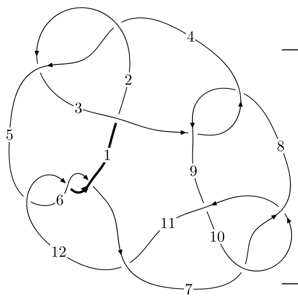
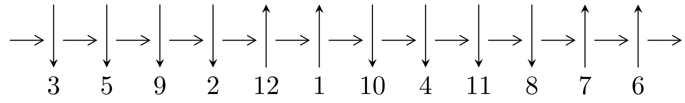
$12a_{0166}$ ($K12a_{0166}$)



A knot diagram[1]

Linearized knot diagam



Solving Sequence

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

Ideals for irreducible components[2] of $X_{\mathbf{par}}$

[1] 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`).

$$\begin{aligned}
I^u_1 = \langle &458802669672u^{24} + 367351897733u^{23} + \cdots + 7058049605558d - 1244576019090,\\
&147880761515u^{24} - 335144114156u^{23} + \cdots + 28232198422232c - 35621876846456,\\
&1278289196883u^{24} + 1997820239306u^{23} + \cdots + 141160992111116b - 10424467040404,\\
&377943683179u^{24} + 896277965838u^{23} + \cdots + 28232198422232a - 14859817453240,\\
&u^{25} + 2u^{24} + \cdots - 16u - 8\rangle\\
I^u_2 = \langle &2u^{10}a - u^{10} + \cdots - 6a - 7,\ 10u^{10}a + 5u^{10} + \cdots - 18a - 34,\ 2u^9a + 3u^{10} + \cdots + b + 2a,\\
&3u^{10}a + 8u^{10} + \cdots + 2a^2 - 6,\ u^{11} - 3u^{10} + 6u^9 - 7u^8 + 7u^7 - 3u^6 - 2u^5 + 8u^4 - 7u^3 + 5u^2 - 2u + 2\rangle\\
I^u_3 = \langle &-u^7 - u^5 - 2u^3 + d - u,\ -u^7 - 2u^5 - 2u^3 + c - 2u,\ u^8a + 25u^8 + \cdots - 28a + 13,\\
&-u^8 - 2u^7 - 3u^6 - 3u^5 - 3u^4 + u^2a - 2u^3 + a^2 + 2au - 3u^2 + a,\\
&u^9 + u^8 + 2u^7 + u^6 + 3u^5 + u^4 + 2u^3 + u - 1\rangle\\
I^u_4 = \langle &u^8c + 5u^8 + \cdots - 27c + 10,\ 2u^8c - 2u^8 + \cdots + 2c - 4,\ -u^2 + b,\ -u^2 + a - 1,\\
&u^9 + u^8 + 2u^7 + u^6 + 3u^5 + u^4 + 2u^3 + u - 1\rangle\\
I^u_5 = \langle &-u^7 - u^5 - 2u^3 + d - u,\ -u^7 - 2u^5 - 2u^3 + c - 2u,\ -u^2 + b,\ -u^2 + a - 1,\\
&u^9 + u^8 + 2u^7 + u^6 + 3u^5 + u^4 + 2u^3 + u - 1\rangle
\end{aligned}$$

$$\begin{aligned}
I^v_1 &= \langle a,\ d - 1,\ c - a - 1,\ b - 1,\ v + 1\rangle\\
I^v_2 &= \langle a,\ d,\ c - 1,\ b + 1,\ v - 1\rangle\\
I^v_3 &= \langle c,\ d - 1,\ b,\ a - 1,\ v - 1\rangle\\
I^v_4 &= \langle c,\ d - 1,\ av + c - v - 1,\ bv + 1\rangle
\end{aligned}$$

* 8 irreducible components of $\dim_{\mathbb{C}} = 0$, with total 95 representations.
* 1 irreducible components of $\dim_{\mathbb{C}} = 1$

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

I. $\boldsymbol{I^u_1 = \langle 4.59\times10^{11}u^{24} + 3.67\times10^{11}u^{23} + \cdots + 7.06\times10^{12}d - 1.24\times10^{12},\ 1.48\times10^{11}u^{24} - 3.35\times10^{11}u^{23} + \cdots + 2.82\times10^{13}c - 3.56\times10^{13},\ 1.28\times10^{12}u^{24} + 2.00\times10^{12}u^{23} + \cdots + 1.41\times10^{13}b - 1.04\times10^{13},\ 3.78\times10^{11}u^{24} + 8.96\times10^{11}u^{23} + \cdots + 2.82\times10^{13}a - 1.49\times10^{13},\ u^{25} + 2u^{24} + \cdots - 16u - 8\rangle}$

(i) Arc colorings

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

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -0.00523802u^{24} + 0.0118710u^{23} + \cdots + 0.471795u + 1.26175 \\ -0.0650042u^{24} - 0.0520472u^{23} + \cdots + 0.578878u + 0.176334 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} 0.0597662u^{24} + 0.0639182u^{23} + \cdots - 0.107083u + 1.08541 \\ -0.0650042u^{24} - 0.0520472u^{23} + \cdots + 0.578878u + 0.176334 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} -0.0133870u^{24} - 0.0317467u^{23} + \cdots + 1.11820u + 0.526343 \\ -0.0905554u^{24} - 0.141528u^{23} + \cdots + 1.83403u + 0.738481 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.0220418u^{24} - 0.0209206u^{23} + \cdots + 1.13918u + 0.226210 \\ 0.0223470u^{24} - 0.0180859u^{23} + \cdots + 1.17794u - 0.0419041 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.0776559u^{24} - 0.117795u^{23} + \cdots + 0.902489u + 0.251920 \\ -0.0910429u^{24} - 0.149542u^{23} + \cdots + 2.02069u + 0.778262 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 0.0972828u^{24} + 0.103523u^{23} + \cdots - 1.09766u + 0.464165 \\ 0.0375166u^{24} + 0.0396045u^{23} + \cdots - 0.990575u - 0.621247 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 0.151545u^{24} + 0.183512u^{23} + \cdots - 2.01089u - 0.346355 \\ 0.119577u^{24} + 0.131747u^{23} + \cdots - 2.07836u - 1.21236 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} 0.0923101u^{24} + 0.0940648u^{23} + \cdots - 0.785506u + 0.357069 \\ -0.00497271u^{24} - 0.00945799u^{23} + \cdots + 0.312151u - 0.107096 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= \frac{8058725701665}{7058049605558}u^{24} + \frac{10736954342885}{7058049605558}u^{23} + \cdots - \frac{38478403451674}{3529024802779}u - \frac{29622418287164}{3529024802779}$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^{25}+12u^{24}+\cdots+3u+1$
c_2, c_4, c_7 c_{10}	$u^{25}-2u^{24}+\cdots-u+1$
c_3, c_8	$u^{25}-2u^{24}+\cdots-16u+8$
c_5, c_6, c_{12}	$u^{25}+2u^{24}+\cdots+8u+4$
c_{11}	$u^{25}-6u^{24}+\cdots+64u+64$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y^{25} + 8y^{24} + \cdots - 13y - 1$
c_2, c_4, c_7 c_{10}	$y^{25} - 12y^{24} + \cdots + 3y - 1$
c_3, c_8	$y^{25} + 6y^{24} + \cdots + 64y - 64$
c_5, c_6, c_{12}	$y^{25} - 22y^{24} + \cdots + 88y - 16$
c_{11}	$y^{25} + 14y^{24} + \cdots + 43008y - 4096$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 1.041130 + 0.234144I$ $a = 0.008394 + 0.208390I$ $b = -0.269928 + 1.383510I$ $c = 1.348140 - 0.409095I$ $d = 0.853442 - 0.558038I$	$3.14377 + 4.46824I$	$-1.00511 - 6.27335I$
$u = 1.041130 - 0.234144I$ $a = 0.008394 - 0.208390I$ $b = -0.269928 - 1.383510I$ $c = 1.348140 + 0.409095I$ $d = 0.853442 + 0.558038I$	$3.14377 - 4.46824I$	$-1.00511 + 6.27335I$
$u = -0.804646 + 0.457350I$ $a = -0.895367 + 0.386742I$ $b = -1.161700 + 0.803797I$ $c = 0.875912 - 0.274270I$ $d = 0.214886 - 0.601608I$	$2.41327 - 0.90505I$	$1.24488 - 0.76686I$
$u = -0.804646 - 0.457350I$ $a = -0.895367 - 0.386742I$ $b = -1.161700 - 0.803797I$ $c = 0.875912 + 0.274270I$ $d = 0.214886 + 0.601608I$	$2.41327 + 0.90505I$	$1.24488 + 0.76686I$
$u = -0.336133 + 1.048560I$ $a = -0.156441 - 0.276251I$ $b = 0.845749 + 0.298371I$ $c = -0.694150 - 1.216860I$ $d = -0.927060 + 0.554841I$	$0.70247 + 6.59785I$	$-2.96140 - 9.56947I$
$u = -0.336133 - 1.048560I$ $a = -0.156441 + 0.276251I$ $b = 0.845749 - 0.298371I$ $c = -0.694150 + 1.216860I$ $d = -0.927060 - 0.554841I$	$0.70247 - 6.59785I$	$-2.96140 + 9.56947I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.926049 + 0.758012I$ $a = -1.42251 - 0.81155I$ $b = -0.87316 - 1.69108I$ $c = 1.62524 - 0.37230I$ $d = 1.187970 - 0.465287I$	$-7.68831 + 5.75962I$	$-10.13195 - 4.49272I$
$u = 0.926049 - 0.758012I$ $a = -1.42251 + 0.81155I$ $b = -0.87316 + 1.69108I$ $c = 1.62524 + 0.37230I$ $d = 1.187970 + 0.465287I$	$-7.68831 - 5.75962I$	$-10.13195 + 4.49272I$
$u = -0.759240 + 0.251838I$ $a = -0.264762 - 0.457484I$ $b = -0.051945 + 0.352201I$ $c = 1.384510 + 0.243604I$ $d = 0.865432 + 0.337523I$	$-2.09943 - 2.64913I$	$-8.26724 + 7.08829I$
$u = -0.759240 - 0.251838I$ $a = -0.264762 + 0.457484I$ $b = -0.051945 - 0.352201I$ $c = 1.384510 - 0.243604I$ $d = 0.865432 - 0.337523I$	$-2.09943 + 2.64913I$	$-8.26724 - 7.08829I$
$u = -0.169266 + 0.764490I$ $a = -0.128013 + 0.686745I$ $b = -0.303623 + 0.446468I$ $c = 0.734127 + 0.404802I$ $d = -0.420684 - 0.407489I$	$1.62680 - 1.08260I$	$3.35440 + 3.89731I$
$u = -0.169266 - 0.764490I$ $a = -0.128013 - 0.686745I$ $b = -0.303623 - 0.446468I$ $c = 0.734127 - 0.404802I$ $d = -0.420684 + 0.407489I$	$1.62680 + 1.08260I$	$3.35440 - 3.89731I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.096683 + 1.217070I$ $a = -0.596071 + 0.850107I$ $b = 0.883990 - 0.599145I$ $c = -0.133481 - 0.336989I$ $d = -0.646064 + 0.751814I$	$8.85704 + 0.98974I$	$4.51267 - 2.53049I$
$u = 0.096683 - 1.217070I$ $a = -0.596071 - 0.850107I$ $b = 0.883990 + 0.599145I$ $c = -0.133481 + 0.336989I$ $d = -0.646064 - 0.751814I$	$8.85704 - 0.98974I$	$4.51267 + 2.53049I$
$u = -0.661369 + 1.057320I$ $a = -0.57589 + 1.50124I$ $b = 1.36579 + 0.96216I$ $c = 0.362414 - 0.234138I$ $d = -0.212320 - 0.866068I$	$4.06909 + 6.32284I$	$1.86961 - 4.09954I$
$u = -0.661369 - 1.057320I$ $a = -0.57589 - 1.50124I$ $b = 1.36579 - 0.96216I$ $c = 0.362414 + 0.234138I$ $d = -0.212320 + 0.866068I$	$4.06909 - 6.32284I$	$1.86961 + 4.09954I$
$u = -1.024310 + 0.754591I$ $a = 1.59421 - 0.47481I$ $b = 1.76886 - 1.85122I$ $c = 1.62073 + 0.41845I$ $d = 1.188320 + 0.521494I$	$-3.22783 - 10.10170I$	$-5.60475 + 6.88322I$
$u = -1.024310 - 0.754591I$ $a = 1.59421 + 0.47481I$ $b = 1.76886 + 1.85122I$ $c = 1.62073 - 0.41845I$ $d = 1.188320 - 0.521494I$	$-3.22783 + 10.10170I$	$-5.60475 - 6.88322I$

Solutions to I_1^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.425565 + 1.220260I$ $a = 0.635489 - 0.691012I$ $b = -0.588986 + 0.949659I$ $c = -1.004750 + 0.853367I$ $d = -1.001440 - 0.660540I$	$6.70868 - 9.75196I$	$0.64851 + 8.69449I$
$u = 0.425565 - 1.220260I$ $a = 0.635489 + 0.691012I$ $b = -0.588986 - 0.949659I$ $c = -1.004750 - 0.853367I$ $d = -1.001440 + 0.660540I$	$6.70868 + 9.75196I$	$0.64851 - 8.69449I$
$u = 0.797713 + 1.033120I$ $a = -0.52447 - 1.76199I$ $b = 1.27330 - 1.73823I$ $c = -1.87693 + 1.11019I$ $d = -1.213130 - 0.525024I$	$-6.80818 - 12.11480I$	$-8.50713 + 8.67244I$
$u = 0.797713 - 1.033120I$ $a = -0.52447 + 1.76199I$ $b = 1.27330 + 1.73823I$ $c = -1.87693 - 1.11019I$ $d = -1.213130 + 0.525024I$	$-6.80818 + 12.11480I$	$-8.50713 - 8.67244I$
$u = -0.832592 + 1.087810I$ $a = 0.39378 - 1.99462I$ $b = -2.07832 - 1.63190I$ $c = -1.88297 - 0.97500I$ $d = -1.234910 + 0.554337I$	$-2.1296 + 16.8657I$	$-4.74649 - 10.33694I$
$u = -0.832592 - 1.087810I$ $a = 0.39378 + 1.99462I$ $b = -2.07832 + 1.63190I$ $c = -1.88297 + 0.97500I$ $d = -1.234910 - 0.554337I$	$-2.1296 - 16.8657I$	$-4.74649 + 10.33694I$

Solutions to I_1^u		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u =$	0.600838		
$a =$	0.863277		
$b =$	0.379944	-1.26593	-6.81200
$c =$	1.28245		
$d =$	0.691126		

II. $\boldsymbol{I_2^u = \langle 2u^{10}a - u^{10} + \cdots - 6a - 7,\ 10u^{10}a + 5u^{10} + \cdots - 18a - 34,\ 2u^9a + 3u^{10} + \cdots + b + 2a,\ 3u^{10}a + 8u^{10} + \cdots + 2a^2 - 6,\ u^{11} - 3u^{10} + \cdots - 2u + 2\rangle}$

(i) Arc colorings

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

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} -5u^{10}a - \frac{5}{2}u^{10} + \cdots + 9a + 17 \\ -2u^{10}a + u^{10} + \cdots + 6a + 7 \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} -3u^{10}a - \frac{7}{2}u^{10} + \cdots + 3a + 10 \\ -2u^{10}a + u^{10} + \cdots + 6a + 7 \end{pmatrix}$$

$$a_1 = \begin{pmatrix} a \\ -2u^9a - 3u^{10} + \cdots - 2a - 3u \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 3u^{10}a + 3u^{10} + \cdots - 3a - 10 \\ 2u^{10}a - 7u^{10} + \cdots - 10a - 6 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -2u^9a - 3u^{10} + \cdots - 3a - 3u \\ -2u^9a - 3u^{10} + \cdots - 2a - 3u \end{pmatrix}$$

$$a_7 = \begin{pmatrix} -u^{10}a + \frac{3}{2}u^{10} + \cdots + 3a + 1 \\ 2u^{10}a + 5u^{10} + \cdots + 6u - 9 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} u^9a + \frac{3}{2}u^{10} + \cdots + 2a + 1 \\ u^{10}a + 3u^{10} + \cdots + 3u - 3 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} -u^{10}a - \frac{3}{2}u^{10} + \cdots + 3a + 4 \\ -3u^{10} + 6u^9 + \cdots - 3u + 3 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes
$= 2u^{10} - 8u^9 + 10u^8 - 10u^7 + 4u^6 - 4u^5 - 14u^4 + 12u^3 - 6u^2 - 8u - 12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^{22} + 11u^{21} + \cdots + 40u + 16$
c_2, c_4, c_7 c_{10}	$u^{22} - u^{21} + \cdots - 4u + 4$
c_3, c_8	$(u^{11} + 3u^{10} + 6u^9 + 7u^8 + 7u^7 + 3u^6 - 2u^5 - 8u^4 - 7u^3 - 5u^2 - 2u - 2)^2$
c_5, c_6, c_{12}	$(u^{11} + u^{10} - 5u^9 - 4u^8 + 9u^7 + 4u^6 - 5u^5 + 3u^4 - 3u^3 - 5u^2 + 3u - 1)^2$
c_{11}	$(u^{11} - 3u^{10} + \cdots - 16u + 4)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y^{22} - 3y^{21} + \cdots - 544y + 256$
c_2, c_4, c_7 c_{10}	$y^{22} - 11y^{21} + \cdots - 40y + 16$
c_3, c_8	$(y^{11} + 3y^{10} + \cdots - 16y - 4)^2$
c_5, c_6, c_{12}	$(y^{11} - 11y^{10} + \cdots - y - 1)^2$
c_{11}	$(y^{11} + 7y^{10} + \cdots + 24y - 16)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.992754$ $a = -0.539348 + 0.169351I$ $b = -0.94293 + 1.07661I$ $c = 1.202080 - 0.374899I$ $d = 0.660661 - 0.556253I$	3.69004	0.666830
$u = -0.992754$ $a = -0.539348 - 0.169351I$ $b = -0.94293 - 1.07661I$ $c = 1.202080 + 0.374899I$ $d = 0.660661 + 0.556253I$	3.69004	0.666830
$u = 0.762686 + 0.875309I$ $a = -0.98257 - 1.33960I$ $b = -0.38116 - 2.19608I$ $c = 1.68434 - 0.30273I$ $d = 1.252300 - 0.374583I$	$-7.89368 - 2.87937I$	$-10.41286 + 3.23335I$
$u = 0.762686 + 0.875309I$ $a = -1.44491 - 1.55956I$ $b = 0.70519 - 1.74288I$ $c = -2.02916 + 1.48909I$ $d = -1.190170 - 0.436468I$	$-7.89368 - 2.87937I$	$-10.41286 + 3.23335I$
$u = 0.762686 - 0.875309I$ $a = -0.98257 + 1.33960I$ $b = -0.38116 + 2.19608I$ $c = 1.68434 + 0.30273I$ $d = 1.252300 + 0.374583I$	$-7.89368 + 2.87937I$	$-10.41286 - 3.23335I$
$u = 0.762686 - 0.875309I$ $a = -1.44491 + 1.55956I$ $b = 0.70519 + 1.74288I$ $c = -2.02916 - 1.48909I$ $d = -1.190170 + 0.436468I$	$-7.89368 + 2.87937I$	$-10.41286 - 3.23335I$

Solutions to I_2^u	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.958422 + 0.661375I$ $a = -1.166710 - 0.533776I$ $b = -1.25478 - 0.98207I$ $c = 0.744407 + 0.405064I$ $d = 0.164345 + 0.807203I$	$-0.20533 + 5.20915I$	$-2.55774 - 3.72118I$
$u = 0.958422 + 0.661375I$ $a = 1.28394 + 0.64916I$ $b = 1.39078 + 2.09707I$ $c = 1.57823 - 0.38401I$ $d = 1.132380 - 0.485520I$	$-0.20533 + 5.20915I$	$-2.55774 - 3.72118I$
$u = 0.958422 - 0.661375I$ $a = -1.166710 + 0.533776I$ $b = -1.25478 + 0.98207I$ $c = 0.744407 - 0.405064I$ $d = 0.164345 - 0.807203I$	$-0.20533 - 5.20915I$	$-2.55774 + 3.72118I$
$u = 0.958422 - 0.661375I$ $a = 1.28394 - 0.64916I$ $b = 1.39078 - 2.09707I$ $c = 1.57823 + 0.38401I$ $d = 1.132380 + 0.485520I$	$-0.20533 - 5.20915I$	$-2.55774 + 3.72118I$
$u = -0.273627 + 1.210650I$ $a = 0.376337 + 1.232810I$ $b = -0.055892 - 0.873986I$ $c = -0.687715 - 0.784193I$ $d = -0.901383 + 0.672173I$	$8.10965 + 4.33574I$	$3.31243 - 3.68401I$
$u = -0.273627 + 1.210650I$ $a = -0.680000 - 0.179254I$ $b = 1.163320 + 0.588782I$ $c = 0.0243773 + 0.1172880I$ $d = -0.522674 - 0.802934I$	$8.10965 + 4.33574I$	$3.31243 - 3.68401I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = -0.273627 - 1.210650I$ $a = 0.376337 - 1.232810I$ $b = -0.055892 + 0.873986I$ $c = -0.687715 + 0.784193I$ $d = -0.901383 - 0.672173I$	$8.10965 - 4.33574I$	$3.31243 + 3.68401I$
$u = -0.273627 - 1.210650I$ $a = -0.680000 + 0.179254I$ $b = 1.163320 - 0.588782I$ $c = 0.0243773 - 0.1172880I$ $d = -0.522674 + 0.802934I$	$8.10965 - 4.33574I$	$3.31243 + 3.68401I$
$u = 0.764438 + 1.080520I$ $a = -0.29279 - 1.73056I$ $b = 1.42979 - 1.08893I$ $c = 0.371944 + 0.333066I$ $d = -0.163987 + 0.927905I$	$1.11929 - 11.51290I$	$-1.55919 + 7.44023I$
$u = 0.764438 + 1.080520I$ $a = 0.80955 + 1.63996I$ $b = -1.82005 + 1.63929I$ $c = -1.76532 + 1.05251I$ $d = -1.196120 - 0.553243I$	$1.11929 - 11.51290I$	$-1.55919 + 7.44023I$
$u = 0.764438 - 1.080520I$ $a = -0.29279 + 1.73056I$ $b = 1.42979 + 1.08893I$ $c = 0.371944 - 0.333066I$ $d = -0.163987 - 0.927905I$	$1.11929 + 11.51290I$	$-1.55919 - 7.44023I$
$u = 0.764438 - 1.080520I$ $a = 0.80955 - 1.63996I$ $b = -1.82005 - 1.63929I$ $c = -1.76532 - 1.05251I$ $d = -1.196120 + 0.553243I$	$1.11929 + 11.51290I$	$-1.55919 - 7.44023I$

Solutions to I_2^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.215541+0.601634I$ $a=\ \ 0.704776+0.667690I$ $b=\ \ 1.56963+1.15126I$ $c=\ \ 1.60686+0.07009I$ $d=\ \ 1.140500+0.089613I$	$-2.97495+0.92758I$	$-6.11605-7.40073I$
$u=-0.215541+0.601634I$ $a=-0.06827-2.46100I$ $b=-0.303895+0.345281I$ $c=\ \ 1.26996-3.35470I$ $d=-0.875845+0.206022I$	$-2.97495+0.92758I$	$-6.11605-7.40073I$
$u=-0.215541-0.601634I$ $a=\ \ 0.704776-0.667690I$ $b=\ \ 1.56963-1.15126I$ $c=\ \ 1.60686-0.07009I$ $d=\ \ 1.140500-0.089613I$	$-2.97495-0.92758I$	$-6.11605+7.40073I$
$u=-0.215541-0.601634I$ $a=-0.06827+2.46100I$ $b=-0.303895-0.345281I$ $c=\ \ 1.26996+3.35470I$ $d=-0.875845-0.206022I$	$-2.97495-0.92758I$	$-6.11605+7.40073I$

III. $I_3^u = \langle -u^7 - u^5 - 2u^3 + d - u,\ -u^7 - 2u^5 - 2u^3 + c - 2u,\ u^8 a + 25u^8 + \cdots - 28a + 13,\ -u^8 - 2u^7 + \cdots + a^2 + a,\ u^9 + u^8 + \cdots + u - 1\rangle$

(i) Arc colorings

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

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

$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$

$$a_{10} = \begin{pmatrix} u^7 + 2u^5 + 2u^3 + 2u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

$$a_{11} = \begin{pmatrix} u^5 + u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$

$$a_1 = \begin{pmatrix} a \\ -0.0322581au^8 - 0.806452u^8 + \cdots + 0.903226a - 0.419355 \end{pmatrix}$$

$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

$$a_2 = \begin{pmatrix} 0.225806au^8 - 0.354839u^8 + \cdots + 0.677419a - 0.0645161 \\ -0.225806au^8 - 1.64516u^8 + \cdots + 0.322581a - 0.935484 \end{pmatrix}$$

$$a_5 = \begin{pmatrix} -0.0322581au^8 - 0.806452u^8 + \cdots - 0.0967742a - 0.419355 \\ -0.0322581au^8 - 0.806452u^8 + \cdots + 0.903226a - 0.419355 \end{pmatrix}$$

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

$$a_6 = \begin{pmatrix} 0.451613au^8 + 1.29032u^8 + \cdots + 0.354839a + 0.870968 \\ 0.387097au^8 + 0.677419u^8 + \cdots - 0.838710a + 0.0322581 \end{pmatrix}$$

$$a_{12} = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^7 - 4u^6 - 4u^5 - 4u^4 - 8u^3 - 4u^2 - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$u^{18}+13u^{17}+\cdots+12u+1$
c_2, c_4, c_5 c_6, c_{12}	$u^{18}+u^{17}+\cdots-2u-1$
c_3, c_8	$(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)^2$
c_7, c_{10}	$(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)^2$
c_9	$(u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1)^2$
c_{11}	$(u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$y^{18} - 17y^{17} + \cdots - 156y + 1$
c_2, c_4, c_5 c_6, c_{12}	$y^{18} - 13y^{17} + \cdots - 12y + 1$
c_3, c_8	$(y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1)^2$
c_7, c_{10}	$(y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)^2$
c_9	$(y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1)^2$
c_{11}	$(y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.140343 + 0.966856I$ $a = -0.085582 + 0.757267I$ $b = 0.418870 + 0.086291I$ $c = -0.045155 + 1.125270I$ $d = -0.772920 - 0.510351I$	$1.78344 - 2.09337I$	$0.51499 + 4.16283I$
$u = 0.140343 + 0.966856I$ $a = -0.27999 - 2.96236I$ $b = 0.70313 + 1.42788I$ $c = -0.045155 + 1.125270I$ $d = -0.772920 - 0.510351I$	$1.78344 - 2.09337I$	$0.51499 + 4.16283I$
$u = 0.140343 - 0.966856I$ $a = -0.085582 - 0.757267I$ $b = 0.418870 - 0.086291I$ $c = -0.045155 - 1.125270I$ $d = -0.772920 + 0.510351I$	$1.78344 + 2.09337I$	$0.51499 - 4.16283I$
$u = 0.140343 - 0.966856I$ $a = -0.27999 + 2.96236I$ $b = 0.70313 - 1.42788I$ $c = -0.045155 - 1.125270I$ $d = -0.772920 + 0.510351I$	$1.78344 + 2.09337I$	$0.51499 - 4.16283I$
$u = 0.628449 + 0.875112I$ $a = -0.739935 - 0.923677I$ $b = -0.747999 - 1.130940I$ $c = 0.527060 + 0.163673I$ $d = -0.141484 + 0.739668I$	$-0.61694 - 2.45442I$	$-2.32792 + 2.91298I$
$u = 0.628449 + 0.875112I$ $a = -1.14609 - 1.92647I$ $b = 1.17043 - 0.94478I$ $c = 0.527060 + 0.163673I$ $d = -0.141484 + 0.739668I$	$-0.61694 - 2.45442I$	$-2.32792 + 2.91298I$

Solutions to I_3^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.628449 - 0.875112I$ $a = -0.739935 + 0.923677I$ $b = -0.747999 + 1.130940I$ $c = 0.527060 - 0.163673I$ $d = -0.141484 - 0.739668I$	$-0.61694 + 2.45442I$	$-2.32792 - 2.91298I$
$u = 0.628449 - 0.875112I$ $a = -1.14609 + 1.92647I$ $b = 1.17043 + 0.94478I$ $c = 0.527060 - 0.163673I$ $d = -0.141484 - 0.739668I$	$-0.61694 + 2.45442I$	$-2.32792 - 2.91298I$
$u = -0.796005 + 0.733148I$ $a = -0.978726 + 0.854864I$ $b = -0.42218 + 1.69219I$ $c = 1.61946 + 0.31131I$ $d = 1.173910 + 0.391555I$	$-4.37135 - 1.33617I$	$-7.28409 + 0.70175I$
$u = -0.796005 + 0.733148I$ $a = 1.47462 - 1.15398I$ $b = 1.71904 - 2.73838I$ $c = 1.61946 + 0.31131I$ $d = 1.173910 + 0.391555I$	$-4.37135 - 1.33617I$	$-7.28409 + 0.70175I$
$u = -0.796005 - 0.733148I$ $a = -0.978726 - 0.854864I$ $b = -0.42218 - 1.69219I$ $c = 1.61946 - 0.31131I$ $d = 1.173910 - 0.391555I$	$-4.37135 + 1.33617I$	$-7.28409 - 0.70175I$
$u = -0.796005 - 0.733148I$ $a = 1.47462 + 1.15398I$ $b = 1.71904 + 2.73838I$ $c = 1.61946 - 0.31131I$ $d = 1.173910 - 0.391555I$	$-4.37135 + 1.33617I$	$-7.28409 - 0.70175I$

Solutions to I_3^u	$\sqrt{-1}(\text{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.728966+0.986295I$ $a=-0.78241+1.38542I$ $b=\ \ 1.05246+1.54480I$ $c=-1.78816-1.28587I$ $d=-1.172470+0.500383I$	$-3.59813+7.08493I$	$-5.57680-5.91335I$
$u=-0.728966+0.986295I$ $a=\ \ 1.68173-1.92006I$ $b=-1.66387-1.99378I$ $c=-1.78816-1.28587I$ $d=-1.172470+0.500383I$	$-3.59813+7.08493I$	$-5.57680-5.91335I$
$u=-0.728966-0.986295I$ $a=-0.78241-1.38542I$ $b=\ \ 1.05246-1.54480I$ $c=-1.78816+1.28587I$ $d=-1.172470-0.500383I$	$-3.59813-7.08493I$	$-5.57680+5.91335I$
$u=-0.728966-0.986295I$ $a=\ \ 1.68173+1.92006I$ $b=-1.66387+1.99378I$ $c=-1.78816+1.28587I$ $d=-1.172470-0.500383I$	$-3.59813-7.08493I$	$-5.57680+5.91335I$
$u=\ \ 0.512358$ $a=\ \ 0.516084$ $b=\ \ 0.492057$ $c=\ \ 1.37360$ $d=\ \ 0.825933$	-1.19845	-8.65230
$u=\ \ 0.512358$ $a=-2.80331$ $b=-5.95180$ $c=\ \ 1.37360$ $d=\ \ 0.825933$	-1.19845	-8.65230

IV. $\boldsymbol{I^u_4 = \langle u^8c + 5u^8 + \cdots - 27c + 10,\ 2u^8c - 2u^8 + \cdots + 2c - 4,\ -u^2 + b,\ -u^2 + a - 1,\ u^9 + u^8 + \cdots + u - 1\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} c \\ -0.0344828cu^8 - 0.172414u^8 + \cdots + 0.931034c - 0.344828 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} 0.0344828cu^8 + 0.172414u^8 + \cdots + 0.0689655c + 0.344828 \\ -0.0344828cu^8 - 0.172414u^8 + \cdots + 0.931034c - 0.344828 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^6 + u^4 + 2u^2 + 1 \\ u^8 + 2u^6 + 2u^4 + 2u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^4 - u^2 - 1 \\ -u^4 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -0.172414cu^8 + 0.137931u^8 + \cdots - 0.344828c + 0.275862 \\ -0.206897cu^8 - 0.0344828u^8 + \cdots - 0.413793c - 0.0689655 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} 0.0344828cu^8 + 0.172414u^8 + \cdots + 0.0689655c + 0.344828 \\ 0.0344828cu^8 + 0.172414u^8 + \cdots - 0.931034c + 0.344828 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -0.758621cu^8 + 0.206897u^8 + \cdots + 1.48276c - 0.586207 \\ -0.586207cu^8 + 0.0689655u^8 + \cdots + 1.82759c - 0.862069 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^7 - 4u^6 - 4u^5 - 4u^4 - 8u^3 - 4u^2 - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1	$(u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1)^2$
c_2, c_4	$(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)^2$
c_3, c_8	$(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)^2$
c_5, c_6, c_7 c_{10}, c_{12}	$u^{18}+u^{17}+\cdots-2u-1$
c_9	$u^{18}+13u^{17}+\cdots+12u+1$
c_{11}	$(u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1)^2$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1	$(y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1)^2$
c_2, c_4	$(y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)^2$
c_3, c_8	$(y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1)^2$
c_5, c_6, c_7 c_{10}, c_{12}	$y^{18} - 13y^{17} + \cdots - 12y + 1$
c_9	$y^{18} - 17y^{17} + \cdots - 156y + 1$
c_{11}	$(y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1)^2$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.140343 + 0.966856I$ $a = 0.084886 + 0.271383I$ $b = -0.915114 + 0.271383I$ $c = 0.312641 - 0.476170I$ $d = -0.535620 + 0.576021I$	$1.78344 - 2.09337I$	$0.51499 + 4.16283I$
$u = 0.140343 + 0.966856I$ $a = 0.084886 + 0.271383I$ $b = -0.915114 + 0.271383I$ $c = 1.74136 - 0.05336I$ $d = 1.308540 - 0.065670I$	$1.78344 - 2.09337I$	$0.51499 + 4.16283I$
$u = 0.140343 - 0.966856I$ $a = 0.084886 - 0.271383I$ $b = -0.915114 - 0.271383I$ $c = 0.312641 + 0.476170I$ $d = -0.535620 - 0.576021I$	$1.78344 + 2.09337I$	$0.51499 - 4.16283I$
$u = 0.140343 - 0.966856I$ $a = 0.084886 - 0.271383I$ $b = -0.915114 - 0.271383I$ $c = 1.74136 + 0.05336I$ $d = 1.308540 + 0.065670I$	$1.78344 + 2.09337I$	$0.51499 - 4.16283I$
$u = 0.628449 + 0.875112I$ $a = 0.629127 + 1.099930I$ $b = -0.370873 + 1.099930I$ $c = 1.68962 - 0.24481I$ $d = 1.253840 - 0.303492I$	$-0.61694 - 2.45442I$	$-2.32792 + 2.91298I$
$u = 0.628449 + 0.875112I$ $a = 0.629127 + 1.099930I$ $b = -0.370873 + 1.099930I$ $c = -1.66618 + 1.71382I$ $d = -1.112360 - 0.436175I$	$-0.61694 - 2.45442I$	$-2.32792 + 2.91298I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = 0.628449 - 0.875112I$ $a = 0.629127 - 1.099930I$ $b = -0.370873 - 1.099930I$ $c = 1.68962 + 0.24481I$ $d = 1.253840 + 0.303492I$	$-0.61694 + 2.45442I$	$-2.32792 - 2.91298I$
$u = 0.628449 - 0.875112I$ $a = 0.629127 - 1.099930I$ $b = -0.370873 - 1.099930I$ $c = -1.66618 - 1.71382I$ $d = -1.112360 + 0.436175I$	$-0.61694 + 2.45442I$	$-2.32792 - 2.91298I$
$u = -0.796005 + 0.733148I$ $a = 1.09612 - 1.16718I$ $b = 0.096118 - 1.167180I$ $c = 0.669579 - 0.290859I$ $d = 0.035822 - 0.749326I$	$-4.37135 - 1.33617I$	$-7.28409 + 0.70175I$
$u = -0.796005 + 0.733148I$ $a = 1.09612 - 1.16718I$ $b = 0.096118 - 1.167180I$ $c = -2.42920 - 1.72243I$ $d = -1.209730 + 0.357771I$	$-4.37135 - 1.33617I$	$-7.28409 + 0.70175I$
$u = -0.796005 - 0.733148I$ $a = 1.09612 + 1.16718I$ $b = 0.096118 + 1.167180I$ $c = 0.669579 + 0.290859I$ $d = 0.035822 + 0.749326I$	$-4.37135 + 1.33617I$	$-7.28409 - 0.70175I$
$u = -0.796005 - 0.733148I$ $a = 1.09612 + 1.16718I$ $b = 0.096118 + 1.167180I$ $c = -2.42920 + 1.72243I$ $d = -1.209730 - 0.357771I$	$-4.37135 + 1.33617I$	$-7.28409 - 0.70175I$

Solutions to I_4^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u=-0.728966+0.986295I$ $a=\ \ 0.55861-1.43795I$ $b=-0.44139-1.43795I$ $c=\ \ 0.444675-0.276867I$ $d=-0.138557-0.857281I$	$-3.59813+7.08493I$	$-5.57680-5.91335I$
$u=-0.728966+0.986295I$ $a=\ \ 0.55861-1.43795I$ $b=-0.44139-1.43795I$ $c=\ \ 1.73366+0.29163I$ $d=\ \ 1.311030+0.356898I$	$-3.59813+7.08493I$	$-5.57680-5.91335I$
$u=-0.728966-0.986295I$ $a=\ \ 0.55861+1.43795I$ $b=-0.44139+1.43795I$ $c=\ \ 0.444675+0.276867I$ $d=-0.138557+0.857281I$	$-3.59813-7.08493I$	$-5.57680+5.91335I$
$u=-0.728966-0.986295I$ $a=\ \ 0.55861+1.43795I$ $b=-0.44139+1.43795I$ $c=\ \ 1.73366-0.29163I$ $d=\ \ 1.311030-0.356898I$	$-3.59813-7.08493I$	$-5.57680+5.91335I$
$u=\ \ 0.512358$ $a=\ \ 1.26251$ $b=\ \ 0.262511$ $c=\ \ 1.06355$ $d=\ \ 0.285873$	-1.19845	-8.65230
$u=\ \ 0.512358$ $a=\ \ 1.26251$ $b=\ \ 0.262511$ $c=-10.0559$ $d=-1.11181$	-1.19845	-8.65230

V. $\boldsymbol{I_5^u = \langle -u^7 - u^5 - 2u^3 + d - u,\ -u^7 - 2u^5 - 2u^3 + c - 2u,\ -u^2 + b,\ -u^2 + a - 1,\ u^9 + u^8 + \cdots + u - 1\rangle}$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 0 \\ u \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ u^2 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} u^7 + 2u^5 + 2u^3 + 2u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} u^5 + u \\ u^7 + u^5 + 2u^3 + u \end{pmatrix}$$
$$a_1 = \begin{pmatrix} u^2 + 1 \\ u^2 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$
$$a_2 = \begin{pmatrix} u^6 + u^4 + 2u^2 + 1 \\ u^8 + 2u^6 + 2u^4 + 2u^2 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -u^4 - u^2 - 1 \\ -u^4 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} -u^3 \\ -u^5 - u^3 - u \end{pmatrix}$$
$$a_6 = \begin{pmatrix} -u^8 - u^6 - u^4 + 1 \\ -u^8 - u^7 - u^6 - 2u^5 - u^4 - 2u^3 - 2u + 1 \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} u \\ u^3 + u \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= -4u^7 - 4u^6 - 4u^5 - 4u^4 - 8u^3 - 4u^2 - 6$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_9	$u^9 + 5u^8 + 12u^7 + 15u^6 + 9u^5 - u^4 - 4u^3 - 2u^2 + u + 1$
c_2, c_4, c_5 c_6, c_7, c_{10} c_{12}	$u^9 - u^8 - 2u^7 + 3u^6 + u^5 - 3u^4 + 2u^3 - u + 1$
c_3, c_8	$u^9 - u^8 + 2u^7 - u^6 + 3u^5 - u^4 + 2u^3 + u + 1$
c_{11}	$u^9 - 3u^8 + 8u^7 - 13u^6 + 17u^5 - 17u^4 + 12u^3 - 6u^2 + u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1$
c_2, c_4, c_5 c_6, c_7, c_{10} c_{12}	$y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1$
c_3, c_8	$y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1$
c_{11}	$y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol}+\sqrt{-1}CS)$	Cusp shape
$u = 0.140343 + 0.966856I$ $a = 0.084886 + 0.271383I$ $b = -0.915114 + 0.271383I$ $c = -0.045155 + 1.125270I$ $d = -0.772920 - 0.510351I$	$1.78344 - 2.09337I$	$0.51499 + 4.16283I$
$u = 0.140343 - 0.966856I$ $a = 0.084886 - 0.271383I$ $b = -0.915114 - 0.271383I$ $c = -0.045155 - 1.125270I$ $d = -0.772920 + 0.510351I$	$1.78344 + 2.09337I$	$0.51499 - 4.16283I$
$u = 0.628449 + 0.875112I$ $a = 0.629127 + 1.099930I$ $b = -0.370873 + 1.099930I$ $c = 0.527060 + 0.163673I$ $d = -0.141484 + 0.739668I$	$-0.61694 - 2.45442I$	$-2.32792 + 2.91298I$
$u = 0.628449 - 0.875112I$ $a = 0.629127 - 1.099930I$ $b = -0.370873 - 1.099930I$ $c = 0.527060 - 0.163673I$ $d = -0.141484 - 0.739668I$	$-0.61694 + 2.45442I$	$-2.32792 - 2.91298I$
$u = -0.796005 + 0.733148I$ $a = 1.09612 - 1.16718I$ $b = 0.096118 - 1.167180I$ $c = 1.61946 + 0.31131I$ $d = 1.173910 + 0.391555I$	$-4.37135 - 1.33617I$	$-7.28409 + 0.70175I$
$u = -0.796005 - 0.733148I$ $a = 1.09612 + 1.16718I$ $b = 0.096118 + 1.167180I$ $c = 1.61946 - 0.31131I$ $d = 1.173910 - 0.391555I$	$-4.37135 + 1.33617I$	$-7.28409 - 0.70175I$

Solutions to I_5^u	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$u = -0.728966 + 0.986295I$ $a = 0.55861 - 1.43795I$ $b = -0.44139 - 1.43795I$ $c = -1.78816 - 1.28587I$ $d = -1.172470 + 0.500383I$	$-3.59813 + 7.08493I$	$-5.57680 - 5.91335I$
$u = -0.728966 - 0.986295I$ $a = 0.55861 + 1.43795I$ $b = -0.44139 + 1.43795I$ $c = -1.78816 + 1.28587I$ $d = -1.172470 - 0.500383I$	$-3.59813 - 7.08493I$	$-5.57680 + 5.91335I$
$u = 0.512358$ $a = 1.26251$ $b = 0.262511$ $c = 1.37360$ $d = 0.825933$	-1.19845	-8.65230

VI. $I_1^v = \langle a,\ d-1,\ c-a-1,\ b-1,\ v+1 \rangle$

(i) Arc colorings

$a_4 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$

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

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

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

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

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

$a_3 = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$

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

$a_5 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$

$a_7 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$

$a_6 = \begin{pmatrix} 0 \\ -1 \end{pmatrix}$

$a_{12} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= -12$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_7 c_9	$u-1$
c_3, c_5, c_6 c_8, c_{11}, c_{12}	u
c_4, c_{10}	$u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_7, c_9, c_{10}	$y-1$
c_3, c_5, c_6 c_8, c_{11}, c_{12}	y

(vi) Complex Volumes and Cusp Shapes

Solutions to I_1^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = -1.00000$ $a = 0$ $b = 1.00000$ $c = 1.00000$ $d = 1.00000$	-3.28987	-12.0000

VII. $I_2^v = \langle a,\ d,\ c-1,\ b+1,\ v-1 \rangle$

(i) Arc colorings

$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

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

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

$a_{10} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

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

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

$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

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

$a_5 = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

$a_7 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

$a_6 = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$

$a_{12} = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_{12}	$u-1$
c_3, c_7, c_8 c_9, c_{10}, c_{11}	u
c_4, c_5, c_6	$u+1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_4 c_5, c_6, c_{12}	$y-1$
c_3, c_7, c_8 c_9, c_{10}, c_{11}	y

(vi) Complex Volumes and Cusp Shapes

Solutions to I_2^v	$\sqrt{-1}(\text{vol} + \sqrt{-1}CS)$	Cusp shape
$v = 1.00000$		
$a = 0$		
$b = -1.00000$	0	0
$c = 1.00000$		
$d = 0$		

VIII. $I_3^v = \langle c,\ d-1,\ b,\ a-1,\ v-1 \rangle$

(i) Arc colorings

$$a_4 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

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

$$a_{10} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

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

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

$$a_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

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

$$a_5 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$

$$a_7 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$

$$a_6 = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$$

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

(ii) Obstruction class $= 1$

(iii) Cusp Shapes $= 0$

(iv) u-Polynomials at the component

Crossings	u-Polynomials at each crossing
c_1, c_2, c_3 c_4, c_8, c_{11}	u
c_5, c_6, c_7 c_9	$u - 1$
c_{10}, c_{12}	$u + 1$

(v) Riley Polynomials at the component

Crossings	Riley Polynomials at each crossing
c_1, c_2, c_3 c_4, c_8, c_{11}	y
c_5, c_6, c_7 c_9, c_{10}, c_{12}	$y - 1$

(vi) Complex Volumes and Cusp Shapes

Solutions to I_3^v		$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v =$	1.00000		
$a =$	1.00000		
$b =$	0	0	0
$c =$	0		
$d =$	1.00000		

IX. $I_4^v = \langle c,\ d-1,\ av+c-v-1,\ bv+1 \rangle$

(i) Arc colorings

$$a_4 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_8 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_9 = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$$
$$a_{10} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$
$$a_{11} = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$
$$a_1 = \begin{pmatrix} a \\ -a+1 \end{pmatrix}$$
$$a_3 = \begin{pmatrix} v \\ 0 \end{pmatrix}$$
$$a_2 = \begin{pmatrix} a+v \\ -a+1 \end{pmatrix}$$
$$a_5 = \begin{pmatrix} -a \\ a-1 \end{pmatrix}$$
$$a_7 = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$$
$$a_6 = \begin{pmatrix} a+1 \\ -a \end{pmatrix}$$
$$a_{12} = \begin{pmatrix} -1 \\ 1 \end{pmatrix}$$

(ii) Obstruction class $= -1$

(iii) Cusp Shapes $= a^2 + v^2 - 2a - 7$

(iv) u-Polynomials at the component : It cannot be defined for a positive dimension component.

(v) Riley Polynomials at the component : It cannot be defined for a positive dimension component.

(iv) Complex Volumes and Cusp Shapes

Solution to I_4^v	$\sqrt{-1}(\mathrm{vol} + \sqrt{-1}CS)$	Cusp shape
$v = \cdots$		
$a = \cdots$		
$b = \cdots$	-1.64493	$-6.78092 + 0.05196I$
$c = \cdots$		
$d = \cdots$		

X. u-Polynomials

Crossings	u-Polynomials at each crossing
c_1, c_9	$u(u-1)^2(u^9+5u^8+12u^7+15u^6+9u^5-u^4-4u^3-2u^2+u+1)^3$ $\cdot(u^{18}+13u^{17}+\cdots+12u+1)(u^{22}+11u^{21}+\cdots+40u+16)$ $\cdot(u^{25}+12u^{24}+\cdots+3u+1)$
c_2, c_7	$u(u-1)^2(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)^3$ $\cdot(u^{18}+u^{17}+\cdots-2u-1)(u^{22}-u^{21}+\cdots-4u+4)$ $\cdot(u^{25}-2u^{24}+\cdots-u+1)$
c_3, c_8	$u^3(u^9-u^8+2u^7-u^6+3u^5-u^4+2u^3+u+1)^5$ $\cdot(u^{11}+3u^{10}+6u^9+7u^8+7u^7+3u^6-2u^5-8u^4-7u^3-5u^2-2u-2)^2$ $\cdot(u^{25}-2u^{24}+\cdots-16u+8)$
c_4, c_{10}	$u(u+1)^2(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)^3$ $\cdot(u^{18}+u^{17}+\cdots-2u-1)(u^{22}-u^{21}+\cdots-4u+4)$ $\cdot(u^{25}-2u^{24}+\cdots-u+1)$
c_5, c_6, c_{12}	$u(u-1)(u+1)(u^9-u^8-2u^7+3u^6+u^5-3u^4+2u^3-u+1)$ $\cdot(u^{11}+u^{10}-5u^9-4u^8+9u^7+4u^6-5u^5+3u^4-3u^3-5u^2+3u-1)^2$ $\cdot((u^{18}+u^{17}+\cdots-2u-1)^2)(u^{25}+2u^{24}+\cdots+8u+4)$
c_{11}	$u^3(u^9-3u^8+8u^7-13u^6+17u^5-17u^4+12u^3-6u^2+u+1)^5$ $\cdot((u^{11}-3u^{10}+\cdots-16u+4)^2)(u^{25}-6u^{24}+\cdots+64u+64)$

XI. Riley Polynomials

Crossings	Riley Polynomials at each crossing
c_1, c_9	$y(y-1)^2(y^9 - y^8 + 12y^7 - 7y^6 + 37y^5 + y^4 - 10y^2 + 5y - 1)^3$ $\cdot (y^{18} - 17y^{17} + \cdots - 156y + 1)(y^{22} - 3y^{21} + \cdots - 544y + 256)$ $\cdot (y^{25} + 8y^{24} + \cdots - 13y - 1)$
c_2, c_4, c_7 c_{10}	$y(y-1)^2(y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)^3$ $\cdot (y^{18} - 13y^{17} + \cdots - 12y + 1)(y^{22} - 11y^{21} + \cdots - 40y + 16)$ $\cdot (y^{25} - 12y^{24} + \cdots + 3y - 1)$
c_3, c_8	$y^3(y^9 + 3y^8 + 8y^7 + 13y^6 + 17y^5 + 17y^4 + 12y^3 + 6y^2 + y - 1)^5$ $\cdot ((y^{11} + 3y^{10} + \cdots - 16y - 4)^2)(y^{25} + 6y^{24} + \cdots + 64y - 64)$
c_5, c_6, c_{12}	$y(y-1)^2(y^9 - 5y^8 + 12y^7 - 15y^6 + 9y^5 + y^4 - 4y^3 + 2y^2 + y - 1)$ $\cdot ((y^{11} - 11y^{10} + \cdots - y - 1)^2)(y^{18} - 13y^{17} + \cdots - 12y + 1)^2$ $\cdot (y^{25} - 22y^{24} + \cdots + 88y - 16)$
c_{11}	$y^3(y^9 + 7y^8 + 20y^7 + 25y^6 + 5y^5 - 15y^4 + 22y^2 + 13y - 1)^5$ $\cdot ((y^{11} + 7y^{10} + \cdots + 24y - 16)^2)(y^{25} + 14y^{24} + \cdots + 43008y - 4096)$