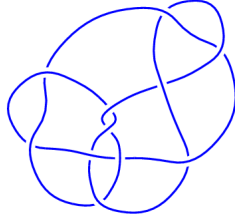
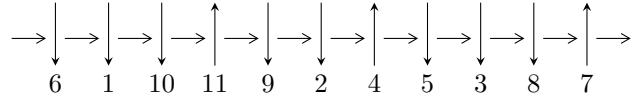


11a<sub>215</sub> (K11a<sub>215</sub>)

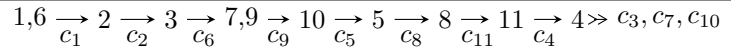


1

**Arc Sequences**



**Solving Sequence**



**Representation Ideals**

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

$$I_1^u = \langle a^{54} + 2a^{53} + \dots + 9363a - 1393,$$

$$1.01695 \times 10^{167}u - 9.94461 \times 10^{165}a^{53} + \dots + 1.21851 \times 10^{170}a - 2.44257 \times 10^{169},$$

$$5.27796 \times 10^{169}b - 4.59341 \times 10^{168}a^{53} + \dots + 3.55640 \times 10^{172}a - 5.96152 \times 10^{171} \rangle$$

$$I_2^u = \langle u^{15} - 4u^{13} + 8u^{11} - 8u^9 + u^8 + 4u^7 - 3u^6 + 4u^4 - 3u^2 + 1,$$

$$-u^{14} + u^{13} + 4u^{12} - 3u^{11} - 8u^{10} + 5u^9 + 8u^8 - 4u^7 - 3u^6 + 4u^5 - 2u^4 - 3u^3 + 2u^2 + a + 3u - 1,$$

$$3u^{14} + 2u^{13} - 10u^{12} - 7u^{11} + 17u^{10} + 12u^9 - 12u^8 - 6u^7 + 5u^6 - 5u^5 - 3u^4 + 8u^3 + 6u^2 + b - 3u - 2 \rangle$$

$$I_3^u = \langle u^{27} + 7u^{26} + \dots - 48u - 8, 11u^{26} + 37u^{25} + \dots + 4b + 68, -39u^{26} - 215u^{25} + \dots + 8a + 84 \rangle$$

There are 3 irreducible components with 96 representations.

---

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

$$\mathbf{I. } I_1^u = \langle a^{54} + 2a^{53} + \dots + 9363a - 1393, 1.02 \times 10^{167}u - 9.94 \times 10^{165}a^{53} + \dots + 1.22 \times 10^{170}a - 2.44 \times 10^{169}, 5.28 \times 10^{169}b - 4.59 \times 10^{168}a^{53} + \dots + 3.56 \times 10^{172}a - 5.96 \times 10^{171} \rangle$$

(i) Arc colorings

$$\begin{aligned} a_1 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0 \\ 0.0977887a^{53} + 0.250342a^{52} + \dots - 1198.20a + 240.186 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 1 \\ 0.0538920a^{53} + 0.141686a^{52} + \dots - 605.806a + 117.332 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -0.0538920a^{53} - 0.141686a^{52} + \dots + 605.806a - 116.332 \\ 0.0538920a^{53} + 0.141686a^{52} + \dots - 605.806a + 117.332 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.0977887a^{53} - 0.250342a^{52} + \dots + 1198.20a - 240.186 \\ 0.164647a^{53} + 0.427841a^{52} + \dots - 1938.51a + 384.066 \end{pmatrix} \\ a_9 &= \begin{pmatrix} a \\ 0.0870300a^{53} + 0.260200a^{52} + \dots - 673.821a + 112.951 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.0463089a^{53} - 0.131054a^{52} + \dots + 428.839a - 75.3828 \\ 0.119102a^{53} + 0.340749a^{52} + \dots - 1070.70a + 190.051 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 0.0304263a^{53} + 0.0777144a^{52} + \dots - 376.540a + 76.2869 \\ -0.0562729a^{53} - 0.178459a^{52} + \dots + 330.370a - 47.5743 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -0.0129782a^{53} - 0.0341698a^{52} + \dots + 150.161a - 29.2178 \\ 0.00993138a^{53} + 0.0445474a^{52} + \dots + 63.1327a - 22.2067 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -0.0951684a^{53} - 0.252650a^{52} + \dots + 1059.67a - 203.959 \\ 0.157534a^{53} + 0.413545a^{52} + \dots - 1792.57a + 348.118 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.0321020a^{53} - 0.0644232a^{52} + \dots + 583.254a - 129.652 \\ -0.0267630a^{53} - 0.100559a^{52} + \dots - 11.5698a + 21.8436 \end{pmatrix} \\ a_4 &= \begin{pmatrix} -0.0321020a^{53} - 0.0644232a^{52} + \dots + 583.254a - 129.652 \\ -0.0267630a^{53} - 0.100559a^{52} + \dots - 11.5698a + 21.8436 \end{pmatrix} \end{aligned}$$

(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
$u = -0.825933$ $a = -2.13223$ $b = 0.0458859$	$-7.24670$	$-19.6719$
$u = 0.141484 + 0.739668I$ $a = -1.60244 - 0.63623I$ $b = 1.45703 + 0.02575I$	$-2.52761 + 5.28254I$	$-6.81817 - 5.89242I$
$u = 0.141484 - 0.739668I$ $a = -1.60244 + 0.63623I$ $b = 1.45703 - 0.02575I$	$-2.52761 - 5.28254I$	$-6.81817 + 5.89242I$
$u = 1.172473 + 0.500383I$ $a = -1.45358 - 0.07349I$ $b = 1.96904 - 2.17781I$	$-9.64638 - 7.08493I$	$-16.5963 + 5.9133I$
$u = 1.172473 - 0.500383I$ $a = -1.45358 + 0.07349I$ $b = 1.96904 + 2.17781I$	$-9.64638 + 7.08493I$	$-16.5963 - 5.9133I$
$u = 0.772920 - 0.510351I$ $a = -1.236190 - 0.214856I$ $b = 1.04604 + 1.40839I$	$-0.12724 + 4.92150I$	$-3.97525 - 7.14228I$
$u = 0.772920 + 0.510351I$ $a = -1.236190 + 0.214856I$ $b = 1.04604 - 1.40839I$	$-0.12724 - 4.92150I$	$-3.97525 + 7.14228I$
$u = -0.825933$ $a = -1.029906 - 0.861392I$ $b = 0.11915 - 1.71750I$	$-3.10912 - 2.82812I$	$-13.14259 + 2.97945I$
$u = -0.825933$ $a = -1.029906 + 0.861392I$ $b = 0.11915 + 1.71750I$	$-3.10912 + 2.82812I$	$-13.14259 - 2.97945I$
$u = -1.173911 + 0.391555I$ $a = -1.011125 - 0.493762I$ $b = 0.915240 - 0.377798I$	$-10.41961 + 1.33617I$	$-18.3036 - 0.7017I$

Solution to $I_1^\mu$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.173911 - 0.391555I$ $a = -1.011125 + 0.493762I$ $b = 0.915240 + 0.377798I$	$-10.41961 - 1.33617I$	$-18.3036 + 0.7017I$
$u = -1.173911 + 0.391555I$ $a = -0.935437 - 0.418600I$ $b = 1.97962 + 0.66428I$	$-6.28202 - 1.49195I$	$-11.77434 + 2.27770I$
$u = -1.173911 - 0.391555I$ $a = -0.935437 + 0.418600I$ $b = 1.97962 - 0.66428I$	$-6.28202 + 1.49195I$	$-11.77434 - 2.27770I$
$u = 1.172473 - 0.500383I$ $a = -0.928612 - 0.471044I$ $b = 1.15411 + 1.13498I$	$-5.50880 + 4.25680I$	$-10.06705 - 2.93390I$
$u = 1.172473 + 0.500383I$ $a = -0.928612 + 0.471044I$ $b = 1.15411 - 1.13498I$	$-5.50880 - 4.25680I$	$-10.06705 + 2.93390I$
$u = 0.772920 - 0.510351I$ $a = -0.922500 - 0.802241I$ $b = -0.70168 + 2.13063I$	$-4.26482 + 2.09337I$	$-10.50452 - 4.16283I$
$u = 0.772920 + 0.510351I$ $a = -0.922500 + 0.802241I$ $b = -0.70168 - 2.13063I$	$-4.26482 - 2.09337I$	$-10.50452 + 4.16283I$
$u = 1.172473 + 0.500383I$ $a = -0.599053 - 0.972010I$ $b = 1.82341 - 0.55802I$	$-5.50880 - 9.91305I$	$-10.06705 + 8.89280I$
$u = 1.172473 - 0.500383I$ $a = -0.599053 + 0.972010I$ $b = 1.82341 + 0.55802I$	$-5.50880 + 9.91305I$	$-10.06705 - 8.89280I$
$u = 0.141484 + 0.739668I$ $a = -0.45572 - 2.28501I$ $b = 1.19309 + 0.78387I$	$-6.66520 + 2.45442I$	$-13.34743 - 2.91298I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.141484 - 0.739668I$ $a = -0.45572 + 2.28501I$ $b = 1.19309 - 0.78387I$	$-6.66520 - 2.45442I$	$-13.34743 + 2.91298I$
$u = 0.141484 - 0.739668I$ $a = -0.10533 - 1.69353I$ $b = -1.214669 + 0.333020I$	$-6.66520 - 2.45442I$	$-13.34743 + 2.91298I$
$u = 0.141484 + 0.739668I$ $a = -0.10533 + 1.69353I$ $b = -1.214669 - 0.333020I$	$-6.66520 + 2.45442I$	$-13.34743 - 2.91298I$
$u = -1.173911 + 0.391555I$ $a = -0.011223 - 0.440112I$ $b = -1.148048 - 0.694733I$	$-6.28202 + 4.16429I$	$-11.77434 - 3.68120I$
$u = -1.173911 - 0.391555I$ $a = -0.011223 + 0.440112I$ $b = -1.148048 + 0.694733I$	$-6.28202 - 4.16429I$	$-11.77434 + 3.68120I$
$u = -1.173911 - 0.391555I$ $a = 0.025693 - 1.135828I$ $b = 1.321975 + 0.120448I$	$-6.28202 + 1.49195I$	$-11.77434 - 2.27770I$
$u = -1.173911 + 0.391555I$ $a = 0.025693 + 1.135828I$ $b = 1.321975 - 0.120448I$	$-6.28202 - 1.49195I$	$-11.77434 + 2.27770I$
$u = 0.141484 - 0.739668I$ $a = 0.03391 - 1.69996I$ $b = -0.430980 - 0.193930I$	$-2.52761 - 5.28254I$	$-6.81817 + 5.89242I$
$u = 0.141484 + 0.739668I$ $a = 0.03391 + 1.69996I$ $b = -0.430980 + 0.193930I$	$-2.52761 + 5.28254I$	$-6.81817 - 5.89242I$
$u = 1.172473 - 0.500383I$ $a = 0.113412 - 0.508630I$ $b = -0.596613 - 0.665610I$	$-5.50880 + 4.25680I$	$-10.06705 - 2.93390I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.172473 + 0.500383I$ $a = 0.113412 + 0.508630I$ $b = -0.596613 + 0.665610I$	$-5.50880 - 4.25680I$	$-10.06705 + 2.93390I$
$u = 0.772920 - 0.510351I$ $a = 0.357556 - 0.871688I$ $b = -0.462155 - 1.019551I$	$-0.12724 + 4.92150I$	$-3.97525 - 7.14228I$
$u = 0.772920 + 0.510351I$ $a = 0.357556 + 0.871688I$ $b = -0.462155 + 1.019551I$	$-0.12724 - 4.92150I$	$-3.97525 + 7.14228I$
$u = 0.141484 + 0.739668I$ $a = 0.54653 - 1.48895I$ $b = -0.089875 + 0.288607I$	$-2.52761 - 0.37370I$	$-6.81817 + 0.06647I$
$u = 0.141484 - 0.739668I$ $a = 0.54653 + 1.48895I$ $b = -0.089875 - 0.288607I$	$-2.52761 + 0.37370I$	$-6.81817 - 0.06647I$
$u = 0.772920 + 0.510351I$ $a = 0.553569 - 0.981319I$ $b = 0.664688 + 0.196044I$	$-0.127239 + 0.734748I$	$-3.97525 + 1.18338I$
$u = 0.772920 - 0.510351I$ $a = 0.553569 + 0.981319I$ $b = 0.664688 - 0.196044I$	$-0.127239 - 0.734748I$	$-3.97525 - 1.18338I$
$u = 0.141484 + 0.739668I$ $a = 0.598473 - 0.021272I$ $b = -0.952464 - 0.167947I$	$-2.52761 - 0.37370I$	$-6.81817 + 0.06647I$
$u = 0.141484 - 0.739668I$ $a = 0.598473 + 0.021272I$ $b = -0.952464 + 0.167947I$	$-2.52761 + 0.37370I$	$-6.81817 - 0.06647I$
$u = 0.772920 - 0.510351I$ $a = 0.626881 - 0.233581I$ $b = -1.342381 + 0.014784I$	$-0.127239 - 0.734748I$	$-3.97525 - 1.18338I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.772920 + 0.510351I$ $a = 0.626881 + 0.233581I$ $b = -1.342381 - 0.014784I$	$-0.127239 + 0.734748I$	$-3.97525 + 1.18338I$
$u = -0.825933$ $a = 0.896484 - 0.050522I$ $b = -0.75222 + 2.12999I$	$-3.10912 + 2.82812I$	$-13.14259 - 2.97945I$
$u = -0.825933$ $a = 0.896484 + 0.050522I$ $b = -0.75222 - 2.12999I$	$-3.10912 - 2.82812I$	$-13.14259 + 2.97945I$
$u = 1.172473 + 0.500383I$ $a = 0.980819 - 0.204104I$ $b = -1.73088 + 2.38166I$	$-9.64638 - 7.08493I$	$-16.5963 + 5.9133I$
$u = 1.172473 - 0.500383I$ $a = 0.980819 + 0.204104I$ $b = -1.73088 - 2.38166I$	$-9.64638 + 7.08493I$	$-16.5963 - 5.9133I$
$u = 1.172473 + 0.500383I$ $a = 1.057378 - 0.217212I$ $b = -2.20113 + 1.18127I$	$-5.50880 - 9.91305I$	$-10.06705 + 8.89280I$
$u = 1.172473 - 0.500383I$ $a = 1.057378 + 0.217212I$ $b = -2.20113 - 1.18127I$	$-5.50880 + 9.91305I$	$-10.06705 - 8.89280I$
$u = -1.173911 - 0.391555I$ $a = 1.102811 - 0.052187I$ $b = -1.80524 + 0.87829I$	$-6.28202 - 4.16429I$	$-11.77434 + 3.68120I$
$u = -1.173911 + 0.391555I$ $a = 1.102811 + 0.052187I$ $b = -1.80524 - 0.87829I$	$-6.28202 + 4.16429I$	$-11.77434 - 3.68120I$
$u = -1.173911 - 0.391555I$ $a = 1.25202 - 0.93000I$ $b = -0.453824 + 0.985590I$	$-10.41961 - 1.33617I$	$-18.3036 + 0.7017I$

Solution to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.173911 + 0.391555I$ $a = 1.25202 + 0.93000I$ $b = -0.453824 - 0.985590I$	$-10.41961 + 1.33617I$	$-18.3036 - 0.7017I$
$u = 0.772920 + 0.510351I$ $a = 1.322322 - 0.353419I$ $b = 0.57742 + 1.85565I$	$-4.26482 - 2.09337I$	$-10.50452 + 4.16283I$
$u = 0.772920 - 0.510351I$ $a = 1.322322 + 0.353419I$ $b = 0.57742 - 1.85565I$	$-4.26482 + 2.09337I$	$-10.50452 - 4.16283I$
$u = -0.825933$ $a = 1.77874$ $b = -1.72318$	$-7.24670$	$-19.6719$



**II.**

$$I_2^u = \langle u^{15} - 4u^{13} + \dots - 3u^2 + 1, -u^{14} + u^{13} + \dots + a - 1, 3u^{14} + 2u^{13} + \dots + b - 2 \rangle$$

**(i) Arc colorings**

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

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

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

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

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

$$a_9 = \begin{pmatrix} u^{14} - u^{13} + \dots - 3u + 1 \\ -3u^{14} - 2u^{13} + \dots + 3u + 2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^{14} - u^{13} + \dots - 3u + 2 \\ -2u^{14} - 2u^{13} + \dots + 2u + 2 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -u^{14} + 2u^{13} + \dots + 3u - 3 \\ 2u^{14} - 8u^{12} + \dots - 3u - 1 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -u^{14} + u^{13} + \dots + u - 3 \\ -u^{14} - u^{13} + \dots - 4u^2 + 1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -2u^{14} + 2u^{13} + \dots + 4u - 3 \\ u^{14} - 4u^{12} + \dots - 2u - 1 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -2u^{14} + 2u^{13} + \dots + 4u - 3 \\ u^{14} - 4u^{12} + \dots - 2u - 1 \end{pmatrix}$$

**(ii) Obstruction class = 1**

**(iii) Cusp Shapes = unknown**

(iv) Complex Volumes and Cusp Shapes

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.162555 - 0.361615I$ $a = -1.120248 + 0.582291I$ $b = 0.660118 - 0.236089I$	$-9.32095 - 1.76748I$	$-10.54757 + 3.86534I$
$u = -1.162555 + 0.361615I$ $a = -1.120248 - 0.582291I$ $b = 0.660118 + 0.236089I$	$-9.32095 + 1.76748I$	$-10.54757 - 3.86534I$
$u = -1.030727 - 0.548115I$ $a = -0.554888 + 0.021001I$ $b = 0.302799 + 0.057383I$	$-2.19303 - 6.66891I$	$-10.29248 + 6.91128I$
$u = -1.030727 + 0.548115I$ $a = -0.554888 - 0.021001I$ $b = 0.302799 - 0.057383I$	$-2.19303 + 6.66891I$	$-10.29248 - 6.91128I$
$u = -0.729970$ $a = 2.20257$ $b = -0.929387$	$-6.71059$	$-0.932186$
$u = -0.589578 - 0.609250I$ $a = 0.336682 - 0.787235I$ $b = -0.317510 + 0.284639I$	$-0.80356 + 2.07411I$	$-6.98577 - 3.75045I$
$u = -0.589578 + 0.609250I$ $a = 0.336682 + 0.787235I$ $b = -0.317510 - 0.284639I$	$-0.80356 - 2.07411I$	$-6.98577 + 3.75045I$
$u = 0.221545 - 0.858385I$ $a = -0.07620 - 1.43844I$ $b = -0.887484 + 0.653259I$	$-5.11182 - 1.76571I$	$-6.58449 + 0.22254I$
$u = 0.221545 + 0.858385I$ $a = -0.07620 + 1.43844I$ $b = -0.887484 - 0.653259I$	$-5.11182 + 1.76571I$	$-6.58449 - 0.22254I$
$u = 0.734119 - 0.278311I$ $a = -1.073132 + 0.254571I$ $b = -0.37456 + 2.21826I$	$-2.27700 + 3.62441I$	$-5.96892 - 8.49008I$

Solution to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.734119 + 0.278311I$ $a = -1.073132 - 0.254571I$ $b = -0.37456 - 2.21826I$	$-2.27700 - 3.62441I$	$-5.96892 + 8.49008I$
$u = 0.997247 - 0.392970I$ $a = 0.361368 + 0.584717I$ $b = 1.13294 - 1.49383I$	$-3.33424 - 0.63342I$	$-10.18580 + 1.00493I$
$u = 0.997247 + 0.392970I$ $a = 0.361368 - 0.584717I$ $b = 1.13294 + 1.49383I$	$-3.33424 + 0.63342I$	$-10.18580 - 1.00493I$
$u = 1.194933 - 0.516966I$ $a = 1.025130 + 0.075677I$ $b = -1.55161 - 1.86013I$	$-8.14772 + 6.78722I$	$-9.96888 - 3.95233I$
$u = 1.194933 + 0.516966I$ $a = 1.025130 - 0.075677I$ $b = -1.55161 + 1.86013I$	$-8.14772 - 6.78722I$	$-9.96888 + 3.95233I$

$$\text{III. } I_3^u = \langle u^{27} + 7u^{26} + \dots - 48u - 8, 11u^{26} + 37u^{25} + \dots + 4b + 68, -39u^{26} - 215u^{25} + \dots + 8a + 84 \rangle$$

(i) Arc colorings

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

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

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

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

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

$$a_9 = \begin{pmatrix} 4.87500u^{26} + 26.8750u^{25} + \dots - 72.5000u - 10.5000 \\ -\frac{11}{4}u^{26} - \frac{37}{4}u^{25} + \dots - \frac{149}{2}u - 17 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} \frac{13}{2}u^{26} + \frac{97}{8}u^{25} + \dots - 127u - \frac{55}{2} \\ -\frac{27}{4}u^{26} - \frac{153}{4}u^{25} + \dots + \frac{407}{2}u + 39 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} \frac{9}{2}u^{26} + 29u^{25} + \dots - 228u - \frac{87}{2} \\ -8u^{26} - \frac{91}{2}u^{25} + \dots + \frac{369}{2}u + 28 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 2u^{26} + \frac{39}{4}u^{25} + \dots + \frac{123}{4}u + 10 \\ -\frac{9}{4}u^{26} - \frac{49}{4}u^{25} + \dots + 29u + 4 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -u^{26} - 7u^{25} + \dots + \frac{119}{2}u + \frac{25}{2} \\ 7u^{26} + \frac{81}{2}u^{25} + \dots - \frac{375}{2}u - 32 \end{pmatrix}$$

$$a_4 = \begin{pmatrix} -u^{26} - 7u^{25} + \dots + \frac{119}{2}u + \frac{25}{2} \\ 7u^{26} + \frac{81}{2}u^{25} + \dots - \frac{375}{2}u - 32 \end{pmatrix}$$

(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
$u = -1.257528 - 0.592160I$		
$a = 0.908395 - 0.189549I$	$-9.04410 - 7.78302I$	$-15.7321 + 8.2671I$
$b = -1.20024 + 1.59666I$		
$u = -1.257528 + 0.592160I$		
$a = 0.908395 + 0.189549I$	$-9.04410 + 7.78302I$	$-15.7321 - 8.2671I$
$b = -1.20024 - 1.59666I$		
$u = -1.212518 - 0.560901I$		
$a = -1.212226 + 0.103780I$	$-11.0486 - 16.7322I$	$-11.0194 + 9.0355I$
$b = 1.76649 - 2.05499I$		
$u = -1.212518 + 0.560901I$		
$a = -1.212226 - 0.103780I$	$-11.0486 + 16.7322I$	$-11.0194 - 9.0355I$
$b = 1.76649 + 2.05499I$		
$u = -1.095641 - 0.533268I$		
$a = 0.249390 + 0.439783I$	$-0.99910 - 6.61566I$	$-2.67665 + 5.91111I$
$b = -1.129645 - 0.129992I$		
$u = -1.095641 + 0.533268I$		
$a = 0.249390 - 0.439783I$	$-0.99910 + 6.61566I$	$-2.67665 - 5.91111I$
$b = -1.129645 + 0.129992I$		
$u = -0.942577 - 0.503851I$		
$a = -0.675631 - 0.306822I$	$1.12638 - 3.49850I$	$-2.08740 + 6.42119I$
$b = 1.12591 - 1.08543I$		
$u = -0.942577 + 0.503851I$		
$a = -0.675631 + 0.306822I$	$1.12638 + 3.49850I$	$-2.08740 - 6.42119I$
$b = 1.12591 + 1.08543I$		
$u = -0.921192 - 0.733170I$		
$a = 0.988416 - 0.453893I$	$-3.51361 - 8.92967I$	$-8.84256 + 8.65936I$
$b = -0.23315 + 1.72085I$		
$u = -0.921192 + 0.733170I$		
$a = 0.988416 + 0.453893I$	$-3.51361 + 8.92967I$	$-8.84256 - 8.65936I$
$b = -0.23315 - 1.72085I$		

Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.707332 - 0.846348I$ $a = -0.579546 + 0.942019I$ $b = -0.626114 - 1.209861I$	$-2.83672 + 3.13233I$	$-8.60430 - 4.73932I$
$u = -0.707332 + 0.846348I$ $a = -0.579546 - 0.942019I$ $b = -0.626114 + 1.209861I$	$-2.83672 - 3.13233I$	$-8.60430 + 4.73932I$
$u = -0.583614 - 0.540343I$ $a = -0.285105 - 0.838035I$ $b = 1.003090 - 0.242878I$	$2.16469 - 0.74717I$	$1.19667 + 1.31837I$
$u = -0.583614 + 0.540343I$ $a = -0.285105 + 0.838035I$ $b = 1.003090 + 0.242878I$	$2.16469 + 0.74717I$	$1.19667 - 1.31837I$
$u = -0.323531 - 0.655078I$ $a = 0.785223 + 0.312454I$ $b = -0.417023 + 0.505993I$	$1.20723 + 1.99852I$	$0.24096 - 2.02450I$
$u = -0.323531 + 0.655078I$ $a = 0.785223 - 0.312454I$ $b = -0.417023 - 0.505993I$	$1.20723 - 1.99852I$	$0.24096 + 2.02450I$
$u = -0.250449 - 1.038144I$ $a = -0.104665 + 1.151940I$ $b = -0.672570 - 0.691587I$	$-5.84917 + 1.93910I$	$-18.8822 - 3.3310I$
$u = -0.250449 + 1.038144I$ $a = -0.104665 - 1.151940I$ $b = -0.672570 + 0.691587I$	$-5.84917 - 1.93910I$	$-18.8822 + 3.3310I$
$u = -0.206067 - 0.899919I$ $a = -0.16955 - 1.69100I$ $b = 1.132729 + 0.652854I$	$-8.00804 + 11.41821I$	$-8.36312 - 5.92536I$
$u = -0.206067 + 0.899919I$ $a = -0.16955 + 1.69100I$ $b = 1.132729 - 0.652854I$	$-8.00804 - 11.41821I$	$-8.36312 + 5.92536I$

Solution to $I_3^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.624607$ $a = 0.757351$ $b = -0.291176$	-0.948941	-10.2362
$u = 1.061347 - 0.298652I$ $a = 0.128840 - 0.428875I$ $b = -0.038098 + 0.233966I$	$-2.59299 + 0.52735I$	$-7.52998 - 1.76243I$
$u = 1.061347 + 0.298652I$ $a = 0.128840 + 0.428875I$ $b = -0.038098 - 0.233966I$	$-2.59299 - 0.52735I$	$-7.52998 + 1.76243I$
$u = 1.280653 - 0.313658I$ $a = 1.061078 + 0.581886I$ $b = -0.638901 - 0.268684I$	$-12.8060 - 7.3523I$	$-13.07121 + 3.51912I$
$u = 1.280653 + 0.313658I$ $a = 1.061078 - 0.581886I$ $b = -0.638901 + 0.268684I$	$-12.8060 + 7.3523I$	$-13.07121 - 3.51912I$
$u = 1.346145 - 0.244793I$ $a = -0.973293 - 0.231834I$ $b = 0.573112 + 0.091265I$	$-11.47790 + 2.36837I$	$-17.5105 - 3.3278I$
$u = 1.346145 + 0.244793I$ $a = -0.973293 + 0.231834I$ $b = 0.573112 - 0.091265I$	$-11.47790 - 2.36837I$	$-17.5105 + 3.3278I$

#### IV. u-Polynomials

Crossings	u-Polynomials at each crossings
$c_1$	$(u^9 - u^8 - 2u^7 + 3u^6 + u^5 - 3u^4 + 2u^3 - u + 1)^6$ $(u^{15} - 4u^{13} + 8u^{11} - 8u^9 + u^8 + 4u^7 - 3u^6 + 4u^4 - 3u^2 + 1)$ $(u^{27} + 7u^{26} + \dots - 48u - 8)$
$c_2$	$(u^9 + 5u^8 + 12u^7 + 15u^6 + 9u^5 - u^4 - 4u^3 - 2u^2 + u + 1)^6$ $(u^{15} + 8u^{14} + \dots + 6u + 1)(u^{27} + 13u^{26} + \dots + 224u + 64)$
$c_3, c_8$	$(u^{15} - u^{14} + \dots - u + 1)(u^{27} + u^{26} + \dots + 2u + 1)$ $(u^{54} - u^{53} + \dots - 2672u - 1393)$
$c_4, c_7$	$(u^{15} + 2u^{13} - u^{12} + 3u^{11} - u^{10} + 2u^9 + u^7 + 2u^6 - 3u^5 + 4u^4 + 1)$ $(u^{27} + 3u^{25} + \dots + 3u - 1)(u^{54} + 3u^{53} + \dots - 946u - 229)$
$c_5, c_9$	$(u^{15} + u^{14} + \dots - u - 1)(u^{27} + u^{26} + \dots + 2u + 1)$ $(u^{54} - u^{53} + \dots - 2672u - 1393)$
$c_6$	$(u^9 - u^8 - 2u^7 + 3u^6 + u^5 - 3u^4 + 2u^3 - u + 1)^6$ $(u^{15} - 4u^{13} + 8u^{11} - 8u^9 - u^8 + 4u^7 + 3u^6 - 4u^4 + 3u^2 - 1)$ $(u^{27} + 7u^{26} + \dots - 48u - 8)$
$c_{10}$	$(u^3 - u^2 + 1)^{18}(u^{15} + 4u^{14} + \dots + 2u^2 - 1)$ $(u^{27} + 27u^{26} + \dots - 7424u - 512)$
$c_{11}$	$(u^9 - 3u^8 + 8u^7 - 13u^6 + 17u^5 - 17u^4 + 12u^3 - 6u^2 + u + 1)^6$ $(u^{15} + 4u^{13} + \dots - 6u^2 + 1)(u^{27} + 21u^{26} + \dots - 19888u - 2664)$



## V. Riley Polynomials

Crossings	Riley Polynomials at each crossings
$c_1, c_6$	$(y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)^6$ $(y^{15} - 8y^{14} + \dots + 6y - 1)(y^{27} - 13y^{26} + \dots + 224y - 64)$
$c_2$	$(y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1)^6$ $(y^{15} + 16y^{13} + \dots + 2y - 1)(y^{27} - y^{26} + \dots + 2560y - 4096)$
$c_3, c_5, c_8$ $c_9$	$(y^{15} - 15y^{14} + \dots + 11y - 1)(y^{27} - 25y^{26} + \dots - 10y - 1)$ $(y^{54} - 45y^{53} + \dots + 8846484y + 1940449)$
$c_4, c_7$	$(y^{15} + 4y^{14} + \dots - 8y^2 - 1)(y^{27} + 6y^{26} + \dots + 3y - 1)$ $(y^{54} + 15y^{53} + \dots + 1004868y + 52441)$
$c_{10}$	$(y^3 - y^2 + 2y - 1)^{18}(y^{15} - 4y^{14} + \dots + 4y - 1)$ $(y^{27} - 5y^{26} + \dots + 2424832y - 262144)$
$c_{11}$	$(y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1)^6$ $(y^{15} + 8y^{14} + \dots + 12y - 1)$ $(y^{27} + 15y^{26} + \dots + 24224224y - 7096896)$