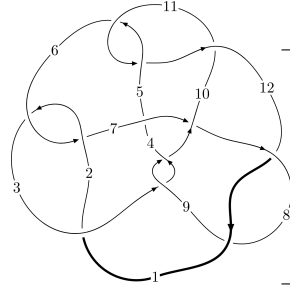
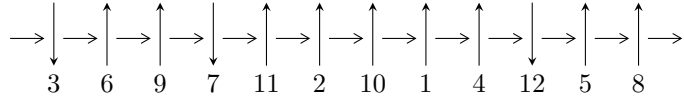


12a<sub>0349</sub> (K12a<sub>0349</sub>)



A knot diagram<sup>1</sup>

**Linearized knot diagram**



**Solving Sequence**

$$4,9 \xrightarrow{c_9} 10 \xrightarrow{c_3} 1,3 \xrightarrow{c_1} 2 \xrightarrow{c_8} 8 \xrightarrow{c_7} 7 \xrightarrow{c_4} 5 \xrightarrow{c_6} 6 \xrightarrow{c_{12}} 12 \xrightarrow{c_{11}} 11 \rightsquigarrow c_2, c_5, c_{10}$$

**Ideals for irreducible components<sup>2</sup> of  $X_{\text{par}}$**

$$I_1^u = \langle -7.25801 \times 10^{614} u^{135} - 1.28978 \times 10^{614} u^{134} + \dots + 2.94699 \times 10^{617} b - 2.64268 \times 10^{619}, \\ 4.49698 \times 10^{619} u^{135} + 1.54064 \times 10^{619} u^{134} + \dots + 1.54007 \times 10^{622} a + 2.15563 \times 10^{624}, \\ u^{136} - u^{135} + \dots + 41455u - 52259 \rangle$$

$$I_2^u = \langle -787618557348u^{33} + 143414944613u^{32} + \dots + 671837590333b - 713718628306, \\ 327280736279u^{33} - 33895731689u^{32} + \dots + 51679814641a + 286909653412, \\ u^{34} - 11u^{32} + \dots + 2u + 1 \rangle$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 170 representations.

<sup>1</sup>The image of knot diagram is generated by the software “**Draw programme**” developed by Andrew Bartholomew(<http://www.layer8.co.uk/maths/draw/index.htm#Running-draw>), where we modified some parts for our purpose(<https://github.com/CATsTAILs/LinksPainter>).

<sup>2</sup>All coefficients of polynomials are rational numbers. But the coefficients are sometimes approximated in decimal forms when there is not enough margin.

$$\text{I. } I_1^u = \langle -7.26 \times 10^{614} u^{135} - 1.29 \times 10^{614} u^{134} + \dots + 2.95 \times 10^{617} b - 2.64 \times 10^{619}, 4.50 \times 10^{619} u^{135} + 1.54 \times 10^{619} u^{134} + \dots + 1.54 \times 10^{622} a + 2.16 \times 10^{624}, u^{136} - u^{135} + \dots + 41455u - 52259 \rangle$$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.00291999u^{135} - 0.00100037u^{134} + \dots + 101.594u - 139.970 \\ 0.00246285u^{135} + 0.000437658u^{134} + \dots - 35.2110u + 89.6737 \end{pmatrix}$$

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

$$a_2 = \begin{pmatrix} -0.000710686u^{135} + 0.000924719u^{134} + \dots + 83.2059u - 86.6739 \\ 0.000253552u^{135} - 0.00148743u^{134} + \dots - 16.8227u + 36.3776 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.00106579u^{135} + 0.00182210u^{134} + \dots - 77.8349u - 10.5694 \\ 0.000388422u^{135} - 0.00145823u^{134} + \dots + 24.4776u + 16.6686 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.00366961u^{135} + 0.000243350u^{134} + \dots - 38.2923u - 178.156 \\ 0.00811285u^{135} + 0.000328503u^{134} + \dots + 10.1920u + 346.640 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} 0.00525780u^{135} + 0.00205419u^{134} + \dots + 58.3178u + 129.963 \\ -0.00963619u^{135} - 0.00170547u^{134} + \dots + 19.6587u - 336.226 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.00204050u^{135} - 0.000687504u^{134} + \dots - 147.377u - 146.621 \\ 0.00122108u^{135} - 0.000189226u^{134} + \dots + 65.7879u + 82.7173 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.000111542u^{135} + 0.000571574u^{134} + \dots + 200.475u - 84.6928 \\ 0.000506268u^{135} + 0.000750710u^{134} + \dots - 31.0308u + 33.3645 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.00578544u^{135} - 0.000673357u^{134} + \dots + 34.2870u + 164.152 \\ -0.00420817u^{135} + 0.00119197u^{134} + \dots - 47.0171u - 211.840 \end{pmatrix}$$

(ii) Obstruction class = -1

$$\text{(iii) Cusp Shapes} = 0.0131250u^{135} + 0.00168542u^{134} + \dots - 304.283u + 472.168$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{136} + 48u^{135} + \dots - 102u + 1$
$c_2, c_6$	$u^{136} - 2u^{135} + \dots - 16u + 1$
$c_3, c_9$	$u^{136} + u^{135} + \dots - 41455u - 52259$
$c_4$	$u^{136} - 2u^{135} + \dots - 22083596u + 1331611$
$c_5, c_{11}$	$u^{136} + u^{135} + \dots - 159u - 29$
$c_7$	$u^{136} + 17u^{135} + \dots + 2235391u - 2280599$
$c_8, c_{12}$	$u^{136} - 3u^{135} + \dots - 39789u - 1637$
$c_{10}$	$u^{136} + 57u^{135} + \dots + 15435u + 841$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{136} + 96y^{135} + \dots - 15098y + 1$
$c_2, c_6$	$y^{136} + 48y^{135} + \dots - 102y + 1$
$c_3, c_9$	$y^{136} - 105y^{135} + \dots + 83487901151y + 2731003081$
$c_4$	$y^{136} + 42y^{135} + \dots - 67453559308704y + 1773187855321$
$c_5, c_{11}$	$y^{136} + 57y^{135} + \dots + 15435y + 841$
$c_7$	$y^{136} - 51y^{135} + \dots - 522376161599385y + 5201131798801$
$c_8, c_{12}$	$y^{136} - 125y^{135} + \dots - 1327455299y + 2679769$
$c_{10}$	$y^{136} + 61y^{135} + \dots - 238478069y + 707281$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.498799 + 0.866094I$	$-4.50303 - 4.74190I$	0
$a = -0.436060 - 0.558485I$		
$b = 0.662135 - 0.538841I$		
$u = -0.498799 - 0.866094I$	$-4.50303 + 4.74190I$	0
$a = -0.436060 + 0.558485I$		
$b = 0.662135 + 0.538841I$		
$u = 0.826970 + 0.600798I$	$-1.75800 + 2.36640I$	0
$a = 0.168212 - 0.352238I$		
$b = 0.0463506 - 0.0222904I$		
$u = 0.826970 - 0.600798I$	$-1.75800 - 2.36640I$	0
$a = 0.168212 + 0.352238I$		
$b = 0.0463506 + 0.0222904I$		
$u = 1.018250 + 0.368549I$	$-0.444004 + 1.297180I$	0
$a = 0.770491 + 0.267374I$		
$b = 0.060181 - 0.841102I$		
$u = 1.018250 - 0.368549I$	$-0.444004 - 1.297180I$	0
$a = 0.770491 - 0.267374I$		
$b = 0.060181 + 0.841102I$		
$u = 0.383338 + 1.045300I$	$-4.49772 + 1.15309I$	0
$a = -0.906140 - 0.397448I$		
$b = 0.769089 - 0.302815I$		
$u = 0.383338 - 1.045300I$	$-4.49772 - 1.15309I$	0
$a = -0.906140 + 0.397448I$		
$b = 0.769089 + 0.302815I$		
$u = 1.085650 + 0.250615I$	$3.84092 - 3.61912I$	0
$a = 1.87655 - 0.66467I$		
$b = -1.178100 + 0.493630I$		
$u = 1.085650 - 0.250615I$	$3.84092 + 3.61912I$	0
$a = 1.87655 + 0.66467I$		
$b = -1.178100 - 0.493630I$		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.128210 + 0.248872I$ $a = -2.06384 - 0.62458I$ $b = 1.324680 + 0.280203I$	$4.88370 - 2.14023I$	0
$u = -1.128210 - 0.248872I$ $a = -2.06384 + 0.62458I$ $b = 1.324680 - 0.280203I$	$4.88370 + 2.14023I$	0
$u = 0.741762 + 0.370488I$ $a = -0.782095 - 0.542662I$ $b = 0.771346 + 0.548837I$	$2.97325 + 6.07187I$	0
$u = 0.741762 - 0.370488I$ $a = -0.782095 + 0.542662I$ $b = 0.771346 - 0.548837I$	$2.97325 - 6.07187I$	0
$u = -1.074630 + 0.468085I$ $a = -0.630806 + 0.475592I$ $b = -0.305784 - 0.924443I$	$-1.15651 - 5.70825I$	0
$u = -1.074630 - 0.468085I$ $a = -0.630806 - 0.475592I$ $b = -0.305784 + 0.924443I$	$-1.15651 + 5.70825I$	0
$u = -0.012027 + 0.819998I$ $a = -1.258350 - 0.607236I$ $b = 0.405550 - 0.387254I$	$-4.72424 + 1.17881I$	0
$u = -0.012027 - 0.819998I$ $a = -1.258350 + 0.607236I$ $b = 0.405550 + 0.387254I$	$-4.72424 - 1.17881I$	0
$u = 1.191520 + 0.099074I$ $a = 0.168512 - 0.219608I$ $b = 0.147167 + 1.002440I$	$-0.123641 + 0.387688I$	0
$u = 1.191520 - 0.099074I$ $a = 0.168512 + 0.219608I$ $b = 0.147167 - 1.002440I$	$-0.123641 - 0.387688I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.010380 + 0.642743I$ $a = -0.109222 + 0.383626I$ $b = -0.629395 - 0.508709I$	$-2.95195 - 0.68534I$	0
$u = -1.010380 - 0.642743I$ $a = -0.109222 - 0.383626I$ $b = -0.629395 + 0.508709I$	$-2.95195 + 0.68534I$	0
$u = -1.186750 + 0.252223I$ $a = -2.47939 - 0.68192I$ $b = 1.287190 - 0.242120I$	$3.47467 - 4.90283I$	0
$u = -1.186750 - 0.252223I$ $a = -2.47939 + 0.68192I$ $b = 1.287190 + 0.242120I$	$3.47467 + 4.90283I$	0
$u = 0.343104 + 1.167900I$ $a = -0.470968 + 0.106725I$ $b = 1.278080 + 0.244005I$	$4.88186 + 6.91613I$	0
$u = 0.343104 - 1.167900I$ $a = -0.470968 - 0.106725I$ $b = 1.278080 - 0.244005I$	$4.88186 - 6.91613I$	0
$u = 1.191020 + 0.251853I$ $a = 2.75012 - 0.63705I$ $b = -1.216870 - 0.328350I$	$1.74851 + 9.99055I$	0
$u = 1.191020 - 0.251853I$ $a = 2.75012 + 0.63705I$ $b = -1.216870 + 0.328350I$	$1.74851 - 9.99055I$	0
$u = -0.690025 + 0.359037I$ $a = 0.868637 - 0.357805I$ $b = -0.885342 + 0.367725I$	$3.63008 - 0.51176I$	0
$u = -0.690025 - 0.359037I$ $a = 0.868637 + 0.357805I$ $b = -0.885342 - 0.367725I$	$3.63008 + 0.51176I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.191760 + 0.275531I$ $a = 2.35780 - 0.27157I$ $b = -1.066520 - 0.108097I$	$-1.69317 + 2.87992I$	0
$u = 1.191760 - 0.275531I$ $a = 2.35780 + 0.27157I$ $b = -1.066520 + 0.108097I$	$-1.69317 - 2.87992I$	0
$u = 1.212320 + 0.177160I$ $a = -0.453222 - 0.565868I$ $b = 0.49190 + 1.36716I$	$4.29649 + 6.33887I$	0
$u = 1.212320 - 0.177160I$ $a = -0.453222 + 0.565868I$ $b = 0.49190 - 1.36716I$	$4.29649 - 6.33887I$	0
$u = -1.203040 + 0.251480I$ $a = -1.96081 - 1.03235I$ $b = 1.37829 - 0.38252I$	$4.21947 - 4.92988I$	0
$u = -1.203040 - 0.251480I$ $a = -1.96081 + 1.03235I$ $b = 1.37829 + 0.38252I$	$4.21947 + 4.92988I$	0
$u = -1.199800 + 0.276918I$ $a = -1.46388 - 1.80780I$ $b = 1.273200 - 0.202497I$	$6.65926 - 8.40014I$	0
$u = -1.199800 - 0.276918I$ $a = -1.46388 + 1.80780I$ $b = 1.273200 + 0.202497I$	$6.65926 + 8.40014I$	0
$u = -1.190680 + 0.337098I$ $a = 0.609368 - 0.544612I$ $b = -0.169824 - 0.098711I$	$4.49958 + 0.42314I$	0
$u = -1.190680 - 0.337098I$ $a = 0.609368 + 0.544612I$ $b = -0.169824 + 0.098711I$	$4.49958 - 0.42314I$	0



Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.205100 + 0.283207I$		
$a = 1.13403 - 1.75333I$	$6.86769 + 3.46831I$	0
$b = -1.169630 - 0.162158I$		
$u = 1.205100 - 0.283207I$		
$a = 1.13403 + 1.75333I$	$6.86769 - 3.46831I$	0
$b = -1.169630 + 0.162158I$		
$u = 0.576409 + 0.493925I$		
$a = 0.710298 - 0.510172I$	$-1.61585 + 1.75968I$	$0. - 5.22601I$
$b = -0.238780 - 0.524795I$		
$u = 0.576409 - 0.493925I$		
$a = 0.710298 + 0.510172I$	$-1.61585 - 1.75968I$	$0. + 5.22601I$
$b = -0.238780 + 0.524795I$		
$u = -1.233510 + 0.161334I$		
$a = 0.543320 - 0.322615I$	$5.45984 - 0.99127I$	0
$b = -0.614038 + 1.201870I$		
$u = -1.233510 - 0.161334I$		
$a = 0.543320 + 0.322615I$	$5.45984 + 0.99127I$	0
$b = -0.614038 - 1.201870I$		
$u = -1.230320 + 0.209835I$		
$a = -1.98825 - 0.27899I$	$8.07893 - 2.72547I$	0
$b = 1.79834 - 0.75347I$		
$u = -1.230320 - 0.209835I$		
$a = -1.98825 + 0.27899I$	$8.07893 + 2.72547I$	0
$b = 1.79834 + 0.75347I$		
$u = 1.244130 + 0.214055I$		
$a = 1.85177 - 0.15065I$	$8.00044 + 8.02794I$	0
$b = -1.71200 - 0.94089I$		
$u = 1.244130 - 0.214055I$		
$a = 1.85177 + 0.15065I$	$8.00044 - 8.02794I$	0
$b = -1.71200 + 0.94089I$		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.260750 + 0.101482I$ $a = 0.087206 + 0.606900I$ $b = -0.406888 + 0.534008I$	$4.71068 + 1.16973I$	0
$u = -1.260750 - 0.101482I$ $a = 0.087206 - 0.606900I$ $b = -0.406888 - 0.534008I$	$4.71068 - 1.16973I$	0
$u = -0.347679 + 0.646470I$ $a = 0.313440 - 0.434009I$ $b = -1.092720 - 0.365009I$	$0.83096 + 1.63119I$	$6.00000 + 0.I$
$u = -0.347679 - 0.646470I$ $a = 0.313440 + 0.434009I$ $b = -1.092720 + 0.365009I$	$0.83096 - 1.63119I$	$6.00000 + 0.I$
$u = 0.278257 + 0.678305I$ $a = -0.301344 - 0.828814I$ $b = 1.123340 - 0.565730I$	$-1.05120 - 6.66868I$	$2.28364 + 5.13023I$
$u = 0.278257 - 0.678305I$ $a = -0.301344 + 0.828814I$ $b = 1.123340 + 0.565730I$	$-1.05120 + 6.66868I$	$2.28364 - 5.13023I$
$u = 1.228330 + 0.329481I$ $a = -0.217156 - 0.672459I$ $b = -0.156344 - 0.264716I$	$5.27413 + 4.87779I$	0
$u = 1.228330 - 0.329481I$ $a = -0.217156 + 0.672459I$ $b = -0.156344 + 0.264716I$	$5.27413 - 4.87779I$	0
$u = 1.245780 + 0.271487I$ $a = 0.992426 - 0.577867I$ $b = -0.955595 - 0.707427I$	$4.68025 + 5.68542I$	0
$u = 1.245780 - 0.271487I$ $a = 0.992426 + 0.577867I$ $b = -0.955595 + 0.707427I$	$4.68025 - 5.68542I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.281220 + 0.053871I$	$8.86520 + 4.47210I$	0
$a = 2.38479 + 1.15699I$		
$b = -1.266550 - 0.012230I$		
$u = -1.281220 - 0.053871I$	$8.86520 - 4.47210I$	0
$a = 2.38479 - 1.15699I$		
$b = -1.266550 + 0.012230I$		
$u = 1.279780 + 0.092109I$	$3.02656 - 6.18138I$	0
$a = 0.425482 + 0.809748I$		
$b = 0.149982 + 0.361418I$		
$u = 1.279780 - 0.092109I$	$3.02656 + 6.18138I$	0
$a = 0.425482 - 0.809748I$		
$b = 0.149982 - 0.361418I$		
$u = 1.287890 + 0.038683I$	$9.33412 + 0.55888I$	0
$a = -2.58929 + 0.80103I$		
$b = 1.337830 - 0.002434I$		
$u = 1.287890 - 0.038683I$	$9.33412 - 0.55888I$	0
$a = -2.58929 - 0.80103I$		
$b = 1.337830 + 0.002434I$		
$u = -1.304960 + 0.105080I$	$5.63228 + 0.61622I$	0
$a = 1.42846 + 0.60611I$		
$b = -1.199850 + 0.396405I$		
$u = -1.304960 - 0.105080I$	$5.63228 - 0.61622I$	0
$a = 1.42846 - 0.60611I$		
$b = -1.199850 - 0.396405I$		
$u = -0.144459 + 1.313610I$	$3.90971 - 12.53800I$	0
$a = -0.374310 - 0.172525I$		
$b = 1.40164 - 0.33249I$		
$u = -0.144459 - 1.313610I$	$3.90971 + 12.53800I$	0
$a = -0.374310 + 0.172525I$		
$b = 1.40164 + 0.33249I$		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.313910 + 1.287830I$ $a = 0.472119 + 0.072829I$ $b = -1.315130 + 0.124264I$	$6.33593 - 0.51455I$	0
$u = -0.313910 - 1.287830I$ $a = 0.472119 - 0.072829I$ $b = -1.315130 - 0.124264I$	$6.33593 + 0.51455I$	0
$u = 0.386398 + 0.547212I$ $a = -0.620616 - 0.119450I$ $b = 0.501871 + 0.419597I$	$-2.12050 + 1.59540I$	$3.74902 - 4.65992I$
$u = 0.386398 - 0.547212I$ $a = -0.620616 + 0.119450I$ $b = 0.501871 - 0.419597I$	$-2.12050 - 1.59540I$	$3.74902 + 4.65992I$
$u = 1.303990 + 0.281627I$ $a = 0.550886 + 0.246181I$ $b = -0.438250 - 1.341700I$	$4.67894 + 6.58435I$	0
$u = 1.303990 - 0.281627I$ $a = 0.550886 - 0.246181I$ $b = -0.438250 + 1.341700I$	$4.67894 - 6.58435I$	0
$u = -0.199724 + 0.633004I$ $a = -0.331527 - 0.916965I$ $b = 0.254410 - 0.849898I$	$-3.65766 + 1.54547I$	$-0.60215 - 1.59690I$
$u = -0.199724 - 0.633004I$ $a = -0.331527 + 0.916965I$ $b = 0.254410 + 0.849898I$	$-3.65766 - 1.54547I$	$-0.60215 + 1.59690I$
$u = -1.324650 + 0.279846I$ $a = -0.445901 + 0.495926I$ $b = 0.26082 - 1.57502I$	$3.27185 - 11.77960I$	0
$u = -1.324650 - 0.279846I$ $a = -0.445901 - 0.495926I$ $b = 0.26082 + 1.57502I$	$3.27185 + 11.77960I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.173911 + 0.614136I$ $a = -1.049210 - 0.418091I$ $b = -1.395700 + 0.124216I$	$3.55266 + 5.08054I$	$7.10040 - 5.21545I$
$u = -0.173911 - 0.614136I$ $a = -1.049210 + 0.418091I$ $b = -1.395700 - 0.124216I$	$3.55266 - 5.08054I$	$7.10040 + 5.21545I$
$u = -1.355170 + 0.164256I$ $a = 1.70136 + 0.07244I$ $b = -1.84388 + 0.74798I$	$8.54071 - 2.54613I$	0
$u = -1.355170 - 0.164256I$ $a = 1.70136 - 0.07244I$ $b = -1.84388 - 0.74798I$	$8.54071 + 2.54613I$	0
$u = -1.323940 + 0.336627I$ $a = 0.055473 + 0.207985I$ $b = -0.159194 - 1.089460I$	$-0.44519 - 5.21541I$	0
$u = -1.323940 - 0.336627I$ $a = 0.055473 - 0.207985I$ $b = -0.159194 + 1.089460I$	$-0.44519 + 5.21541I$	0
$u = 0.153358 + 0.612586I$ $a = 1.143770 - 0.331122I$ $b = 1.280970 + 0.236255I$	$3.68147 - 0.12296I$	$7.65398 - 1.76778I$
$u = 0.153358 - 0.612586I$ $a = 1.143770 + 0.331122I$ $b = 1.280970 - 0.236255I$	$3.68147 + 0.12296I$	$7.65398 + 1.76778I$
$u = 1.38341$ $a = -1.90486$ $b = 1.53700$	7.32589	0
$u = 1.374800 + 0.162105I$ $a = -1.77587 + 0.14913I$ $b = 1.98159 + 0.57441I$	$8.58778 - 2.40060I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.374800 - 0.162105I$ $a = -1.77587 - 0.14913I$ $b = 1.98159 - 0.57441I$	$8.58778 + 2.40060I$	0
$u = -0.241389 + 0.564582I$ $a = -0.445724 - 0.186832I$ $b = -1.266660 - 0.216828I$	$1.26446 + 1.87725I$	$1.72455 + 1.37285I$
$u = -0.241389 - 0.564582I$ $a = -0.445724 + 0.186832I$ $b = -1.266660 + 0.216828I$	$1.26446 - 1.87725I$	$1.72455 - 1.37285I$
$u = 0.082523 + 1.386240I$ $a = 0.418165 - 0.123647I$ $b = -1.386040 - 0.226009I$	$5.73615 + 6.10223I$	0
$u = 0.082523 - 1.386240I$ $a = 0.418165 + 0.123647I$ $b = -1.386040 + 0.226009I$	$5.73615 - 6.10223I$	0
$u = 0.034917 + 0.604044I$ $a = -1.80374 - 0.73700I$ $b = -0.119066 - 0.786436I$	$-1.06796 + 8.47241I$	$1.49531 - 7.33951I$
$u = 0.034917 - 0.604044I$ $a = -1.80374 + 0.73700I$ $b = -0.119066 + 0.786436I$	$-1.06796 - 8.47241I$	$1.49531 + 7.33951I$
$u = 0.018886 + 0.595127I$ $a = 1.70036 - 0.48671I$ $b = 0.230393 - 0.537414I$	$0.58538 - 3.27469I$	$3.78468 + 3.31399I$
$u = 0.018886 - 0.595127I$ $a = 1.70036 + 0.48671I$ $b = 0.230393 + 0.537414I$	$0.58538 + 3.27469I$	$3.78468 - 3.31399I$
$u = 0.053723 + 0.580575I$ $a = -1.002380 - 0.166228I$ $b = -0.006400 + 0.689918I$	$0.94880 - 3.60091I$	$5.82465 + 2.44388I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.053723 - 0.580575I$ $a = -1.002380 + 0.166228I$ $b = -0.006400 - 0.689918I$	$0.94880 + 3.60091I$	$5.82465 - 2.44388I$
$u = 0.020883 + 0.555314I$ $a = 1.134910 - 0.267332I$ $b = 0.197309 + 0.501629I$	$1.80782 - 1.49626I$	$6.78415 + 3.27323I$
$u = 0.020883 - 0.555314I$ $a = 1.134910 + 0.267332I$ $b = 0.197309 - 0.501629I$	$1.80782 + 1.49626I$	$6.78415 - 3.27323I$
$u = 1.44318 + 0.11936I$ $a = -1.67995 + 0.26473I$ $b = 1.82948 + 0.00577I$	$6.95559 + 0.43919I$	0
$u = 1.44318 - 0.11936I$ $a = -1.67995 - 0.26473I$ $b = 1.82948 - 0.00577I$	$6.95559 - 0.43919I$	0
$u = 0.105708 + 0.528582I$ $a = 1.354380 + 0.096403I$ $b = 0.873406 - 0.203217I$	$1.16264 - 2.60619I$	$1.18482 + 4.75090I$
$u = 0.105708 - 0.528582I$ $a = 1.354380 - 0.096403I$ $b = 0.873406 + 0.203217I$	$1.16264 + 2.60619I$	$1.18482 - 4.75090I$
$u = -0.481978$ $a = 0.594078$ $b = -0.416655$	0.665217	15.2060
$u = -1.47784 + 0.43082I$ $a = 1.72567 + 0.47967I$ $b = -1.53814 + 0.45456I$	$10.6735 - 12.4240I$	0
$u = -1.47784 - 0.43082I$ $a = 1.72567 - 0.47967I$ $b = -1.53814 - 0.45456I$	$10.6735 + 12.4240I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.55344 + 0.10900I$ $a = 1.44157 + 0.20125I$ $b = -1.58035 - 0.24449I$	$5.45113 + 3.49510I$	0
$u = -1.55344 - 0.10900I$ $a = 1.44157 - 0.20125I$ $b = -1.58035 + 0.24449I$	$5.45113 - 3.49510I$	0
$u = 1.49935 + 0.44562I$ $a = -1.64231 + 0.50746I$ $b = 1.54072 + 0.38761I$	$12.21970 + 6.40782I$	0
$u = 1.49935 - 0.44562I$ $a = -1.64231 - 0.50746I$ $b = 1.54072 - 0.38761I$	$12.21970 - 6.40782I$	0
$u = 1.48354 + 0.54598I$ $a = 1.57401 - 0.62192I$ $b = -1.56652 - 0.56845I$	$9.0849 + 18.9972I$	0
$u = 1.48354 - 0.54598I$ $a = 1.57401 + 0.62192I$ $b = -1.56652 + 0.56845I$	$9.0849 - 18.9972I$	0
$u = -1.49203 + 0.56699I$ $a = -1.51234 - 0.64668I$ $b = 1.53994 - 0.48713I$	$10.8185 - 12.8462I$	0
$u = -1.49203 - 0.56699I$ $a = -1.51234 + 0.64668I$ $b = 1.53994 + 0.48713I$	$10.8185 + 12.8462I$	0
$u = 0.115668 + 0.372722I$ $a = 1.31565 + 1.61399I$ $b = 1.277090 - 0.459503I$	$4.54366 - 5.65131I$	$8.94973 + 5.84127I$
$u = 0.115668 - 0.372722I$ $a = 1.31565 - 1.61399I$ $b = 1.277090 + 0.459503I$	$4.54366 + 5.65131I$	$8.94973 - 5.84127I$



Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.167729 + 0.348800I$ $a = -0.60238 + 1.71950I$ $b = -1.327230 - 0.356336I$	$4.83185 + 0.41381I$	$9.83959 + 1.29296I$
$u = -0.167729 - 0.348800I$ $a = -0.60238 - 1.71950I$ $b = -1.327230 + 0.356336I$	$4.83185 - 0.41381I$	$9.83959 - 1.29296I$
$u = -1.58612 + 0.37026I$ $a = 1.48814 + 0.29935I$ $b = -1.371910 + 0.315288I$	$4.88499 - 4.84019I$	0
$u = -1.58612 - 0.37026I$ $a = 1.48814 - 0.29935I$ $b = -1.371910 - 0.315288I$	$4.88499 + 4.84019I$	0
$u = -1.52129 + 0.71461I$ $a = -1.226440 - 0.670369I$ $b = 1.354320 - 0.209319I$	$10.12330 - 7.07095I$	0
$u = -1.52129 - 0.71461I$ $a = -1.226440 + 0.670369I$ $b = 1.354320 + 0.209319I$	$10.12330 + 7.07095I$	0
$u = 1.58581 + 0.56821I$ $a = 1.38584 - 0.51723I$ $b = -1.312760 - 0.455900I$	$3.33739 + 10.59300I$	0
$u = 1.58581 - 0.56821I$ $a = 1.38584 + 0.51723I$ $b = -1.312760 + 0.455900I$	$3.33739 - 10.59300I$	0
$u = 1.47126 + 0.82826I$ $a = 1.075230 - 0.679854I$ $b = -1.265390 - 0.096333I$	$7.96863 + 0.50689I$	0
$u = 1.47126 - 0.82826I$ $a = 1.075230 + 0.679854I$ $b = -1.265390 + 0.096333I$	$7.96863 - 0.50689I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.62638 + 0.55149I$ $a = -1.283440 + 0.505916I$ $b = 1.45751 + 0.15387I$	$10.86690 + 1.33856I$	0
$u = 1.62638 - 0.55149I$ $a = -1.283440 - 0.505916I$ $b = 1.45751 - 0.15387I$	$10.86690 - 1.33856I$	0
$u = -1.64823 + 0.68954I$ $a = 1.101240 + 0.523659I$ $b = -1.413370 + 0.044625I$	$8.35438 + 4.93614I$	0
$u = -1.64823 - 0.68954I$ $a = 1.101240 - 0.523659I$ $b = -1.413370 - 0.044625I$	$8.35438 - 4.93614I$	0
$u = 0.13418 + 1.79441I$ $a = -0.586195 - 0.049213I$ $b = 1.223930 - 0.084960I$	$-2.20261 - 2.53104I$	0
$u = 0.13418 - 1.79441I$ $a = -0.586195 + 0.049213I$ $b = 1.223930 + 0.084960I$	$-2.20261 + 2.53104I$	0

$$\text{II. } I_2^u = \langle -7.88 \times 10^{11}u^{33} + 1.43 \times 10^{11}u^{32} + \dots + 6.72 \times 10^{11}b - 7.14 \times 10^{11}, 3.27 \times 10^{11}u^{33} - 3.39 \times 10^{10}u^{32} + \dots + 5.17 \times 10^{10}a + 2.87 \times 10^{11}, u^{34} - 11u^{32} + \dots + 2u + 1 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_4 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_9 &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_{10} &= \begin{pmatrix} 1 \\ -u^2 \end{pmatrix} \\ a_1 &= \begin{pmatrix} -6.33285u^{33} + 0.655880u^{32} + \dots + 8.20715u - 5.55168 \\ 1.17233u^{33} - 0.213467u^{32} + \dots + 3.51840u + 1.06234 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_2 &= \begin{pmatrix} -5.07132u^{33} + 0.451750u^{32} + \dots + 3.93145u - 5.10926 \\ -0.0891988u^{33} - 0.00933745u^{32} + \dots + 7.79409u + 0.619925 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.729395u^{33} - 1.57109u^{32} + \dots + 9.40657u + 9.51047 \\ 0.0382059u^{33} + 1.04098u^{32} + \dots - 4.41279u - 1.57109 \end{pmatrix} \\ a_7 &= \begin{pmatrix} 0.729395u^{33} - 2.57109u^{32} + \dots + 11.4066u + 9.51047 \\ 0.0382059u^{33} + 2.04098u^{32} + \dots - 6.41279u - 2.57109 \end{pmatrix} \\ a_5 &= \begin{pmatrix} 5.01406u^{33} + 0.249896u^{32} + \dots - 8.45835u + 0.740135 \\ 1.87294u^{33} - 0.404136u^{32} + \dots - 2.84572u + 1.90344 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 1.13585u^{33} - 1.54783u^{32} + \dots + 3.48914u + 1.78390 \\ 0.694085u^{33} - 1.15461u^{32} + \dots + 2.70124u + 3.76176 \end{pmatrix} \\ a_{12} &= \begin{pmatrix} -4.46974u^{33} + 1.01554u^{32} + \dots - 1.56754u - 3.21373 \\ -1.14138u^{33} - 1.25053u^{32} + \dots + 5.27064u + 0.769913 \end{pmatrix} \\ a_{11} &= \begin{pmatrix} -0.188432u^{33} + 0.711017u^{32} + \dots - 12.8714u - 5.35223 \\ -1.04863u^{33} - 1.76781u^{32} + \dots + 7.71225u + 3.02224 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes

$$= -\frac{2535144021258}{671837590333}u^{33} - \frac{4265588581482}{671837590333}u^{32} + \dots + \frac{16708120824221}{671837590333}u + \frac{17275443371660}{671837590333}$$

(iv)  $u$ -Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{34} - 15u^{33} + \dots - 15u + 1$
$c_2$	$u^{34} - u^{33} + \dots - u + 1$
$c_3$	$u^{34} - 11u^{32} + \dots - 2u + 1$
$c_4$	$u^{34} - 3u^{33} + \dots + 5u + 1$
$c_5$	$u^{34} + 10u^{32} + \dots + 2u + 1$
$c_6$	$u^{34} + u^{33} + \dots + u + 1$
$c_7$	$u^{34} + 4u^{33} + \dots + 12u + 1$
$c_8$	$u^{34} - 2u^{33} + \dots - 14u + 1$
$c_9$	$u^{34} - 11u^{32} + \dots + 2u + 1$
$c_{10}$	$u^{34} - 20u^{33} + \dots - 28u + 1$
$c_{11}$	$u^{34} + 10u^{32} + \dots - 2u + 1$
$c_{12}$	$u^{34} + 2u^{33} + \dots + 14u + 1$



(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{34} + 23y^{33} + \dots + 11y + 1$
$c_2, c_6$	$y^{34} + 15y^{33} + \dots + 15y + 1$
$c_3, c_9$	$y^{34} - 22y^{33} + \dots - 16y + 1$
$c_4$	$y^{34} + 5y^{33} + \dots + 21y + 1$
$c_5, c_{11}$	$y^{34} + 20y^{33} + \dots + 28y + 1$
$c_7$	$y^{34} - 8y^{33} + \dots - 40y + 1$
$c_8, c_{12}$	$y^{34} - 38y^{33} + \dots - 86y + 1$
$c_{10}$	$y^{34} + 4y^{33} + \dots - 64y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.901051 + 0.514309I$		
$a = -0.262160 + 0.279684I$	$-2.16375 - 2.02505I$	$-2.39267 + 0.30437I$
$b = -0.153986 - 0.606755I$		
$u = -0.901051 - 0.514309I$		
$a = -0.262160 - 0.279684I$	$-2.16375 + 2.02505I$	$-2.39267 - 0.30437I$
$b = -0.153986 + 0.606755I$		
$u = 0.831407 + 0.470509I$		
$a = 0.745619 - 0.717151I$	$-3.36578 + 2.02219I$	$0.08481 - 3.32936I$
$b = 0.133151 + 0.051615I$		
$u = 0.831407 - 0.470509I$		
$a = 0.745619 + 0.717151I$	$-3.36578 - 2.02219I$	$0.08481 + 3.32936I$
$b = 0.133151 - 0.051615I$		
$u = 1.001050 + 0.422311I$		
$a = 1.00090 - 1.02718I$	$6.12005 + 1.93758I$	$10.72796 - 1.04035I$
$b = -1.318050 - 0.305503I$		
$u = 1.001050 - 0.422311I$		
$a = 1.00090 + 1.02718I$	$6.12005 - 1.93758I$	$10.72796 + 1.04035I$
$b = -1.318050 + 0.305503I$		
$u = 0.194072 + 1.094380I$		
$a = -1.125840 - 0.513605I$	$-4.28029 + 1.43131I$	$13.6515 - 10.3289I$
$b = 0.717799 - 0.142412I$		
$u = 0.194072 - 1.094380I$		
$a = -1.125840 + 0.513605I$	$-4.28029 - 1.43131I$	$13.6515 + 10.3289I$
$b = 0.717799 + 0.142412I$		
$u = -1.086190 + 0.298850I$		
$a = -1.19403 - 1.11200I$	$6.42161 - 7.11379I$	$11.25449 + 5.76614I$
$b = 1.332450 - 0.435101I$		
$u = -1.086190 - 0.298850I$		
$a = -1.19403 + 1.11200I$	$6.42161 + 7.11379I$	$11.25449 - 5.76614I$
$b = 1.332450 + 0.435101I$		



Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.680198 + 0.357650I$ $a = -1.36163 + 0.79178I$ $b = 0.719083 - 0.655685I$	$2.54587 - 5.51556I$	$4.27046 + 2.48507I$
$u = -0.680198 - 0.357650I$ $a = -1.36163 - 0.79178I$ $b = 0.719083 + 0.655685I$	$2.54587 + 5.51556I$	$4.27046 - 2.48507I$
$u = -1.223280 + 0.190245I$ $a = -1.54756 - 0.97220I$ $b = 1.178460 - 0.571811I$	$5.15320 - 4.36862I$	$11.67550 + 0.90519I$
$u = -1.223280 - 0.190245I$ $a = -1.54756 + 0.97220I$ $b = 1.178460 + 0.571811I$	$5.15320 + 4.36862I$	$11.67550 - 0.90519I$
$u = 1.299020 + 0.168024I$ $a = -1.82835 + 0.57508I$ $b = 1.66049 + 0.07334I$	$7.83210 + 0.83769I$	$13.30597 - 1.15346I$
$u = 1.299020 - 0.168024I$ $a = -1.82835 - 0.57508I$ $b = 1.66049 - 0.07334I$	$7.83210 - 0.83769I$	$13.30597 + 1.15346I$
$u = 0.669788 + 0.163877I$ $a = 0.71507 - 2.14236I$ $b = 0.663040 + 0.404836I$	$0.46705 + 8.25996I$	$7.57690 - 7.27704I$
$u = 0.669788 - 0.163877I$ $a = 0.71507 + 2.14236I$ $b = 0.663040 - 0.404836I$	$0.46705 - 8.25996I$	$7.57690 + 7.27704I$
$u = -1.292790 + 0.333722I$ $a = 1.42846 + 0.77075I$ $b = -1.51181 - 0.01223I$	$6.91883 + 4.02331I$	$10.59648 - 4.81859I$
$u = -1.292790 - 0.333722I$ $a = 1.42846 - 0.77075I$ $b = -1.51181 + 0.01223I$	$6.91883 - 4.02331I$	$10.59648 + 4.81859I$

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.541249 + 0.339996I$ $a = 1.76874 + 0.72750I$ $b = -0.852299 - 0.452107I$	$3.31396 - 0.27754I$	$7.89678 + 2.85778I$
$u = 0.541249 - 0.339996I$ $a = 1.76874 - 0.72750I$ $b = -0.852299 + 0.452107I$	$3.31396 + 0.27754I$	$7.89678 - 2.85778I$
$u = 1.373450 + 0.009961I$ $a = -1.80030 + 0.03203I$ $b = 1.68237 + 0.35413I$	$7.47862 - 1.37013I$	$12.04365 + 3.85494I$
$u = 1.373450 - 0.009961I$ $a = -1.80030 - 0.03203I$ $b = 1.68237 - 0.35413I$	$7.47862 + 1.37013I$	$12.04365 - 3.85494I$
$u = 1.369690 + 0.172556I$ $a = 1.53859 - 0.68713I$ $b = -1.049210 - 0.503815I$	$3.93328 + 7.99418I$	$9.34582 - 7.67512I$
$u = 1.369690 - 0.172556I$ $a = 1.53859 + 0.68713I$ $b = -1.049210 + 0.503815I$	$3.93328 - 7.99418I$	$9.34582 + 7.67512I$
$u = -0.506327 + 0.119673I$ $a = -0.46407 - 2.45760I$ $b = -0.801950 + 0.256418I$	$1.90414 - 3.01782I$	$10.46800 + 2.88141I$
$u = -0.506327 - 0.119673I$ $a = -0.46407 + 2.45760I$ $b = -0.801950 - 0.256418I$	$1.90414 + 3.01782I$	$10.46800 - 2.88141I$
$u = -1.50613 + 0.08872I$ $a = 1.46451 + 0.08379I$ $b = -1.45532 - 0.44429I$	$6.10936 + 3.03212I$	$12.42604 + 0.I$
$u = -1.50613 - 0.08872I$ $a = 1.46451 - 0.08379I$ $b = -1.45532 + 0.44429I$	$6.10936 - 3.03212I$	$12.42604 + 0.I$

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.181645 + 0.387421I$ $a = -1.59965 + 0.23831I$ $b = -1.111140 - 0.124353I$	$1.88935 + 2.33923I$	$12.63359 - 3.25124I$
$u = -0.181645 - 0.387421I$ $a = -1.59965 - 0.23831I$ $b = -1.111140 + 0.124353I$	$1.88935 - 2.33923I$	$12.63359 + 3.25124I$
$u = 0.09789 + 1.58502I$ $a = -0.478309 - 0.085728I$ $b = 1.166920 - 0.101863I$	$-2.57453 - 2.43245I$	0
$u = 0.09789 - 1.58502I$ $a = -0.478309 + 0.085728I$ $b = 1.166920 + 0.101863I$	$-2.57453 + 2.43245I$	0

### III. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$(u^{34} - 15u^{33} + \dots - 15u + 1)(u^{136} + 48u^{135} + \dots - 102u + 1)$
$c_2$	$(u^{34} - u^{33} + \dots - u + 1)(u^{136} - 2u^{135} + \dots - 16u + 1)$
$c_3$	$(u^{34} - 11u^{32} + \dots - 2u + 1)(u^{136} + u^{135} + \dots - 41455u - 52259)$
$c_4$	$(u^{34} - 3u^{33} + \dots + 5u + 1)$ $\cdot (u^{136} - 2u^{135} + \dots - 22083596u + 1331611)$
$c_5$	$(u^{34} + 10u^{32} + \dots + 2u + 1)(u^{136} + u^{135} + \dots - 159u - 29)$
$c_6$	$(u^{34} + u^{33} + \dots + u + 1)(u^{136} - 2u^{135} + \dots - 16u + 1)$
$c_7$	$(u^{34} + 4u^{33} + \dots + 12u + 1)$ $\cdot (u^{136} + 17u^{135} + \dots + 2235391u - 2280599)$
$c_8$	$(u^{34} - 2u^{33} + \dots - 14u + 1)(u^{136} - 3u^{135} + \dots - 39789u - 1637)$
$c_9$	$(u^{34} - 11u^{32} + \dots + 2u + 1)(u^{136} + u^{135} + \dots - 41455u - 52259)$
$c_{10}$	$(u^{34} - 20u^{33} + \dots - 28u + 1)(u^{136} + 57u^{135} + \dots + 15435u + 841)$
$c_{11}$	$(u^{34} + 10u^{32} + \dots - 2u + 1)(u^{136} + u^{135} + \dots - 159u - 29)$
$c_{12}$	$(u^{34} + 2u^{33} + \dots + 14u + 1)(u^{136} - 3u^{135} + \dots - 39789u - 1637)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
$c_1$	$(y^{34} + 23y^{33} + \dots + 11y + 1)(y^{136} + 96y^{135} + \dots - 15098y + 1)$
$c_2, c_6$	$(y^{34} + 15y^{33} + \dots + 15y + 1)(y^{136} + 48y^{135} + \dots - 102y + 1)$
$c_3, c_9$	$(y^{34} - 22y^{33} + \dots - 16y + 1)$ $\cdot (y^{136} - 105y^{135} + \dots + 83487901151y + 2731003081)$
$c_4$	$(y^{34} + 5y^{33} + \dots + 21y + 1)$ $\cdot (y^{136} + 42y^{135} + \dots - 67453559308704y + 1773187855321)$
$c_5, c_{11}$	$(y^{34} + 20y^{33} + \dots + 28y + 1)(y^{136} + 57y^{135} + \dots + 15435y + 841)$
$c_7$	$(y^{34} - 8y^{33} + \dots - 40y + 1)$ $\cdot (y^{136} - 51y^{135} + \dots - 522376161599385y + 5201131798801)$
$c_8, c_{12}$	$(y^{34} - 38y^{33} + \dots - 86y + 1)$ $\cdot (y^{136} - 125y^{135} + \dots - 1327455299y + 2679769)$
$c_{10}$	$(y^{34} + 4y^{33} + \dots - 64y + 1)$ $\cdot (y^{136} + 61y^{135} + \dots - 238478069y + 707281)$