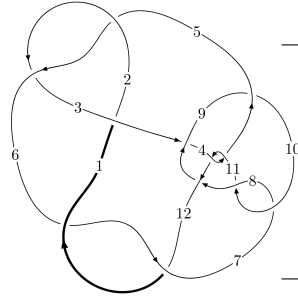
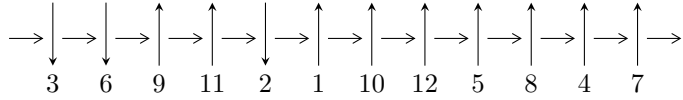


12a<sub>0399</sub> (K12a<sub>0399</sub>)



A knot diagram<sup>1</sup>

**Linearized knot diagram**



**Solving Sequence**

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

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

$$I_1^u = \langle 8.68978 \times 10^{61} u^{110} - 9.97257 \times 10^{61} u^{109} + \dots + 4.56538 \times 10^{61} b - 5.74038 \times 10^{61}, \\ 1.13849 \times 10^{61} u^{110} - 5.27519 \times 10^{61} u^{109} + \dots + 4.56538 \times 10^{61} a + 4.37740 \times 10^{61}, u^{111} - 2u^{110} + \dots - 3u^2 \rangle$$

$$I_2^u = \langle 14u^5 + 12u^4 - 6u^3 - 15u^2 + 17b - 10u - 4, 13u^5 + 16u^4 - 8u^3 - 20u^2 + 17a - 2u + 6, \\ u^6 + u^5 - u^4 - 2u^3 + u + 1 \rangle$$

\* 2 irreducible components of  $\dim_{\mathbb{C}} = 0$ , with total 117 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.

$$\mathbf{I. } I_1^u = \langle 8.69 \times 10^{61} u^{110} - 9.97 \times 10^{61} u^{109} + \dots + 4.57 \times 10^{61} b - 5.74 \times 10^{61}, 1.14 \times 10^{61} u^{110} - 5.28 \times 10^{61} u^{109} + \dots + 4.57 \times 10^{61} a + 4.38 \times 10^{61}, u^{111} - 2u^{110} + \dots - 3u^2 + 1 \rangle$$

(i) Arc colorings

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

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

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

$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} -0.249374u^{110} + 1.15548u^{109} + \dots + 1.33102u - 0.958826 \\ -1.90341u^{110} + 2.18439u^{109} + \dots + 2.65883u + 1.25737 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.372838u^{110} + 0.358652u^{109} + \dots + 0.368291u - 1.43345 \\ -1.46447u^{110} + 1.53387u^{109} + \dots + 3.34613u + 0.846984 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -2.54332u^{110} + 3.45704u^{109} + \dots + 3.89125u + 2.46522 \\ -1.84245u^{110} + 2.92307u^{109} + \dots + 1.27372u + 2.34650 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} -0.265304u^{110} - 1.25314u^{109} + \dots - 2.83145u - 2.31909 \\ -1.03887u^{110} + 0.341895u^{109} + \dots - 2.01617u - 0.317190 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1.60670u^{110} - 1.55222u^{109} + \dots - 0.323016u - 3.23798 \\ -0.0473347u^{110} - 0.523306u^{109} + \dots + 1.00479u - 1.02178 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^8 + 3u^6 - 3u^4 + 1 \\ -u^{10} + 2u^8 - u^6 - 2u^4 + u^2 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes =  $9.59749u^{110} - 11.8018u^{109} + \dots - 18.8679u - 4.76652$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1$	$u^{111} + 60u^{110} + \dots + 6u + 1$
$c_2, c_5$	$u^{111} + 2u^{110} + \dots + 3u^2 - 1$
$c_3$	$u^{111} - u^{110} + \dots - 44608u - 18496$
$c_4, c_{11}$	$u^{111} - 2u^{110} + \dots + 4u - 1$
$c_6, c_{12}$	$u^{111} + 6u^{110} + \dots - 2040u - 117$
$c_7, c_{10}$	$u^{111} + 7u^{110} + \dots - 4863u - 289$
$c_8$	$17(17u^{111} + 139u^{110} + \dots - 2325314u - 254971)$
$c_9$	$17(17u^{111} + 141u^{110} + \dots + 7037007u - 1137879)$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1$	$y^{111} - 16y^{110} + \dots - 6y - 1$
$c_2, c_5$	$y^{111} - 60y^{110} + \dots + 6y - 1$
$c_3$	$y^{111} + 39y^{110} + \dots - 3198476288y - 342102016$
$c_4, c_{11}$	$y^{111} + 60y^{110} + \dots + 6y - 1$
$c_6, c_{12}$	$y^{111} + 92y^{110} + \dots + 253098y - 13689$
$c_7, c_{10}$	$y^{111} - 59y^{110} + \dots + 5219239y - 83521$
$c_8$	$289(289y^{111} + 11857y^{110} + \dots - 7.53479 \times 10^{11}y - 6.50102 \times 10^{10})$
$c_9$	$289$ $\cdot (289y^{111} + 5823y^{110} + \dots - 12739163227479y - 1294768618641)$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.834615 + 0.535206I$	$-2.59566 - 2.01372I$	0
$a = 0.375202 - 0.459232I$		
$b = 0.987509 + 0.500262I$		
$u = 0.834615 - 0.535206I$	$-2.59566 + 2.01372I$	0
$a = 0.375202 + 0.459232I$		
$b = 0.987509 - 0.500262I$		
$u = -0.908007 + 0.440150I$	$-0.05778 + 3.59134I$	0
$a = 0.870965 - 0.756312I$		
$b = 0.345171 - 1.298790I$		
$u = -0.908007 - 0.440150I$	$-0.05778 - 3.59134I$	0
$a = 0.870965 + 0.756312I$		
$b = 0.345171 + 1.298790I$		
$u = 0.946570 + 0.255654I$	$-1.60448 - 0.97268I$	0
$a = -0.200806 + 0.059664I$		
$b = 0.108262 + 0.411566I$		
$u = 0.946570 - 0.255654I$	$-1.60448 + 0.97268I$	0
$a = -0.200806 - 0.059664I$		
$b = 0.108262 - 0.411566I$		
$u = -0.834031 + 0.470284I$	$1.48070 + 5.11628I$	0
$a = 0.39107 - 1.63417I$		
$b = -0.31447 - 2.37348I$		
$u = -0.834031 - 0.470284I$	$1.48070 - 5.11628I$	0
$a = 0.39107 + 1.63417I$		
$b = -0.31447 + 2.37348I$		
$u = 0.922985 + 0.492254I$	$-3.52013 - 7.01110I$	0
$a = -1.51818 - 0.60021I$		
$b = -1.40133 - 1.55983I$		
$u = 0.922985 - 0.492254I$	$-3.52013 + 7.01110I$	0
$a = -1.51818 + 0.60021I$		
$b = -1.40133 + 1.55983I$		

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.047250 + 0.044475I$ $a = 0.292931 + 0.818809I$ $b = -0.10216 + 1.96682I$	$-6.58005 - 2.08256I$	0
$u = -1.047250 - 0.044475I$ $a = 0.292931 - 0.818809I$ $b = -0.10216 - 1.96682I$	$-6.58005 + 2.08256I$	0
$u = -0.859614 + 0.351206I$ $a = 1.57761 - 3.31213I$ $b = -4.08024 - 4.07942I$	$-0.35301 + 1.43124I$	$0. - 47.2768I$
$u = -0.859614 - 0.351206I$ $a = 1.57761 + 3.31213I$ $b = -4.08024 + 4.07942I$	$-0.35301 - 1.43124I$	$0. + 47.2768I$
$u = 0.922542 + 0.577717I$ $a = 0.748820 + 0.420068I$ $b = 0.41068 + 1.81613I$	$-0.01792 - 12.83630I$	0
$u = 0.922542 - 0.577717I$ $a = 0.748820 - 0.420068I$ $b = 0.41068 - 1.81613I$	$-0.01792 + 12.83630I$	0
$u = -0.910545 + 0.597585I$ $a = -0.421795 + 0.262582I$ $b = -0.224428 + 1.279370I$	$3.46581 + 6.78260I$	0
$u = -0.910545 - 0.597585I$ $a = -0.421795 - 0.262582I$ $b = -0.224428 - 1.279370I$	$3.46581 - 6.78260I$	0
$u = 0.792090 + 0.442544I$ $a = 0.512881 - 0.924083I$ $b = 0.39332 - 1.55392I$	$2.67871 - 1.96737I$	0
$u = 0.792090 - 0.442544I$ $a = 0.512881 + 0.924083I$ $b = 0.39332 + 1.55392I$	$2.67871 + 1.96737I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.613109 + 0.665430I$ $a = 0.692454 - 0.212166I$ $b = -0.350298 - 0.262501I$	$4.33033 - 1.91604I$	0
$u = -0.613109 - 0.665430I$ $a = 0.692454 + 0.212166I$ $b = -0.350298 + 0.262501I$	$4.33033 + 1.91604I$	0
$u = 0.756067 + 0.438627I$ $a = 1.31896 - 0.63494I$ $b = 0.620894 - 0.741219I$	$2.78293 - 1.81354I$	$11.47406 + 5.81241I$
$u = 0.756067 - 0.438627I$ $a = 1.31896 + 0.63494I$ $b = 0.620894 + 0.741219I$	$2.78293 + 1.81354I$	$11.47406 - 5.81241I$
$u = -1.134190 + 0.049687I$ $a = 0.682870 + 0.550231I$ $b = 1.18470 + 1.53148I$	$-4.57094 + 7.52155I$	0
$u = -1.134190 - 0.049687I$ $a = 0.682870 - 0.550231I$ $b = 1.18470 - 1.53148I$	$-4.57094 - 7.52155I$	0
$u = 0.072095 + 0.859373I$ $a = -0.928042 - 0.252441I$ $b = -0.130706 - 0.452834I$	$-6.15310 - 1.82221I$	$1.55519 + 4.05739I$
$u = 0.072095 - 0.859373I$ $a = -0.928042 + 0.252441I$ $b = -0.130706 + 0.452834I$	$-6.15310 + 1.82221I$	$1.55519 - 4.05739I$
$u = 0.575345 + 0.641837I$ $a = -1.155040 - 0.439574I$ $b = 0.443919 - 0.568552I$	$0.97421 + 8.10105I$	$7.90130 - 5.08491I$
$u = 0.575345 - 0.641837I$ $a = -1.155040 + 0.439574I$ $b = 0.443919 + 0.568552I$	$0.97421 - 8.10105I$	$7.90130 + 5.08491I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.148173 + 0.848261I$ $a = -2.14461 - 0.47597I$ $b = -0.632480 + 0.223096I$	$-0.67070 - 7.63508I$	$7.39583 + 5.40933I$
$u = -0.148173 - 0.848261I$ $a = -2.14461 + 0.47597I$ $b = -0.632480 - 0.223096I$	$-0.67070 + 7.63508I$	$7.39583 - 5.40933I$
$u = 1.134030 + 0.110191I$ $a = -0.468579 + 0.465411I$ $b = -0.619619 + 1.146050I$	$-1.61397 - 1.69001I$	0
$u = 1.134030 - 0.110191I$ $a = -0.468579 - 0.465411I$ $b = -0.619619 - 1.146050I$	$-1.61397 + 1.69001I$	0
$u = 0.136956 + 0.849470I$ $a = 2.66559 - 0.79648I$ $b = 0.781787 + 0.266546I$	$-4.24399 + 13.44080I$	$4.60655 - 7.44035I$
$u = 0.136956 - 0.849470I$ $a = 2.66559 + 0.79648I$ $b = 0.781787 - 0.266546I$	$-4.24399 - 13.44080I$	$4.60655 + 7.44035I$
$u = 0.849419 + 0.110125I$ $a = 0.96130 - 1.04057I$ $b = 2.04338 - 0.43107I$	$-1.53260 - 2.25831I$	$0. + 3.30234I$
$u = 0.849419 - 0.110125I$ $a = 0.96130 + 1.04057I$ $b = 2.04338 + 0.43107I$	$-1.53260 + 2.25831I$	$0. - 3.30234I$
$u = 1.001650 + 0.562088I$ $a = -0.813131 + 0.346744I$ $b = -1.46484 + 0.18792I$	$-0.98280 + 1.31925I$	0
$u = 1.001650 - 0.562088I$ $a = -0.813131 - 0.346744I$ $b = -1.46484 - 0.18792I$	$-0.98280 - 1.31925I$	0



Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.409158 + 0.743401I$ $a = -0.171239 + 0.839413I$ $b = 0.065651 + 0.169393I$	$3.36317 - 0.41806I$	$3.60069 - 8.61246I$
$u = -0.409158 - 0.743401I$ $a = -0.171239 - 0.839413I$ $b = 0.065651 - 0.169393I$	$3.36317 + 0.41806I$	$3.60069 + 8.61246I$
$u = 0.151823 + 0.816435I$ $a = 2.09192 + 0.59720I$ $b = 0.446118 + 0.412258I$	$-5.92471 + 2.62368I$	$1.84988 - 3.69517I$
$u = 0.151823 - 0.816435I$ $a = 2.09192 - 0.59720I$ $b = 0.446118 - 0.412258I$	$-5.92471 - 2.62368I$	$1.84988 + 3.69517I$
$u = 0.096912 + 0.821896I$ $a = -2.11840 + 0.22879I$ $b = -0.700414 - 0.643209I$	$-7.33687 + 6.64836I$	$1.77591 - 5.17753I$
$u = 0.096912 - 0.821896I$ $a = -2.11840 - 0.22879I$ $b = -0.700414 + 0.643209I$	$-7.33687 - 6.64836I$	$1.77591 + 5.17753I$
$u = 0.473451 + 0.670363I$ $a = -0.188811 + 1.380070I$ $b = -0.374975 + 0.164741I$	$0.53348 - 6.07102I$	$7.48092 + 6.72724I$
$u = 0.473451 - 0.670363I$ $a = -0.188811 - 1.380070I$ $b = -0.374975 - 0.164741I$	$0.53348 + 6.07102I$	$7.48092 - 6.72724I$
$u = -0.073132 + 0.817180I$ $a = 1.55186 + 0.54914I$ $b = 0.541244 - 0.302568I$	$-3.58815 - 2.70699I$	$4.59482 + 2.37332I$
$u = -0.073132 - 0.817180I$ $a = 1.55186 - 0.54914I$ $b = 0.541244 + 0.302568I$	$-3.58815 + 2.70699I$	$4.59482 - 2.37332I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.684067 + 0.439055I$ $a = -2.23694 - 0.06823I$ $b = -0.985617 + 0.441946I$	$1.91731 - 1.22530I$	$11.04588 + 1.99342I$
$u = -0.684067 - 0.439055I$ $a = -2.23694 + 0.06823I$ $b = -0.985617 - 0.441946I$	$1.91731 + 1.22530I$	$11.04588 - 1.99342I$
$u = -0.033204 + 0.769484I$ $a = 5.08904 + 3.02969I$ $b = 1.127060 + 0.656234I$	$-2.86008 - 0.10900I$	$9.84258 - 2.55547I$
$u = -0.033204 - 0.769484I$ $a = 5.08904 - 3.02969I$ $b = 1.127060 - 0.656234I$	$-2.86008 + 0.10900I$	$9.84258 + 2.55547I$
$u = -1.084640 + 0.583143I$ $a = 0.574630 - 0.107911I$ $b = 0.946178 - 0.226442I$	$1.38553 + 5.44700I$	0
$u = -1.084640 - 0.583143I$ $a = 0.574630 + 0.107911I$ $b = 0.946178 + 0.226442I$	$1.38553 - 5.44700I$	0
$u = 0.611298 + 0.456973I$ $a = 0.216368 - 1.032910I$ $b = 0.951362 + 0.081774I$	$-2.07546 - 2.11658I$	$4.00495 + 2.98042I$
$u = 0.611298 - 0.456973I$ $a = 0.216368 + 1.032910I$ $b = 0.951362 - 0.081774I$	$-2.07546 + 2.11658I$	$4.00495 - 2.98042I$
$u = -0.094700 + 0.755700I$ $a = 1.71110 + 0.94562I$ $b = 1.149410 + 0.270931I$	$-1.24302 - 4.87688I$	$6.15872 + 7.36426I$
$u = -0.094700 - 0.755700I$ $a = 1.71110 - 0.94562I$ $b = 1.149410 - 0.270931I$	$-1.24302 + 4.87688I$	$6.15872 - 7.36426I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.167110 + 0.447186I$ $a = 0.059015 - 1.247870I$ $b = -0.82878 - 1.64052I$	$-2.27607 + 2.52785I$	0
$u = -1.167110 - 0.447186I$ $a = 0.059015 + 1.247870I$ $b = -0.82878 + 1.64052I$	$-2.27607 - 2.52785I$	0
$u = 1.186580 + 0.414234I$ $a = -0.26976 - 1.91118I$ $b = -0.65215 - 2.05390I$	$-4.92588 + 0.84899I$	0
$u = 1.186580 - 0.414234I$ $a = -0.26976 + 1.91118I$ $b = -0.65215 + 2.05390I$	$-4.92588 - 0.84899I$	0
$u = -1.181480 + 0.432048I$ $a = 0.08317 - 2.05447I$ $b = -0.07886 - 2.71531I$	$-3.05777 + 2.55271I$	0
$u = -1.181480 - 0.432048I$ $a = 0.08317 + 2.05447I$ $b = -0.07886 + 2.71531I$	$-3.05777 - 2.55271I$	0
$u = 1.171300 + 0.465621I$ $a = -0.262232 + 0.143007I$ $b = 0.634808 + 0.005375I$	$-2.13515 - 5.82401I$	0
$u = 1.171300 - 0.465621I$ $a = -0.262232 - 0.143007I$ $b = 0.634808 - 0.005375I$	$-2.13515 + 5.82401I$	0
$u = 0.065295 + 0.728847I$ $a = -1.74544 - 0.09492I$ $b = -0.830463 + 0.399357I$	$0.45155 + 1.53825I$	$9.48415 - 0.44881I$
$u = 0.065295 - 0.728847I$ $a = -1.74544 + 0.09492I$ $b = -0.830463 - 0.399357I$	$0.45155 - 1.53825I$	$9.48415 + 0.44881I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.182730 + 0.474899I$ $a = -0.39732 + 1.60339I$ $b = 0.06979 + 2.13006I$	$-2.74783 - 5.99194I$	0
$u = 1.182730 - 0.474899I$ $a = -0.39732 - 1.60339I$ $b = 0.06979 - 2.13006I$	$-2.74783 + 5.99194I$	0
$u = -1.219700 + 0.371465I$ $a = 0.50263 + 1.57686I$ $b = 0.15018 + 2.65967I$	$-10.07290 + 1.36463I$	0
$u = -1.219700 - 0.371465I$ $a = 0.50263 - 1.57686I$ $b = 0.15018 - 2.65967I$	$-10.07290 - 1.36463I$	0
$u = 1.199800 + 0.440822I$ $a = -2.19421 - 3.51627I$ $b = -3.96032 - 5.37523I$	$-6.43194 - 4.18755I$	0
$u = 1.199800 - 0.440822I$ $a = -2.19421 + 3.51627I$ $b = -3.96032 + 5.37523I$	$-6.43194 + 4.18755I$	0
$u = -1.186700 + 0.486566I$ $a = 0.98713 + 2.09189I$ $b = 1.23768 + 2.59947I$	$-4.41124 + 9.46317I$	0
$u = -1.186700 - 0.486566I$ $a = 0.98713 - 2.09189I$ $b = 1.23768 - 2.59947I$	$-4.41124 - 9.46317I$	0
$u = -1.198340 + 0.467259I$ $a = 1.54747 + 4.75010I$ $b = 1.94702 + 7.94556I$	$-6.24285 + 4.59853I$	0
$u = -1.198340 - 0.467259I$ $a = 1.54747 - 4.75010I$ $b = 1.94702 - 7.94556I$	$-6.24285 - 4.59853I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.225740 + 0.404164I$ $a = -0.310727 - 1.348810I$ $b = 0.59931 - 2.01057I$	$-11.31140 - 2.41858I$	0
$u = -1.225740 - 0.404164I$ $a = -0.310727 + 1.348810I$ $b = 0.59931 + 2.01057I$	$-11.31140 + 2.41858I$	0
$u = 1.240030 + 0.368039I$ $a = 0.16809 + 1.52440I$ $b = 0.96807 + 2.28237I$	$-4.95179 + 3.52392I$	0
$u = 1.240030 - 0.368039I$ $a = 0.16809 - 1.52440I$ $b = 0.96807 - 2.28237I$	$-4.95179 - 3.52392I$	0
$u = 1.225170 + 0.418267I$ $a = -0.035968 - 1.055780I$ $b = -0.77728 - 1.52376I$	$-7.46544 - 1.60252I$	0
$u = 1.225170 - 0.418267I$ $a = -0.035968 + 1.055780I$ $b = -0.77728 + 1.52376I$	$-7.46544 + 1.60252I$	0
$u = -1.242340 + 0.376296I$ $a = -0.39829 + 1.84552I$ $b = -1.52361 + 2.72383I$	$-8.48648 - 9.27237I$	0
$u = -1.242340 - 0.376296I$ $a = -0.39829 - 1.84552I$ $b = -1.52361 - 2.72383I$	$-8.48648 + 9.27237I$	0
$u = 0.487292 + 0.497011I$ $a = 1.31420 + 1.39855I$ $b = 0.097562 + 0.891708I$	$-2.35922 + 2.92531I$	$4.93460 - 2.97763I$
$u = 0.487292 - 0.497011I$ $a = 1.31420 - 1.39855I$ $b = 0.097562 - 0.891708I$	$-2.35922 - 2.92531I$	$4.93460 + 2.97763I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.196470 + 0.520819I$ $a = -0.70602 - 1.78842I$ $b = -1.01996 - 2.82973I$	$-9.01307 - 7.53686I$	0
$u = 1.196470 - 0.520819I$ $a = -0.70602 + 1.78842I$ $b = -1.01996 + 2.82973I$	$-9.01307 + 7.53686I$	0
$u = -1.211100 + 0.489866I$ $a = 0.13518 + 1.72594I$ $b = 0.52771 + 2.53911I$	$-6.95115 + 7.44961I$	0
$u = -1.211100 - 0.489866I$ $a = 0.13518 - 1.72594I$ $b = 0.52771 - 2.53911I$	$-6.95115 - 7.44961I$	0
$u = 1.209200 + 0.499490I$ $a = 0.34195 + 2.22331I$ $b = -0.00360 + 3.25080I$	$-10.6314 - 11.4594I$	0
$u = 1.209200 - 0.499490I$ $a = 0.34195 - 2.22331I$ $b = -0.00360 - 3.25080I$	$-10.6314 + 11.4594I$	0
$u = -1.247010 + 0.417146I$ $a = -0.386749 - 0.568967I$ $b = -0.020014 - 1.127550I$	$-10.17840 + 6.27369I$	0
$u = -1.247010 - 0.417146I$ $a = -0.386749 + 0.568967I$ $b = -0.020014 + 1.127550I$	$-10.17840 - 6.27369I$	0
$u = -1.208710 + 0.525173I$ $a = -0.11494 - 2.07415I$ $b = -0.34802 - 3.19996I$	$-3.83617 + 12.64810I$	0
$u = -1.208710 - 0.525173I$ $a = -0.11494 + 2.07415I$ $b = -0.34802 + 3.19996I$	$-3.83617 - 12.64810I$	0

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.211700 + 0.521330I$ $a = 0.26134 - 2.56449I$ $b = 0.65968 - 3.97940I$	$-7.4521 - 18.4366I$	0
$u = 1.211700 - 0.521330I$ $a = 0.26134 + 2.56449I$ $b = 0.65968 + 3.97940I$	$-7.4521 + 18.4366I$	0
$u = 1.228900 + 0.494017I$ $a = 0.440809 + 0.916961I$ $b = 0.35173 + 1.46927I$	$-9.62629 - 3.05742I$	0
$u = 1.228900 - 0.494017I$ $a = 0.440809 - 0.916961I$ $b = 0.35173 - 1.46927I$	$-9.62629 + 3.05742I$	0
$u = 0.050741 + 0.672914I$ $a = -0.426694 - 0.829633I$ $b = -0.390008 + 0.690859I$	$1.00384 + 1.53449I$	$9.06398 - 3.66873I$
$u = 0.050741 - 0.672914I$ $a = -0.426694 + 0.829633I$ $b = -0.390008 - 0.690859I$	$1.00384 - 1.53449I$	$9.06398 + 3.66873I$
$u = -0.560641 + 0.291332I$ $a = -1.42054 + 0.18920I$ $b = -0.660713 + 0.576041I$	$0.930968 - 0.039487I$	$11.38983 + 0.48618I$
$u = -0.560641 - 0.291332I$ $a = -1.42054 - 0.18920I$ $b = -0.660713 - 0.576041I$	$0.930968 + 0.039487I$	$11.38983 - 0.48618I$
$u = -0.535332$ $a = -1.76526$ $b = -0.957282$	0.895049	11.9250
$u = -0.182707 + 0.342215I$ $a = -1.36709 - 2.30419I$ $b = -0.424404 + 0.710330I$	$1.02805 + 1.15491I$	$7.92536 - 0.29840I$

Solutions to $I_1^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.182707 - 0.342215I$		
$a = -1.36709 + 2.30419I$	$1.02805 - 1.15491I$	$7.92536 + 0.29840I$
$b = -0.424404 - 0.710330I$		



$$\text{II. } I_2^u = \langle 14u^5 + 12u^4 - 6u^3 - 15u^2 + 17b - 10u - 4, 13u^5 + 16u^4 - 8u^3 - 20u^2 + 17a - 2u + 6, u^6 + u^5 - u^4 - 2u^3 + u + 1 \rangle$$

(i) Arc colorings

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

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

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

$$a_1 = \begin{pmatrix} -u^2 + 1 \\ -u^4 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} u^5 - 2u^3 + u \\ u^5 + u^4 - 2u^3 - u^2 + u + 1 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.764706u^5 - 0.941176u^4 + \dots + 0.117647u - 0.352941 \\ -0.823529u^5 - 0.705882u^4 + \dots + 0.588235u + 0.235294 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} 0.235294u^5 - 0.941176u^4 + \dots + 1.11765u - 0.352941 \\ 0.176471u^5 + 0.294118u^4 + \dots + 1.58824u + 1.23529 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -u^5 + 2u^3 - u \\ -u^5 - u^4 + 2u^3 + u^2 - u - 1 \end{pmatrix}$$

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

$$a_4 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} -0.294118u^5 - 0.823529u^4 + \dots + 0.352941u - 0.0588235 \\ -0.352941u^5 - 0.588235u^4 + \dots + 0.823529u + 0.529412 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -2u^5 + 3u^3 - 2u \\ -2u^5 - 2u^4 + 3u^3 + 2u^2 - u - 2 \end{pmatrix}$$

(ii) Obstruction class = 1

$$\text{(iii) Cusp Shapes} = \frac{1033}{289}u^5 + \frac{1801}{289}u^4 - \frac{2269}{289}u^3 - \frac{1975}{289}u^2 + \frac{236}{289}u + \frac{4120}{289}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
$c_1, c_6$	$u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1$
$c_2, c_4$	$u^6 + u^5 - u^4 - 2u^3 + u + 1$
$c_3$	$u^6$
$c_5, c_{11}$	$u^6 - u^5 - u^4 + 2u^3 - u + 1$
$c_7$	$(u + 1)^6$
$c_8$	$17(17u^6 + 58u^5 + 89u^4 + 74u^3 + 35u^2 + 9u + 1)$
$c_9$	$17(17u^6 + 28u^5 + 4u^4 - 15u^3 - 6u^2 + 2u + 1)$
$c_{10}$	$(u - 1)^6$
$c_{12}$	$u^6 + 3u^5 + 5u^4 + 4u^3 + 2u^2 + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
$c_1, c_6, c_{12}$	$y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1$
$c_2, c_4, c_5$ $c_{11}$	$y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1$
$c_3$	$y^6$
$c_7, c_{10}$	$(y - 1)^6$
$c_8$	$289(289y^6 - 338y^5 + 527y^4 - 256y^3 + 71y^2 - 11y + 1)$
$c_9$	$289(289y^6 - 648y^5 + 652y^4 - 351y^3 + 104y^2 - 16y + 1)$

(vi) Complex Volumes and Cusp Shapes

Solutions to $I_2^u$	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.002190 + 0.295542I$		
$a = 0.602693 - 0.827374I$	$-0.245672 - 0.924305I$	$6.62801 + 0.58456I$
$b = 1.41061 - 0.78118I$		
$u = 1.002190 - 0.295542I$		
$a = 0.602693 + 0.827374I$	$-0.245672 + 0.924305I$	$6.62801 - 0.58456I$
$b = 1.41061 + 0.78118I$		
$u = -0.428243 + 0.664531I$		
$a = -0.169822 - 0.607111I$	$3.53554 - 0.92430I$	$9.92560 + 4.63647I$
$b = 0.179799 - 0.048858I$		
$u = -0.428243 - 0.664531I$		
$a = -0.169822 + 0.607111I$	$3.53554 + 0.92430I$	$9.92560 - 4.63647I$
$b = 0.179799 + 0.048858I$		
$u = -1.073950 + 0.558752I$		
$a = -0.374048 + 0.036748I$	$1.64493 + 5.69302I$	$11.7370 - 11.4468I$
$b = -0.796289 - 0.132787I$		
$u = -1.073950 - 0.558752I$		
$a = -0.374048 - 0.036748I$	$1.64493 - 5.69302I$	$11.7370 + 11.4468I$
$b = -0.796289 + 0.132787I$		

### III. u-Polynomials

Crossings	u-Polynomials at each crossing
$c_1$	$(u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)(u^{111} + 60u^{110} + \dots + 6u + 1)$
$c_2$	$(u^6 + u^5 - u^4 - 2u^3 + u + 1)(u^{111} + 2u^{110} + \dots + 3u^2 - 1)$
$c_3$	$u^6(u^{111} - u^{110} + \dots - 44608u - 18496)$
$c_4$	$(u^6 + u^5 - u^4 - 2u^3 + u + 1)(u^{111} - 2u^{110} + \dots + 4u - 1)$
$c_5$	$(u^6 - u^5 - u^4 + 2u^3 - u + 1)(u^{111} + 2u^{110} + \dots + 3u^2 - 1)$
$c_6$	$(u^6 - 3u^5 + 5u^4 - 4u^3 + 2u^2 - u + 1)(u^{111} + 6u^{110} + \dots - 2040u - 117)$
$c_7$	$((u + 1)^6)(u^{111} + 7u^{110} + \dots - 4863u - 289)$
$c_8$	$289(17u^6 + 58u^5 + 89u^4 + 74u^3 + 35u^2 + 9u + 1)$ $\cdot (17u^{111} + 139u^{110} + \dots - 2325314u - 254971)$
$c_9$	$289(17u^6 + 28u^5 + 4u^4 - 15u^3 - 6u^2 + 2u + 1)$ $\cdot (17u^{111} + 141u^{110} + \dots + 7037007u - 1137879)$
$c_{10}$	$((u - 1)^6)(u^{111} + 7u^{110} + \dots - 4863u - 289)$
$c_{11}$	$(u^6 - u^5 - u^4 + 2u^3 - u + 1)(u^{111} - 2u^{110} + \dots + 4u - 1)$
$c_{12}$	$(u^6 + 3u^5 + 5u^4 + 4u^3 + 2u^2 + u + 1)(u^{111} + 6u^{110} + \dots - 2040u - 117)$

#### IV. Riley Polynomials

Crossings	Riley Polynomials at each crossing
$c_1$	$(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)(y^{111} - 16y^{110} + \dots - 6y - 1)$
$c_2, c_5$	$(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)(y^{111} - 60y^{110} + \dots + 6y - 1)$
$c_3$	$y^6(y^{111} + 39y^{110} + \dots - 3.19848 \times 10^9 y - 3.42102 \times 10^8)$
$c_4, c_{11}$	$(y^6 - 3y^5 + 5y^4 - 4y^3 + 2y^2 - y + 1)(y^{111} + 60y^{110} + \dots + 6y - 1)$
$c_6, c_{12}$	$(y^6 + y^5 + 5y^4 + 6y^2 + 3y + 1)(y^{111} + 92y^{110} + \dots + 253098y - 13689)$
$c_7, c_{10}$	$((y - 1)^6)(y^{111} - 59y^{110} + \dots + 5219239y - 83521)$
$c_8$	$83521(289y^6 - 338y^5 + 527y^4 - 256y^3 + 71y^2 - 11y + 1)$ $\cdot (289y^{111} + 11857y^{110} + \dots - 753479228508y - 65010210841)$
$c_9$	$83521(289y^6 - 648y^5 + 652y^4 - 351y^3 + 104y^2 - 16y + 1)$ $\cdot (289y^{111} + 5823y^{110} + \dots - 12739163227479y - 1294768618641)$