3.77402 + 0.28861I$	$-11.3347 + 16.0510I$	$-7.14104 - 8.98990I$
$u = 0.637047 - 0.936500I$ $a = -0.491753 + 0.351693I$ $b = -0.317828 + 0.930103I$	$-2.16059 - 1.39700I$	$-10.38048 - 4.03093I$
$u = 0.637047 + 0.936500I$ $a = -0.491753 - 0.351693I$ $b = -0.317828 - 0.930103I$	$-2.16059 + 1.39700I$	$-10.38048 + 4.03093I$
$u = 0.688274 - 0.597046I$ $a = -0.760075 + 0.431895I$ $b = 0.177796 + 0.445216I$	$-1.20524 - 3.66120I$	$-3.96415 + 8.51812I$
$u = 0.688274 + 0.597046I$ $a = -0.760075 - 0.431895I$ $b = 0.177796 - 0.445216I$	$-1.20524 + 3.66120I$	$-3.96415 - 8.51812I$
$u = 0.816612 - 0.075250I$ $a = -0.445787 - 1.172264I$ $b = 0.036633 + 0.982310I$	$-2.82170 + 5.12577I$	$-2.55858 - 6.00397I$

Solution to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.816612 + 0.075250I$ $a = -0.445787 + 1.172264I$ $b = 0.036633 - 0.982310I$	$-2.82170 - 5.12577I$	$-2.55858 + 6.00397I$
$u = 0.824553 - 0.021951I$ $a = -0.660739 - 1.105182I$ $b = -0.732613 + 0.631471I$	$-7.00163 + 2.10905I$	$-8.59887 - 3.22074I$
$u = 0.824553 + 0.021951I$ $a = -0.660739 + 1.105182I$ $b = -0.732613 - 0.631471I$	$-7.00163 - 2.10905I$	$-8.59887 + 3.22074I$
$u = 0.873776 - 0.112840I$ $a = 0.86301 + 1.85824I$ $b = 0.325555 - 0.658517I$	$-7.98517 + 11.01329I$	$-4.27925 - 5.99396I$
$u = 0.873776 + 0.112840I$ $a = 0.86301 - 1.85824I$ $b = 0.325555 + 0.658517I$	$-7.98517 - 11.01329I$	$-4.27925 + 5.99396I$

III. u-Polynomials

Crossings	u-Polynomials at each crossings
c_1	$(u^2 + u + 1)(u^{65} + 2u^{64} + \dots + u - 1)$
c_2	$(u^2 + u + 1)(u^{65} + 36u^{64} + \dots - 5u - 1)$
c_3	$(u^2 - u + 1)(u^{65} + 2u^{64} + \dots - 77u - 209)$
c_4	$(u^2 - u + 1)(u^{65} - 14u^{63} + \dots - 51079u - 9713)$
c_5	$(u^2 - u + 1)(u^{65} + 2u^{64} + \dots + u - 1)$
c_6	$(u^2 + u + 1)(u^{65} + 2u^{64} + \dots - 27u + 17)$
c_7	$(u^2 + u + 1)(u^{65} + 2u^{64} + \dots + u + 1)$
c_8	$(u - 1)^2(u^{65} + 3u^{64} + \dots - 6u - 1)$
c_9	$u^2(u^{65} + 11u^{64} + \dots - 12u - 4)$
c_{10}	$(u + 1)^2(u^{65} + 3u^{64} + \dots - 6u - 1)$
c_{11}	$(u^2 - u + 1)(u^{65} + 2u^{64} + \dots - 27u + 17)$

IV. Riley Polynomials

Crossings	Riley Polynomials at each crossings
c_1, c_5	$(y^2 + y + 1)(y^{65} + 36y^{64} + \dots - 5y - 1)$
c_2	$(y^2 + y + 1)(y^{65} - 12y^{64} + \dots - 97y - 1)$
c_3	$(y^2 + y + 1)(y^{65} - 80y^{64} + \dots + 680999y - 43681)$
c_4	$(y^2 + y + 1)(y^{65} - 28y^{64} + \dots - 2.28328 \times 10^9 y - 9.43424 \times 10^7)$
c_6, c_{11}	$(y^2 + y + 1)(y^{65} - 60y^{64} + \dots - 15013y - 289)$
c_7	$(y^2 + y + 1)(y^{65} + 12y^{64} + \dots - 5y - 1)$
c_8	$(y - 1)^2(y^{65} - 51y^{64} + \dots - 94y - 1)$
c_9	$y^2(y^{65} + 15y^{64} + \dots - 152y - 16)$
c_{10}	$(y - 1)^2(y^{65} - 51y^{64} + \dots - 94y - 1)$