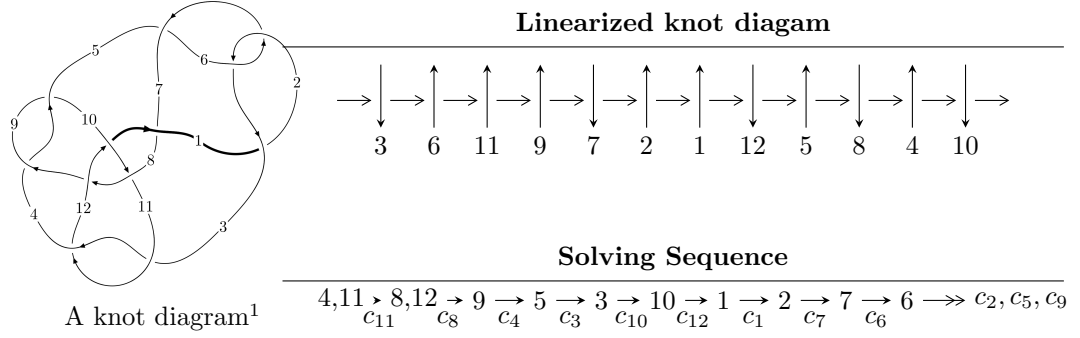


12a₀₄₇₈ (K12a₀₄₇₈)



Ideals for irreducible components² of X_{par}

$$\begin{aligned}
 I_1^u &= \langle 5.33641 \times 10^{28} u^{43} - 9.09644 \times 10^{28} u^{42} + \dots + 3.03461 \times 10^{30} b + 1.66297 \times 10^{30}, \\
 &\quad 4.33477 \times 10^{29} u^{43} - 4.31353 \times 10^{28} u^{42} + \dots + 3.03461 \times 10^{30} a - 1.76199 \times 10^{30}, u^{44} - u^{43} + \dots + u + 1 \rangle \\
 I_2^u &= \langle 7.99621 \times 10^{275} u^{83} + 1.94730 \times 10^{276} u^{82} + \dots + 8.94216 \times 10^{276} b - 2.93848 \times 10^{279}, \\
 &\quad - 2.61794 \times 10^{279} u^{83} - 6.34847 \times 10^{279} u^{82} + \dots + 2.66745 \times 10^{280} a + 7.68018 \times 10^{282}, \\
 &\quad u^{84} + u^{83} + \dots + 1700u + 2983 \rangle \\
 I_3^u &= \langle -u^2 + b + 1, u^{20} - u^{19} + \dots + a + 2, u^{21} - u^{20} + \dots - 3u + 1 \rangle
 \end{aligned}$$

* 3 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 149 representations.

¹The 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>).

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

I.

$$I_1^u = \langle 5.34 \times 10^{28} u^{43} - 9.10 \times 10^{28} u^{42} + \dots + 3.03 \times 10^{30} b + 1.66 \times 10^{30}, 4.33 \times 10^{29} u^{43} - 4.31 \times 10^{28} u^{42} + \dots + 3.03 \times 10^{30} a - 1.76 \times 10^{30}, u^{44} - u^{43} + \dots + u + 1 \rangle$$

(i) Arc colorings

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

$$a_{11} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_8 = \begin{pmatrix} -0.142844u^{43} + 0.0142144u^{42} + \dots + 1.40262u + 0.580630 \\ -0.0175851u^{43} + 0.0299756u^{42} + \dots + 1.13114u - 0.548000 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 1 \\ -u^2 \end{pmatrix}$$

$$a_9 = \begin{pmatrix} 1 \\ -0.142844u^{43} + 0.0142144u^{42} + \dots + 1.40262u - 0.419370 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} u \\ -0.128630u^{43} + 0.00337070u^{42} + \dots + 0.723474u + 0.142844 \end{pmatrix}$$

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

$$a_{10} = \begin{pmatrix} -u^2 + 1 \\ -0.0175851u^{43} + 0.0299756u^{42} + \dots + 1.13114u - 0.548000 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.000908052u^{43} + 0.108043u^{42} + \dots + 1.12595u + 0.464391 \\ -0.0217088u^{43} + 0.0957979u^{42} + \dots - 1.02492u + 0.655135 \end{pmatrix}$$

$$a_2 = \begin{pmatrix} -0.0789830u^{43} + 0.152702u^{42} + \dots + 1.28456u + 0.645614 \\ 0.0563662u^{43} + 0.0511385u^{42} + \dots - 1.18352u + 0.473911 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -0.0789830u^{43} + 0.152702u^{42} + \dots + 1.28456u + 0.645614 \\ -0.0516465u^{43} - 0.106716u^{42} + \dots + 1.17971u - 0.547530 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} -0.234445u^{43} + 0.296776u^{42} + \dots + 0.343682u + 0.0836407 \\ 0.219664u^{43} - 0.477705u^{42} + \dots + 1.35750u + 0.331150 \end{pmatrix}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $-0.438894u^{43} - 1.56601u^{42} + \dots + 5.58366u + 2.74109$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{44} + 14u^{43} + \dots + 4u + 16$
c_2, c_6	$u^{44} - 6u^{43} + \dots - 2u - 4$
c_3, c_4, c_9 c_{11}	$u^{44} - u^{43} + \dots + u + 1$
c_7	$u^{44} + 30u^{43} + \dots - 88022u - 6988$
c_8	$u^{44} + 40u^{43} + \dots - 42991616u - 2097152$
c_{10}, c_{12}	$u^{44} + 2u^{43} + \dots + 7u - 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{44} + 30y^{43} + \dots + 9744y + 256$
c_2, c_6	$y^{44} + 14y^{43} + \dots + 4y + 16$
c_3, c_4, c_9 c_{11}	$y^{44} - 31y^{43} + \dots + y + 1$
c_7	$y^{44} + 6y^{43} + \dots + 106960964y + 48832144$
c_8	$y^{44} - 2y^{43} + \dots - 7696581394432y + 4398046511104$
c_{10}, c_{12}	$y^{44} - 10y^{43} + \dots - 37y + 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.963533 + 0.350253I$ $a = 0.86851 + 1.90330I$ $b = 0.453390 - 0.216435I$	$3.18342 + 3.22741I$	$0.25538 - 6.57497I$
$u = 0.963533 - 0.350253I$ $a = 0.86851 - 1.90330I$ $b = 0.453390 + 0.216435I$	$3.18342 - 3.22741I$	$0.25538 + 6.57497I$
$u = -1.022440 + 0.093582I$ $a = -0.935498 + 0.358789I$ $b = -1.034400 - 0.192161I$	$-1.47417 - 3.43532I$	$0.66881 + 5.03721I$
$u = -1.022440 - 0.093582I$ $a = -0.935498 - 0.358789I$ $b = -1.034400 + 0.192161I$	$-1.47417 + 3.43532I$	$0.66881 - 5.03721I$
$u = 1.05616$ $a = -1.31524$ $b = -0.848120$	2.23451	3.56780
$u = -0.980841 + 0.478403I$ $a = 0.65210 - 1.59072I$ $b = 0.666848 + 0.187542I$	$1.53255 - 8.57516I$	$0.51722 + 9.73471I$
$u = -0.980841 - 0.478403I$ $a = 0.65210 + 1.59072I$ $b = 0.666848 - 0.187542I$	$1.53255 + 8.57516I$	$0.51722 - 9.73471I$
$u = 1.139270 + 0.093898I$ $a = -1.058050 - 0.808186I$ $b = -0.866999 + 0.460040I$	$6.02381 + 3.30020I$	$7.56096 - 4.45656I$
$u = 1.139270 - 0.093898I$ $a = -1.058050 + 0.808186I$ $b = -0.866999 - 0.460040I$	$6.02381 - 3.30020I$	$7.56096 + 4.45656I$
$u = -1.143130 + 0.125355I$ $a = -0.938693 + 0.792091I$ $b = -0.953820 - 0.499545I$	$4.99041 - 9.37474I$	$6.29693 + 8.40216I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.143130 - 0.125355I$ $a = -0.938693 - 0.792091I$ $b = -0.953820 + 0.499545I$	$4.99041 + 9.37474I$	$6.29693 - 8.40216I$
$u = 0.217696 + 0.819184I$ $a = 0.152694 - 0.527270I$ $b = -0.940135 - 0.910573I$	$-0.52383 - 7.78712I$	$0.00351 + 6.35147I$
$u = 0.217696 - 0.819184I$ $a = 0.152694 + 0.527270I$ $b = -0.940135 + 0.910573I$	$-0.52383 + 7.78712I$	$0.00351 - 6.35147I$
$u = -0.688920 + 0.451970I$ $a = 1.02687 - 1.08790I$ $b = 0.426757 - 0.154326I$	$-2.73346 - 2.08740I$	$-3.07292 + 2.85449I$
$u = -0.688920 - 0.451970I$ $a = 1.02687 + 1.08790I$ $b = 0.426757 + 0.154326I$	$-2.73346 + 2.08740I$	$-3.07292 - 2.85449I$
$u = -0.176839 + 0.789101I$ $a = 0.180681 + 0.508444I$ $b = -0.854363 + 0.859568I$	$0.40669 + 2.26076I$	$1.58718 - 1.55987I$
$u = -0.176839 - 0.789101I$ $a = 0.180681 - 0.508444I$ $b = -0.854363 - 0.859568I$	$0.40669 - 2.26076I$	$1.58718 + 1.55987I$
$u = 0.308970 + 0.711810I$ $a = 0.086084 - 0.461553I$ $b = -1.081530 - 0.689213I$	$-5.25526 - 2.25847I$	$-6.26530 + 1.17443I$
$u = 0.308970 - 0.711810I$ $a = 0.086084 + 0.461553I$ $b = -1.081530 + 0.689213I$	$-5.25526 + 2.25847I$	$-6.26530 - 1.17443I$
$u = -0.364868 + 0.635114I$ $a = 0.660022 - 0.672984I$ $b = 0.150292 - 0.548954I$	$0.83408 + 3.47441I$	$2.06056 - 1.25791I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.364868 - 0.635114I$ $a = 0.660022 + 0.672984I$ $b = 0.150292 + 0.548954I$	$0.83408 - 3.47441I$	$2.06056 + 1.25791I$
$u = 0.457923 + 0.566781I$ $a = -0.044360 - 0.398417I$ $b = -1.256120 - 0.419833I$	$-2.07652 + 3.22600I$	$-0.64383 - 7.61023I$
$u = 0.457923 - 0.566781I$ $a = -0.044360 + 0.398417I$ $b = -1.256120 + 0.419833I$	$-2.07652 - 3.22600I$	$-0.64383 + 7.61023I$
$u = 0.236575 + 0.631412I$ $a = 0.581720 + 0.550322I$ $b = -0.054507 + 0.565134I$	$1.51179 + 1.75801I$	$3.42715 - 4.74250I$
$u = 0.236575 - 0.631412I$ $a = 0.581720 - 0.550322I$ $b = -0.054507 - 0.565134I$	$1.51179 - 1.75801I$	$3.42715 + 4.74250I$
$u = 0.645516$ $a = 2.06097$ $b = 0.202182$	1.23926	13.0470
$u = 1.348290 + 0.336035I$ $a = -0.06962 + 1.61677I$ $b = 0.514106 - 1.076690I$	$11.66130 + 2.70389I$	0
$u = 1.348290 - 0.336035I$ $a = -0.06962 - 1.61677I$ $b = 0.514106 + 1.076690I$	$11.66130 - 2.70389I$	0
$u = -0.461955 + 0.387848I$ $a = -0.104836 + 0.279406I$ $b = -1.198360 + 0.224243I$	$-1.42861 + 1.53127I$	$2.46911 + 4.30137I$
$u = -0.461955 - 0.387848I$ $a = -0.104836 - 0.279406I$ $b = -1.198360 - 0.224243I$	$-1.42861 - 1.53127I$	$2.46911 - 4.30137I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.31771 + 0.52143I$ $a = 0.13723 + 1.49979I$ $b = 0.997246 - 0.885207I$	$3.63174 + 5.85824I$	0
$u = 1.31771 - 0.52143I$ $a = 0.13723 - 1.49979I$ $b = 0.997246 + 0.885207I$	$3.63174 - 5.85824I$	0
$u = -1.37313 + 0.36438I$ $a = -0.04599 - 1.56888I$ $b = 0.604568 + 1.134910I$	$11.8635 - 8.8046I$	0
$u = -1.37313 - 0.36438I$ $a = -0.04599 + 1.56888I$ $b = 0.604568 - 1.134910I$	$11.8635 + 8.8046I$	0
$u = -0.153275 + 0.539163I$ $a = 0.183448 + 0.292807I$ $b = -0.815929 + 0.401366I$	$-1.39440 + 1.01413I$	$-2.43614 - 1.49783I$
$u = -0.153275 - 0.539163I$ $a = 0.183448 - 0.292807I$ $b = -0.815929 - 0.401366I$	$-1.39440 - 1.01413I$	$-2.43614 + 1.49783I$
$u = -1.38286 + 0.50685I$ $a = 0.07770 - 1.47027I$ $b = 1.01010 + 1.07254I$	$6.12470 - 9.94560I$	0
$u = -1.38286 - 0.50685I$ $a = 0.07770 + 1.47027I$ $b = 1.01010 - 1.07254I$	$6.12470 + 9.94560I$	0
$u = 1.40141 + 0.56071I$ $a = 0.09688 + 1.42482I$ $b = 1.17626 - 1.07775I$	$1.86199 + 12.59430I$	0
$u = 1.40141 - 0.56071I$ $a = 0.09688 - 1.42482I$ $b = 1.17626 + 1.07775I$	$1.86199 - 12.59430I$	0

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.45240 + 0.53962I$		
$a = 0.057156 - 1.409450I$	$8.6839 - 12.8336I$	0
$b = 1.16253 + 1.24292I$		
$u = -1.45240 - 0.53962I$		
$a = 0.057156 + 1.409450I$	$8.6839 + 12.8336I$	0
$b = 1.16253 - 1.24292I$		
$u = 1.45843 + 0.55635I$		
$a = 0.063082 + 1.397950I$	$7.5897 + 18.7123I$	0
$b = 1.21703 - 1.24520I$		
$u = 1.45843 - 0.55635I$		
$a = 0.063082 - 1.397950I$	$7.5897 - 18.7123I$	0
$b = 1.21703 + 1.24520I$		

$$\text{II. } I_2^u = \langle 8.00 \times 10^{275} u^{83} + 1.95 \times 10^{276} u^{82} + \dots + 8.94 \times 10^{276} b - 2.94 \times 10^{279}, -2.62 \times 10^{279} u^{83} - 6.35 \times 10^{279} u^{82} + \dots + 2.67 \times 10^{280} a + 7.68 \times 10^{282}, u^{84} + u^{83} + \dots + 1700u + 2983 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_4 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_8 &= \begin{pmatrix} 0.0981441u^{83} + 0.237998u^{82} + \dots - 461.448u - 287.922 \\ -0.0894214u^{83} - 0.217766u^{82} + \dots + 415.217u + 328.609 \end{pmatrix} \\ a_{12} &= \begin{pmatrix} 1 \\ -u^2 \end{pmatrix} \\ a_9 &= \begin{pmatrix} 0.0717702u^{83} + 0.154245u^{82} + \dots - 346.149u - 199.348 \\ -0.0466237u^{83} - 0.0835566u^{82} + \dots + 238.998u + 157.447 \end{pmatrix} \\ a_5 &= \begin{pmatrix} -0.180265u^{83} - 0.321728u^{82} + \dots + 766.751u + 328.107 \\ 0.174737u^{83} + 0.332085u^{82} + \dots - 717.974u - 456.666 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{10} &= \begin{pmatrix} -0.180348u^{83} - 0.497384u^{82} + \dots + 739.524u + 644.660 \\ 0.251112u^{83} + 0.641466u^{82} + \dots - 1096.60u - 894.041 \end{pmatrix} \\ a_1 &= \begin{pmatrix} 0.170906u^{83} + 0.314317u^{82} + \dots - 852.555u - 530.571 \\ -0.0636915u^{83} - 0.0558300u^{82} + \dots + 362.180u + 134.499 \end{pmatrix} \\ a_2 &= \begin{pmatrix} 0.0385080u^{83} - 0.00797016u^{82} + \dots - 275.571u - 79.3238 \\ 0.0687064u^{83} + 0.266457u^{82} + \dots - 214.804u - 316.748 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -0.0970944u^{83} - 0.280754u^{82} + \dots + 381.748u + 372.199 \\ 0.285872u^{83} + 0.718243u^{82} + \dots - 1158.87u - 926.093 \end{pmatrix} \\ a_6 &= \begin{pmatrix} 0.504901u^{83} + 0.999388u^{82} + \dots - 1864.77u - 1209.57 \\ -0.399278u^{83} - 0.751070u^{82} + \dots + 1389.21u + 833.181 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = -1

(iii) Cusp Shapes = $-0.529975u^{83} - 1.07671u^{82} + \dots + 1915.72u + 1175.59$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$(u^{21} + 7u^{20} + \dots + 3u - 1)^4$
c_2, c_6	$(u^{21} + u^{20} + \dots + u + 1)^4$
c_3, c_4, c_9 c_{11}	$u^{84} + u^{83} + \dots + 1700u + 2983$
c_7	$(u^{21} - 5u^{20} + \dots - 11u + 3)^4$
c_8	$(u^2 - u + 1)^{42}$
c_{10}, c_{12}	$u^{84} - 23u^{83} + \dots - 646u + 37$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$(y^{21} + 15y^{20} + \dots + 27y - 1)^4$
c_2, c_6	$(y^{21} + 7y^{20} + \dots + 3y - 1)^4$
c_3, c_4, c_9 c_{11}	$y^{84} - 69y^{83} + \dots - 605825892y + 8898289$
c_7	$(y^{21} + 3y^{20} + \dots - 41y - 9)^4$
c_8	$(y^2 + y + 1)^{42}$
c_{10}, c_{12}	$y^{84} + 19y^{83} + \dots + 39856y + 1369$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.601980 + 0.847982I$ $a = -0.395112 + 0.064605I$ $b = 0.425024 - 0.439597I$	$6.30468 + 4.71576I$	0
$u = 0.601980 - 0.847982I$ $a = -0.395112 - 0.064605I$ $b = 0.425024 + 0.439597I$	$6.30468 - 4.71576I$	0
$u = -0.768780 + 0.567617I$ $a = 0.943793 - 0.486452I$ $b = 0.670826 + 0.088440I$	$-2.65275 - 2.26732I$	0
$u = -0.768780 - 0.567617I$ $a = 0.943793 + 0.486452I$ $b = 0.670826 - 0.088440I$	$-2.65275 + 2.26732I$	0
$u = 1.049670 + 0.081978I$ $a = -1.04625 - 1.09035I$ $b = 1.45807 + 0.50805I$	$2.91326 + 0.43299I$	0
$u = 1.049670 - 0.081978I$ $a = -1.04625 + 1.09035I$ $b = 1.45807 - 0.50805I$	$2.91326 - 0.43299I$	0
$u = 0.939509 + 0.083935I$ $a = 0.84854 + 1.30340I$ $b = -0.037440 - 0.409098I$	$1.53708 + 0.23287I$	0
$u = 0.939509 - 0.083935I$ $a = 0.84854 - 1.30340I$ $b = -0.037440 + 0.409098I$	$1.53708 - 0.23287I$	0
$u = 0.120597 + 1.085890I$ $a = 0.324279 - 0.122790I$ $b = 0.845498 + 0.638091I$	$-0.209312 - 0.222255I$	0
$u = 0.120597 - 1.085890I$ $a = 0.324279 + 0.122790I$ $b = 0.845498 - 0.638091I$	$-0.209312 + 0.222255I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.052550 + 0.310061I$ $a = 0.32578 - 1.84638I$ $b = -1.034750 + 0.789358I$	$-0.209312 + 0.222255I$	0
$u = 1.052550 - 0.310061I$ $a = 0.32578 + 1.84638I$ $b = -1.034750 - 0.789358I$	$-0.209312 - 0.222255I$	0
$u = 0.081948 + 1.103030I$ $a = 0.152729 + 0.151629I$ $b = 0.712209 - 0.710171I$	$1.53708 + 4.29264I$	0
$u = 0.081948 - 1.103030I$ $a = 0.152729 - 0.151629I$ $b = 0.712209 + 0.710171I$	$1.53708 - 4.29264I$	0
$u = -0.872714 + 0.160939I$ $a = 0.76623 + 1.81920I$ $b = -0.574764 - 0.257172I$	$-0.20931 - 3.83751I$	0
$u = -0.872714 - 0.160939I$ $a = 0.76623 - 1.81920I$ $b = -0.574764 + 0.257172I$	$-0.20931 + 3.83751I$	0
$u = -0.385745 + 0.789003I$ $a = 0.771823 + 0.107178I$ $b = 0.800393 - 0.345438I$	$-0.20931 + 3.83751I$	0
$u = -0.385745 - 0.789003I$ $a = 0.771823 - 0.107178I$ $b = 0.800393 + 0.345438I$	$-0.20931 - 3.83751I$	0
$u = 1.134620 + 0.022935I$ $a = -1.00246 + 1.31545I$ $b = 1.85846 - 0.77456I$	$7.83914 + 4.48847I$	0
$u = 1.134620 - 0.022935I$ $a = -1.00246 - 1.31545I$ $b = 1.85846 + 0.77456I$	$7.83914 - 4.48847I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.052490 + 0.480961I$ $a = 0.705316 + 0.737358I$ $b = 0.628364 - 0.494270I$	$3.61388 + 2.45396I$	0
$u = 1.052490 - 0.480961I$ $a = 0.705316 - 0.737358I$ $b = 0.628364 + 0.494270I$	$3.61388 - 2.45396I$	0
$u = -1.162680 + 0.004240I$ $a = -0.94957 - 1.31119I$ $b = 1.79655 + 0.89708I$	$8.59448 + 1.12879I$	0
$u = -1.162680 - 0.004240I$ $a = -0.94957 + 1.31119I$ $b = 1.79655 - 0.89708I$	$8.59448 - 1.12879I$	0
$u = -0.863159 + 0.799142I$ $a = -0.467671 + 0.197656I$ $b = 0.277087 + 0.199805I$	$6.09470 + 0.70163I$	0
$u = -0.863159 - 0.799142I$ $a = -0.467671 - 0.197656I$ $b = 0.277087 - 0.199805I$	$6.09470 - 0.70163I$	0
$u = -1.048850 + 0.560595I$ $a = 0.686771 - 0.663283I$ $b = 0.740316 + 0.462808I$	$2.56394 - 8.15338I$	0
$u = -1.048850 - 0.560595I$ $a = 0.686771 + 0.663283I$ $b = 0.740316 - 0.462808I$	$2.56394 + 8.15338I$	0
$u = -1.150960 + 0.299655I$ $a = 0.19965 + 1.74618I$ $b = -0.95104 - 1.15266I$	$1.53708 - 4.29264I$	0
$u = -1.150960 - 0.299655I$ $a = 0.19965 - 1.74618I$ $b = -0.95104 + 1.15266I$	$1.53708 + 4.29264I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.141140 + 0.376776I$ $a = 0.15415 - 1.85666I$ $b = -1.27540 + 1.15560I$	$-2.65275 + 6.32709I$	0
$u = 1.141140 - 0.376776I$ $a = 0.15415 + 1.85666I$ $b = -1.27540 - 1.15560I$	$-2.65275 - 6.32709I$	0
$u = -1.227890 + 0.132471I$ $a = -0.728674 + 1.178950I$ $b = 1.20230 - 1.12786I$	$5.75861 - 2.02988I$	0
$u = -1.227890 - 0.132471I$ $a = -0.728674 - 1.178950I$ $b = 1.20230 + 1.12786I$	$5.75861 + 2.02988I$	0
$u = 0.710745 + 0.257486I$ $a = -1.40228 - 0.34636I$ $b = 0.988633 - 0.200767I$	$6.09470 + 4.76140I$	$6.80842 - 5.46594I$
$u = 0.710745 - 0.257486I$ $a = -1.40228 + 0.34636I$ $b = 0.988633 + 0.200767I$	$6.09470 - 4.76140I$	$6.80842 + 5.46594I$
$u = -0.021423 + 1.260760I$ $a = 0.185863 - 0.033760I$ $b = 0.797169 + 0.822419I$	$-2.65275 - 6.32709I$	0
$u = -0.021423 - 1.260760I$ $a = 0.185863 + 0.033760I$ $b = 0.797169 - 0.822419I$	$-2.65275 + 6.32709I$	0
$u = -1.205030 + 0.379527I$ $a = 0.07156 + 1.81786I$ $b = -1.25638 - 1.44640I$	$3.61388 - 6.51373I$	0
$u = -1.205030 - 0.379527I$ $a = 0.07156 - 1.81786I$ $b = -1.25638 + 1.44640I$	$3.61388 + 6.51373I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.200130 + 0.399924I$ $a = 0.06593 - 1.84627I$ $b = -1.35668 + 1.43457I$	$2.56394 + 12.21310I$	0
$u = 1.200130 - 0.399924I$ $a = 0.06593 + 1.84627I$ $b = -1.35668 - 1.43457I$	$2.56394 - 12.21310I$	0
$u = 0.155036 + 1.309600I$ $a = 0.1067750 + 0.0075772I$ $b = 0.683635 - 0.896570I$	$3.61388 + 6.51373I$	0
$u = 0.155036 - 1.309600I$ $a = 0.1067750 - 0.0075772I$ $b = 0.683635 + 0.896570I$	$3.61388 - 6.51373I$	0
$u = -1.331340 + 0.069009I$ $a = -0.66571 + 1.39234I$ $b = 1.42093 - 1.71754I$	$8.59448 - 2.93098I$	0
$u = -1.331340 - 0.069009I$ $a = -0.66571 - 1.39234I$ $b = 1.42093 + 1.71754I$	$8.59448 + 2.93098I$	0
$u = -1.328000 + 0.198818I$ $a = -0.03686 + 1.42419I$ $b = -0.18850 - 1.60882I$	$6.30468 - 4.71576I$	0
$u = -1.328000 - 0.198818I$ $a = -0.03686 - 1.42419I$ $b = -0.18850 + 1.60882I$	$6.30468 + 4.71576I$	0
$u = 1.346210 + 0.144723I$ $a = -0.52346 - 1.32462I$ $b = 0.92154 + 1.71078I$	$2.91326 + 3.62678I$	0
$u = 1.346210 - 0.144723I$ $a = -0.52346 + 1.32462I$ $b = 0.92154 - 1.71078I$	$2.91326 - 3.62678I$	0

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.352110 + 0.075673I$ $a = -0.63529 - 1.41451I$ $b = 1.36834 + 1.84188I$	$7.83914 + 8.54824I$	0
$u = 1.352110 - 0.075673I$ $a = -0.63529 + 1.41451I$ $b = 1.36834 - 1.84188I$	$7.83914 - 8.54824I$	0
$u = -0.128917 + 1.350010I$ $a = 0.1223140 + 0.0131157I$ $b = 0.716321 + 0.932286I$	$2.56394 - 12.21310I$	0
$u = -0.128917 - 1.350010I$ $a = 0.1223140 - 0.0131157I$ $b = 0.716321 - 0.932286I$	$2.56394 + 12.21310I$	0
$u = 1.369380 + 0.196398I$ $a = -0.199637 - 1.349260I$ $b = 0.14091 + 1.71944I$	$6.09470 - 0.70163I$	0
$u = 1.369380 - 0.196398I$ $a = -0.199637 + 1.349260I$ $b = 0.14091 - 1.71944I$	$6.09470 + 0.70163I$	0
$u = 1.388100 + 0.034594I$ $a = 0.160651 - 1.101620I$ $b = 0.084846 + 1.239850I$	$6.30468 - 0.65599I$	0
$u = 1.388100 - 0.034594I$ $a = 0.160651 + 1.101620I$ $b = 0.084846 - 1.239850I$	$6.30468 + 0.65599I$	0
$u = -0.462900 + 0.338762I$ $a = -1.48845 - 0.51444I$ $b = 0.809467 + 0.450405I$	$6.30468 + 0.65599I$	$7.85070 - 0.21108I$
$u = -0.462900 - 0.338762I$ $a = -1.48845 + 0.51444I$ $b = 0.809467 - 0.450405I$	$6.30468 - 0.65599I$	$7.85070 + 0.21108I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.556631 + 0.039904I$		
$a = 1.80134 + 1.97905I$	$-2.65275 + 2.26732I$	$-0.751433 - 0.468938I$
$b = -0.143171 + 0.336012I$		
$u = -0.556631 - 0.039904I$		
$a = 1.80134 - 1.97905I$	$-2.65275 - 2.26732I$	$-0.751433 + 0.468938I$
$b = -0.143171 - 0.336012I$		
$u = 0.290742 + 0.440170I$		
$a = 1.61434 - 0.53235I$	$1.53708 + 0.23287I$	$6.12423 + 0.35001I$
$b = 0.540061 + 0.394688I$		
$u = 0.290742 - 0.440170I$		
$a = 1.61434 + 0.53235I$	$1.53708 - 0.23287I$	$6.12423 - 0.35001I$
$b = 0.540061 - 0.394688I$		
$u = -1.48585 + 0.12046I$		
$a = 0.010822 + 0.999659I$	$6.09470 - 4.76140I$	0
$b = 0.118412 - 1.322580I$		
$u = -1.48585 - 0.12046I$		
$a = 0.010822 - 0.999659I$	$6.09470 + 4.76140I$	0
$b = 0.118412 + 1.322580I$		
$u = -1.31142 + 0.76548I$		
$a = -0.313707 + 0.501417I$	$2.91326 - 3.62678I$	0
$b = -0.151011 - 0.332343I$		
$u = -1.31142 - 0.76548I$		
$a = -0.313707 - 0.501417I$	$2.91326 + 3.62678I$	0
$b = -0.151011 + 0.332343I$		
$u = 1.46722 + 0.54701I$		
$a = -0.264308 - 0.671365I$	$5.75861 + 2.02988I$	0
$b = -0.087745 + 0.802616I$		
$u = 1.46722 - 0.54701I$		
$a = -0.264308 + 0.671365I$	$5.75861 - 2.02988I$	0
$b = -0.087745 - 0.802616I$		

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.60465 + 0.36222I$ $a = -0.133395 + 0.774134I$ $b = -0.073945 - 1.180800I$	$2.91326 - 0.43299I$	0
$u = -1.60465 - 0.36222I$ $a = -0.133395 - 0.774134I$ $b = -0.073945 + 1.180800I$	$2.91326 + 0.43299I$	0
$u = -0.309551 + 0.107943I$ $a = 2.95791 + 3.53411I$ $b = 0.014856 + 0.766229I$	$2.56394 + 8.15338I$	$4.74618 - 3.74885I$
$u = -0.309551 - 0.107943I$ $a = 2.95791 - 3.53411I$ $b = 0.014856 - 0.766229I$	$2.56394 - 8.15338I$	$4.74618 + 3.74885I$
$u = 1.51563 + 0.78115I$ $a = -0.212584 - 0.544293I$ $b = -0.430203 + 0.555541I$	$8.59448 + 2.93098I$	0
$u = 1.51563 - 0.78115I$ $a = -0.212584 + 0.544293I$ $b = -0.430203 - 0.555541I$	$8.59448 - 2.93098I$	0
$u = -1.49353 + 0.82752I$ $a = -0.214147 + 0.521007I$ $b = -0.456812 - 0.468715I$	$7.83914 - 8.54824I$	0
$u = -1.49353 - 0.82752I$ $a = -0.214147 - 0.521007I$ $b = -0.456812 + 0.468715I$	$7.83914 + 8.54824I$	0
$u = 0.277977 + 0.036672I$ $a = 3.99712 - 3.05760I$ $b = 0.134175 - 0.715367I$	$3.61388 - 2.45396I$	$6.56586 - 0.99058I$
$u = 0.277977 - 0.036672I$ $a = 3.99712 + 3.05760I$ $b = 0.134175 + 0.715367I$	$3.61388 + 2.45396I$	$6.56586 + 0.99058I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 1.68726 + 0.51144I$ $a = -0.130407 - 0.672426I$ $b = -0.323367 + 1.097460I$	$8.59448 + 1.12879I$	0
$u = 1.68726 - 0.51144I$ $a = -0.130407 + 0.672426I$ $b = -0.323367 - 1.097460I$	$8.59448 - 1.12879I$	0
$u = -1.71502 + 0.47546I$ $a = -0.110914 + 0.683286I$ $b = -0.313187 - 1.170150I$	$7.83914 + 4.48847I$	0
$u = -1.71502 - 0.47546I$ $a = -0.110914 - 0.683286I$ $b = -0.313187 + 1.170150I$	$7.83914 - 4.48847I$	0

$$\text{III. } I_3^u = \langle -u^2 + b + 1, u^{20} - u^{19} + \dots + a + 2, u^{21} - u^{20} + \dots - 3u + 1 \rangle$$

(i) Arc colorings

$$\begin{aligned} a_4 &= \begin{pmatrix} 0 \\ u \end{pmatrix} \\ a_{11} &= \begin{pmatrix} 1 \\ 0 \end{pmatrix} \\ a_8 &= \begin{pmatrix} -u^{20} + u^{19} + \dots + u - 2 \\ u^2 - 1 \end{pmatrix} \\ a_{12} &= \begin{pmatrix} 1 \\ -u^2 \end{pmatrix} \\ a_9 &= \begin{pmatrix} -1 \\ -u^{20} + u^{19} + \dots + u - 1 \end{pmatrix} \\ a_5 &= \begin{pmatrix} u \\ u^{19} - u^{18} + \dots + 5u - 1 \end{pmatrix} \\ a_3 &= \begin{pmatrix} -u \\ u \end{pmatrix} \\ a_{10} &= \begin{pmatrix} u^2 - 1 \\ -u^4 + 2u^2 - 1 \end{pmatrix} \\ a_1 &= \begin{pmatrix} u^4 - 2u^2 + 2 \\ -u^6 + 3u^4 - 4u^2 + 1 \end{pmatrix} \\ a_2 &= \begin{pmatrix} u^8 - 4u^6 + 7u^4 - 5u^2 + 2 \\ -u^8 + 3u^6 - 3u^4 - u^2 + 1 \end{pmatrix} \\ a_7 &= \begin{pmatrix} -u^8 + 4u^6 - 7u^4 + 5u^2 - 2 \\ -u^{20} + u^{19} + \dots + u - 1 \end{pmatrix} \\ a_6 &= \begin{pmatrix} u^{15} - 8u^{13} + 29u^{11} - 60u^9 + 76u^7 - 59u^5 + 27u^3 - 5u \\ u^{19} - u^{18} + \dots + 2u - 1 \end{pmatrix} \end{aligned}$$

(ii) Obstruction class = 1

(iii) Cusp Shapes

$$\begin{aligned} &= -9u^{20} + 8u^{19} + 94u^{18} - 82u^{17} - 443u^{16} + 377u^{15} + 1211u^{14} - 1007u^{13} - 2067u^{12} + \\ &1696u^{11} + 2199u^{10} - 1826u^9 - 1352u^8 + 1202u^7 + 358u^6 - 403u^5 + 43u^4 + 7u^3 - 46u^2 + 24u - 3 \end{aligned}$$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_5	$u^{21} - 7u^{20} + \dots - 11u + 1$
c_2	$u^{21} - u^{20} + \dots - u + 1$
c_3, c_9	$u^{21} + u^{20} + \dots - 3u - 1$
c_4, c_{11}	$u^{21} - u^{20} + \dots - 3u + 1$
c_6	$u^{21} + u^{20} + \dots - u - 1$
c_7	$u^{21} - 5u^{20} + \dots - 3u - 1$
c_8	$u^{21} - 3u^{20} + \dots - 2u - 1$
c_{10}, c_{12}	$u^{21} - 2u^{20} + \dots + 3u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_5	$y^{21} + 15y^{20} + \dots + 13y - 1$
c_2, c_6	$y^{21} + 7y^{20} + \dots - 11y - 1$
c_3, c_4, c_9 c_{11}	$y^{21} - 23y^{20} + \dots - 3y - 1$
c_7	$y^{21} + 3y^{20} + \dots - 5y - 1$
c_8	$y^{21} - 3y^{20} + \dots - 2y - 1$
c_{10}, c_{12}	$y^{21} + 2y^{20} + \dots + 3y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.841520 + 0.362436I$ $a = -1.76779 + 1.10668I$ $b = -0.423205 - 0.609994I$	$3.95731 - 3.50651I$	$8.68550 + 7.78549I$
$u = -0.841520 - 0.362436I$ $a = -1.76779 - 1.10668I$ $b = -0.423205 + 0.609994I$	$3.95731 + 3.50651I$	$8.68550 - 7.78549I$
$u = 0.798631 + 0.431022I$ $a = -1.70775 - 0.88920I$ $b = -0.547968 + 0.688455I$	$2.76934 + 9.34002I$	$5.48241 - 11.01139I$
$u = 0.798631 - 0.431022I$ $a = -1.70775 + 0.88920I$ $b = -0.547968 - 0.688455I$	$2.76934 - 9.34002I$	$5.48241 + 11.01139I$
$u = -1.224270 + 0.317561I$ $a = -0.478386 + 1.019090I$ $b = 0.397989 - 0.777561I$	$4.61385 - 1.80955I$	$5.20830 + 1.73152I$
$u = -1.224270 - 0.317561I$ $a = -0.478386 - 1.019090I$ $b = 0.397989 + 0.777561I$	$4.61385 + 1.80955I$	$5.20830 - 1.73152I$
$u = -0.693036$ $a = -2.92418$ $b = -0.519701$	0.895273	-12.9680
$u = 0.587768 + 0.276453I$ $a = -2.14228 - 0.50785I$ $b = -0.730955 + 0.324980I$	$-2.96854 + 3.18391I$	$-4.89145 - 8.07576I$
$u = 0.587768 - 0.276453I$ $a = -2.14228 + 0.50785I$ $b = -0.730955 - 0.324980I$	$-2.96854 - 3.18391I$	$-4.89145 + 8.07576I$
$u = -1.292040 + 0.455283I$ $a = -0.710775 + 0.736396I$ $b = 0.462072 - 1.176480I$	$7.08730 - 3.28052I$	$10.50843 + 2.68857I$

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -1.292040 - 0.455283I$ $a = -0.710775 - 0.736396I$ $b = 0.462072 + 1.176480I$	$7.08730 + 3.28052I$	$10.50843 - 2.68857I$
$u = 1.329150 + 0.454382I$ $a = -0.684013 - 0.681349I$ $b = 0.560176 + 1.207890I$	$6.60607 - 2.06273I$	$8.81350 + 3.56262I$
$u = 1.329150 - 0.454382I$ $a = -0.684013 + 0.681349I$ $b = 0.560176 - 1.207890I$	$6.60607 + 2.06273I$	$8.81350 - 3.56262I$
$u = 1.366990 + 0.357344I$ $a = -0.507173 - 0.649796I$ $b = 0.740967 + 0.976970I$	$2.81576 + 2.43488I$	$1.83704 - 1.00056I$
$u = 1.366990 - 0.357344I$ $a = -0.507173 + 0.649796I$ $b = 0.740967 - 0.976970I$	$2.81576 - 2.43488I$	$1.83704 + 1.00056I$
$u = -1.40141 + 0.22889I$ $a = -0.266356 + 0.516321I$ $b = 0.911562 - 0.641535I$	$8.10450 - 1.41862I$	$9.55417 - 0.16796I$
$u = -1.40141 - 0.22889I$ $a = -0.266356 - 0.516321I$ $b = 0.911562 + 0.641535I$	$8.10450 + 1.41862I$	$9.55417 + 0.16796I$
$u = 1.42728 + 0.26030I$ $a = -0.350186 - 0.498089I$ $b = 0.969365 + 0.743027I$	$7.46906 + 7.03476I$	$8.15699 - 5.23270I$
$u = 1.42728 - 0.26030I$ $a = -0.350186 + 0.498089I$ $b = 0.969365 - 0.743027I$	$7.46906 - 7.03476I$	$8.15699 + 5.23270I$
$u = 0.095937 + 0.298927I$ $a = -1.92319 - 0.04902I$ $b = -1.080150 + 0.057356I$	$-1.42388 - 2.26286I$	$1.62919 + 4.65561I$

Solutions to I_3^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.095937 - 0.298927I$		
$a = -1.92319 + 0.04902I$	$-1.42388 + 2.26286I$	$1.62919 - 4.65561I$
$b = -1.080150 - 0.057356I$		

IV. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_5	$(u^{21} - 7u^{20} + \dots - 11u + 1)(u^{21} + 7u^{20} + \dots + 3u - 1)^4$ $\cdot (u^{44} + 14u^{43} + \dots + 4u + 16)$
c_2	$(u^{21} - u^{20} + \dots - u + 1)(u^{21} + u^{20} + \dots + u + 1)^4$ $\cdot (u^{44} - 6u^{43} + \dots - 2u - 4)$
c_3, c_9	$(u^{21} + u^{20} + \dots - 3u - 1)(u^{44} - u^{43} + \dots + u + 1)$ $\cdot (u^{84} + u^{83} + \dots + 1700u + 2983)$
c_4, c_{11}	$(u^{21} - u^{20} + \dots - 3u + 1)(u^{44} - u^{43} + \dots + u + 1)$ $\cdot (u^{84} + u^{83} + \dots + 1700u + 2983)$
c_6	$(u^{21} + u^{20} + \dots - u - 1)(u^{21} + u^{20} + \dots + u + 1)^4$ $\cdot (u^{44} - 6u^{43} + \dots - 2u - 4)$
c_7	$((u^{21} - 5u^{20} + \dots - 11u + 3)^4)(u^{21} - 5u^{20} + \dots - 3u - 1)$ $\cdot (u^{44} + 30u^{43} + \dots - 88022u - 6988)$
c_8	$((u^2 - u + 1)^{42})(u^{21} - 3u^{20} + \dots - 2u - 1)$ $\cdot (u^{44} + 40u^{43} + \dots - 42991616u - 2097152)$
c_{10}, c_{12}	$(u^{21} - 2u^{20} + \dots + 3u + 1)(u^{44} + 2u^{43} + \dots + 7u - 1)$ $\cdot (u^{84} - 23u^{83} + \dots - 646u + 37)$

V. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_5	$((y^{21} + 15y^{20} + \dots + 27y - 1)^4)(y^{21} + 15y^{20} + \dots + 13y - 1)$ $\cdot (y^{44} + 30y^{43} + \dots + 9744y + 256)$
c_2, c_6	$(y^{21} + 7y^{20} + \dots - 11y - 1)(y^{21} + 7y^{20} + \dots + 3y - 1)^4$ $\cdot (y^{44} + 14y^{43} + \dots + 4y + 16)$
c_3, c_4, c_9 c_{11}	$(y^{21} - 23y^{20} + \dots - 3y - 1)(y^{44} - 31y^{43} + \dots + y + 1)$ $\cdot (y^{84} - 69y^{83} + \dots - 605825892y + 8898289)$
c_7	$(y^{21} + 3y^{20} + \dots - 5y - 1)(y^{21} + 3y^{20} + \dots - 41y - 9)^4$ $\cdot (y^{44} + 6y^{43} + \dots + 106960964y + 48832144)$
c_8	$((y^2 + y + 1)^{42})(y^{21} - 3y^{20} + \dots - 2y - 1)$ $\cdot (y^{44} - 2y^{43} + \dots - 7696581394432y + 4398046511104)$
c_{10}, c_{12}	$(y^{21} + 2y^{20} + \dots + 3y - 1)(y^{44} - 10y^{43} + \dots - 37y + 1)$ $\cdot (y^{84} + 19y^{83} + \dots + 39856y + 1369)$